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A Comparison of Multi-Attribute Utility Theory, the Analytic Hierarchy Process, the Analytic Network Process, and New Hybrid Approaches for a Case Study Involving Radon

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A COMPARISON OF MULTI-ATTRIBUTE UTILITY THEORY, THE ANALYTIC HIERARCHY PROCESS, THE ANALYTIC NETWORK PROCESS, AND NEW HYBRID APPROACHES FOR A CASE STUDY INVOLVING RADON

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ABSTRACT

A COMPARISON OF MULTI-ATTRIBUTE UTILITY THEORY, THE ANALYTIC HIERARCHY PROCESS, THE ANALYTIC NETWORK PROCESS, AND NEW HYBRID APPROACHES FOR A CASE STUDY INVOLVING RADON

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Old Dominion University, 2019
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This dissertation focuses on the use of three new combinational hybrid approaches to solve a rational decision problem. Even though Multi-Attribute Utility Theory (MAUT) and the Analytic Hierarchy Process (AHP), and the Analytic Network Process (ANP), are all long-established theories, their practical applications continue to grow and generate new knowledge. As a case study approach, there exists a knowledge gap concerning the use of these MCDM methods in the area of environmental remediation, and more especially, in situations that involve radioactive materials. From this, and as borne out by the literature review discussed herein, a *problem statement* is thus affirmed: This dissertation analyzes how the MAUT, AHP, and ANP can be used, both individually and as combinational hybrid approaches, in terms of a case study involving the selection of a geographically appropriate location indicative of the relative natural background value for radon [in air] at a known environmental remediation site for which many volumes of information are publicly available. More broadly, this dissertation seeks to interpret how the practical application of MAUT, AHP, and ANP, both individually and as combinational hybrid approaches, can assist decision-makers in making related decisions at environmental sites, especially those that involve radioactive materials.

Comparison of MAUT, AHP, ANP, and testing of the three combinational hybrid approaches is accomplished by analyzing the same decision problem via each method. From this, similarities and differences between the outcomes of each model (*i.e.,* the results) are analyzed,

along with further comparisons drawn between the MAUT weighting factors and AHP / ANP priority vectors for each rendition. Still yet, very granular comparisons are made between the basic MAUT marginal utility values and the AHP / ANP alternative-level priority vectors.

One case study is likely insufficient to prove the utility of the three combinational hybrid approaches that are herein advocated. More case studies are encouraged to assess the true utility of these approaches. While hybrid MCDM approaches are nothing new, this research is original and unique and serves to add to the compendium of knowledge done by others, strengthening and bolstering the use of such approaches in engineering management and beyond.

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- My two adorable daughters, Olivia and Emma, whom I love very, very much.
- My advisor, Dr. Charlie Daniels, who has guided me in my academic pursuits for nearly a decade.
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LIST OF ACRONYMS AND ABBREVIATIONS

α—Lower case Greek letter *alpha*. Used in this dissertation to refer to a form of radiation *or* a subatomic particle *or* a mode of radioactive decay.

a fortiori— [Latin: "from a/the stronger [thing]"] used as an adverbial phrase to denote the strength of a secondary argument or clause by resting it on the superior strength of a primary argument or clause.

ACD—Average Number of Calm Days

ad hoc—[Latin: "for this"] used to denote something custom and/or non-generalizable.

AEA—Atomic Energy Act

AERMOD—American Meteorological Society/EPA Regulatory Model

a.k.a.—Also Known As

ALARA—As Low As Reasonably Achievable

AHP—[the] Analytic Hierarchy Process.

ANP—[the] Analytic Network Process.

ASEM—American Society of Engineering Management

AVWD—Average Number of Very Windy Days

AWD—Average Number of Windy Days

β—Lower case Greek letter *beta.* Used in this dissertation to refer to a form of radiation *or* a subatomic particle *or* a mode of radioactive decay.

BSC—Balanced Scorecard

BEIR—Biological Effects of Ionizing Radiation

Bi—Bismuth

C—Concentration

Cat—Category

CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act (a.k.a., "Superfund")

caeteris paribus—[Latin: "all other things being equal"]

CFR—Code of Federal Regulations

CI—Consistency Index

Ci—Curie

COC—Constituent of Concern, *also* Contaminant of Concern

Cont'd—Continued

COPC—Constituent of Potential Concern, *also* Contaminant of Potential Concern

CR—Consistency Ratio

d—Day

DA—Decision Analysis

DAS—Distance from Known Anthropogenic Source

DECERNS—Decision Evaluation for Complex Environmental Risk Network Systems

det—Determinant [of a matrix]

DNA—Deoxyribonucleic Acid

DNS—Distance from Known Natural Source

DOD—[United States] Department of Defense

DSS—Decision Support Software

e^{-}—Electron [subatomic particle]

e.g., —Exempli gratia [Latin: "for the sake of an example"]

Elev.—Elevation

EMV—Expected Monetary Value

EPA—[United States] Environmental Protection Agency

esp.—Especially

et al.—Et alii [Latin: "and others"]

etc.—Et cetera [Latin: "and other similar things"]

et seq.—Et sequentia [Latin: "and the words and other similar things following…"]

EUT—Expected Utility Theory

EV—Expected Value

eV—Electron Volt

Exp.—Exposure

Fig.—Figure

Figs.—Figures

γ—Lower case Greek letter *gamma.* Used in this dissertation to refer to a form of radiation *or* subatomic quanta of energy; spoken as *gamma* but sometimes referred to as a *photon or quanta* of *photons*, *esp.* when referenced in the context of subatomic particles, even though γs are massless, and therefore, not technically particles.

GRA—Grey Relational Analysis

GT—Game Theory

GW—Groundwater

HPS—Health Physics Society

ID—Identification

i.e.,—Id est [Latin: "in other words" *or* "that is to say"]

IRB—Institutional Review Board

IQR—Interquartile Range

λ—Lower case Greek letter *lambda.* Used in this dissertation to denote [the] Eigenvalue of a matrix, and should not to be confused with the various usages of "λ" below, which have different meanings; contextual clues will clarify the usage and meaning in this dissertation.

$\bar{\lambda}$— Lower case Greek letter *lambda* with vinculum. Used in this dissertation to denote [the] complex conjugate eigenvalue of a matrix; (often spoken as *Lambda Bar*).

λ *or* $t_{½}$—Half-life (of a radioactive isotope)

λ_{max}—[the] Principal eigenvalue of a matrix; (often spoken as *Lambda Max*), and sometimes alternatively referred to as the *dominant* or *maximum* eigenvalue.

$\bar{\lambda}_{max}$—[the] Complex conjugate principal eigenvalue of a matrix; (often spoken as *Lambda Max Bar*).

L. *or* **Loc.**—Location

Lat.—Latitude

Long.—Longitude

LTP—Large Tailings Pile

LTRC—Lifetime Risk of Cancer

μ—Lower case Greek letter *mu*. Used in this dissertation to indicate the statistical average of a population, not to be confused with the usage of "μ" below, which has a different meaning; contextual clues will clarify the usage and meaning in this dissertation.

μ—Lower case Greek letter *mu*. Used as the prefix *micro* in the SI system of measurement.

m—Meter, not to be confused with the usage of "m" below, which has a different meaning; contextual clues will clarify the usage and meaning in this dissertation.

m—Month

MACBETH—Measuring Attractiveness by a Categorical Based Evaluation Technique

MAUT—Multi-Attribute Utility Theory

MAVT— Multi-Attribute Value Theory

MCDA—Multiple Criteria Decision Analysis

MCDM—Multiple Criteria Decision Making

MCL—Maximum Concentration Limit

Meas.—Measurement *or* Measured

MeV—Mega Electron Volt (*i.e.,* one million electron volts)

MF—Membership Function

mrem—Millirem (*i.e.,* one thousandth of a rem)

MSL—[above] Mean Sea Level

MU—Marginal Utility

MV—Monetary Value

ν—Lower case Greek letter *nu*. Used in this dissertation to denote [the] Eigenvector of a matrix. *ν* should not be confused with "*v*." below (note the period (**.**) after the "*v*"), which looks similar to the Greek letter *nu* but is actually an italicized Roman letter "v", and is the Latin abbreviation for "versus." Contextual clues will clarify the usage and meaning in this dissertation.

n—[the] Number representing the dimensional length *or* width (*i.e.,* number of rows *or* columns) of a square matrix; not to be confused with the usage of "*n*" below, which has a different meaning; contextual clues will clarify the usage and meaning in this dissertation.

n—Speed

n^0—Neutron [can refer to: radiation *or* a subatomic particle].

NAD—North American Datum

NCRP—National Council on Radiation Protection

NRC—[United States] Nuclear Regulatory Commission

ODU—Old Dominion University

OR—Operations Research

p^+—Proton [subatomic particle]

Pb—Lead

pCi—PicoCurie (*i.e.,* one trillionth of a Curie)

Po—Polonium

PROMETHEE—[the] Preference Ranking Organization Method

PRP—Potentially Responsible Party

PV—Priority Vector

QA—Quality Assurance

QC—Quality Control

Ra—Radium

RAD *or* **rad**—Radiation Absorbed Dose

RDM—Rational Decision Making

RDP—Radon Decay Product; sometimes referred to as *radon daughter(s)*, *esp.* in older texts.

REM *or* **rem**—Roentgens Equivalent in Man

Rn—Radon

RSO—Radiation Safety Officer

Σ—Upper case Greek letter *sigma*. Used in this dissertation to indicate summation.

σ—Lower case Greek letter *sigma*. Used in this dissertation to indicate the statistical standard deviation of a population.

s—Second

SARA—Superfund Amendments and Reauthorization Act

SF—Spontaneous Fission

SGD—Submarine Groundwater Discharge

SI—*Système International (d'unités)* [French: the international system of units]

sic—Usually found in brackets as [*sic*]. [Latin: "thus"]. The use of [*sic*] in this dissertation is in keeping with standard style usage, and is meant to draw attention to a typo or some other real or apparent anomaly in a quotation but to indicate that the quotation is being represented verbatim as it originally appeared in the source document.

SLTO—Social License to Operate

SPCS—State Plane Coordinate System

STP—Standard Atmospheric Temperature and Pressure

Temp—Temperature

Th—Thorium

TSK—Tagaki-Sugeno Kank [structuring for fuzzy set logic]

U—Uranium

U.S. *or* **US**—United States

UMTRCA—Uranium Mill Tailings Radiation Control Act

UNSCEAR—United Nations Scientific Committee on the Effects of Atomic Radiation

UT—Utility Theory

UV—Ultraviolet [radiation]

v.—versus [Latin: “in contrast to” *or* “as opposed to”]

W.—Wind *or* Windward

W.E.—Windward Exposure

WMU—Weighted Marginal Utility

WS—Weighted Sum

y—Year

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CHAPTER 1

INTRODUCTION

1.1. Problem Statement – Up Front

This dissertation focuses on the use of three new combinational hybrid approaches to solve a rational decision problem. Multi-Attribute Utility Theory (MAUT), the Analytic Hierarchy Process (AHP), and the Analytic Network Process (ANP) are combined to support a rational decision-making problem involving radon. The topic of the dissertation is concentrated in a case study involving the decision-making process to select a geographically appropriate location indicative of the relative natural background value for radon [in air]. Additionally, and more broadly, this dissertation seeks to interpret how the practical application of MAUT and ANP, both individually and combined as integrated approaches, can assist decision-makers in making related decisions at environmental sites, especially those that involve radioactive materials.

1.2. Format of Dissertation

Although it might not be apparent, a concerted effort was in fact made to present the research material in simplified terms, and to avoid writing a paper chocked full of math formulas and technical jargon only comprehensible to a few. Be that as it may, this dissertation relies on several seemingly disjointed pieces to come together in a specific way. Proper framing of the problem statement, purpose, objectives, null hypotheses, and research limitations necessitates a coalescence of various disciplines and concepts, including:

1. Engineering Management;
2. MCDM, MAUT, ANP, AHP, Rational Decision Making (RDM), Multi-Criteria Decision Analysis (MCDA), and MCDA software programs;

3. Higher level math (*e.g.,* matrix algebra, calculus, linear equations, *etc.*);
4. Regulatory guidance applicable to environmental sites;
5. Environmental remediation; and
6. Radon, radon background, and radiation.

Accordingly, it seems prudent to offer an introductory explanation as to how this dissertation is laid out, so as make it easier for a reader to become aware of the overall big picture, before delving into what would otherwise seem to be the frayed ends of sporadic thoughts. Figure 1 below illustrates the general format and logical progression of this dissertation while Figure 2 illustrates the logical progression associated with the development of the scope and boundaries of the research.

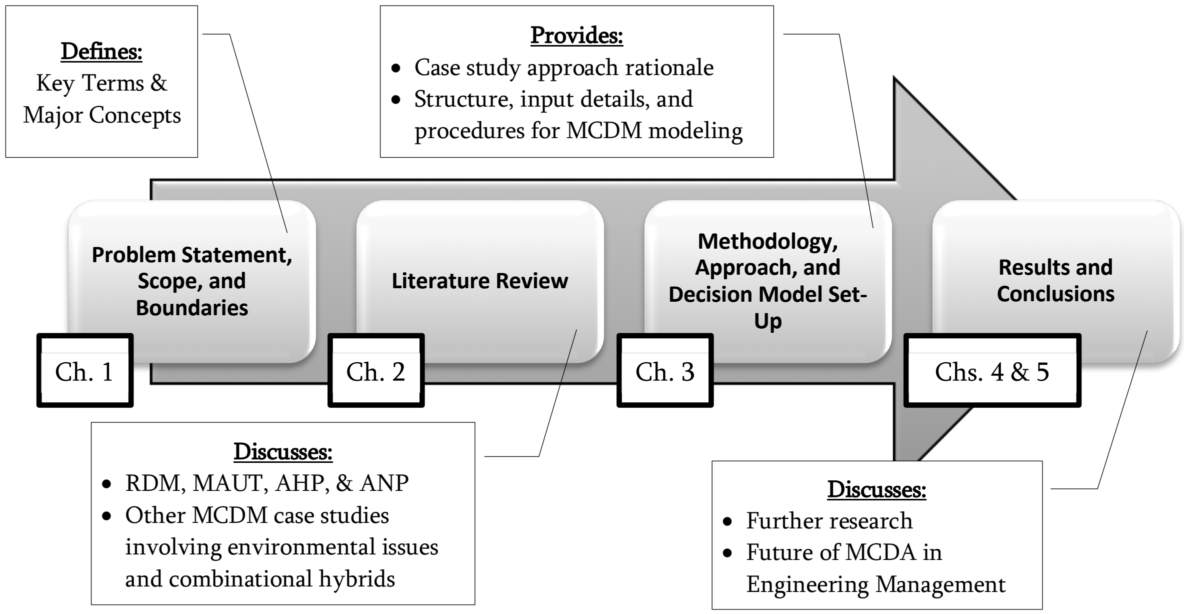

Figure 1. Organizational Format of Dissertation.

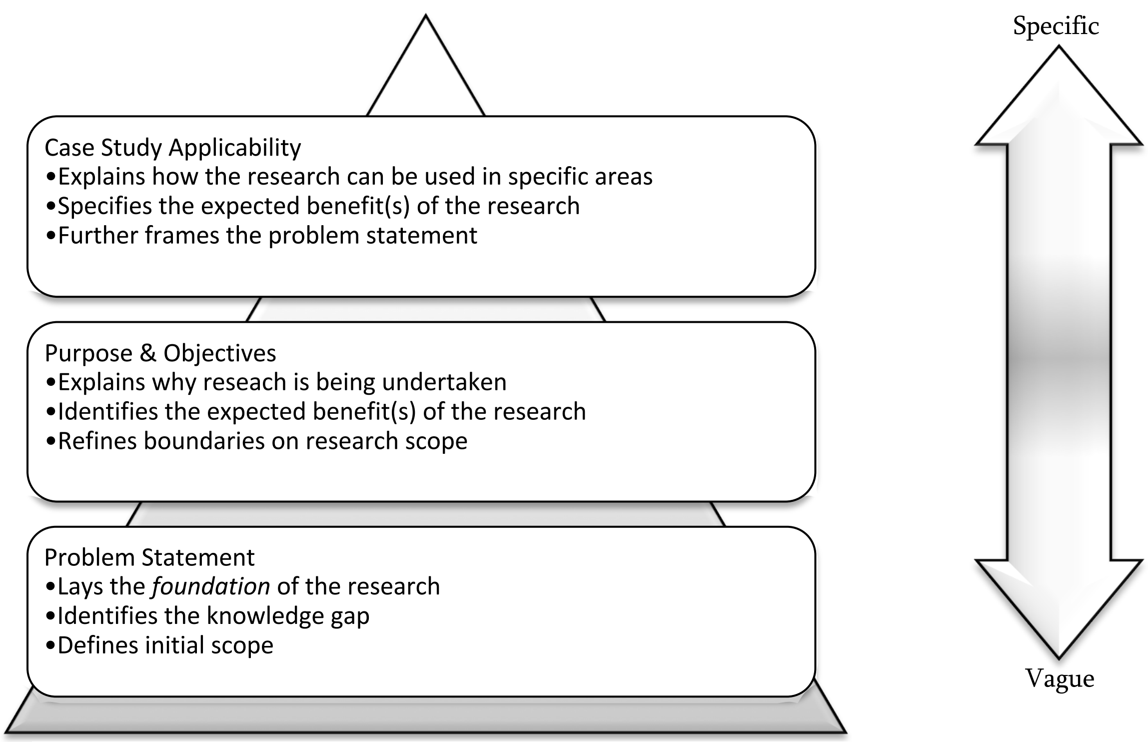

Figure 2. Identifying, Defining, and Refining Research Scope and Boundaries.

As shown in Figure 2, the problem statement is the heart of the entire research project; the point of giving the problem statement is to explain what the research is about, and how it will generate new knowledge. Similarly, the purpose and objectives of the research serve to explain why the research is being conducted, and the value hoped to be gained by it. Including a narrative on the applicability of the research not only serves to finely tune the scope and limitations of the research but also serves to answer the question: What good can this research really accomplish? This, taken with an implied connotation toward real-life situations.

1.3. Gap Analysis and Derivation of Problem Statement

1.3.1. MAUT, AHP, ANP, and New Combinational MCDM Hybrid Approaches

Academic advances in the area of MCDM have certainly opened the door for discovering new practical applications, but the existing MCDM models have yet to yield an adaptable framework for environmental projects that engenders confidence, especially those that involve contamination (Linkov, Varghese, Jamil, Seager, Kiker, & Bridges, 2004). Melding two or more MCDM models together is nothing new; for instance, MAUT and AHP have often been compared, and in at least a few instances, have been used jointly to bolster practical decisions in the field. To the extent that the literature review has yielded, no existing research has been discovered that:

- Compares and contrasts MAUT and ANP in terms of case study involving radon; or
- Attempts to hybridize and integrate MAUT, AHP, and ANP in the way that has been done in this research; or
- Attempts to evaluate the efficacy of a combinational MAUT-ANP hybrid model via application on a case study involving radon.

One of the objectives of this dissertation is to compare and contrast MAUT and ANP, especially in terms of the particular case study involving radon. As evident from the literature review, and in very plain and general terms, MAUT, AHP, and ANP have all been debated for decades, and there are well documented advantages and disadvantages to every MCDM. It would seem to be of little academic importance to merely review these MCDM theories on their respective merits alone because to do so would conceivably do nothing more than add yet another opinion to the already abundant stack of such opinions on the matter. The future of MCDM lies in combinational hybrid approaches. Comparing these MCDM theories through the lenses of practical applications gives them substance, and provides a way to identify and define their respective limitations and potentials. In doing so, a path is paved toward modification and adaptation, which in turn, paves the way toward the creation of new knowledge where none existed before.

Figure 3 illustrates where MAUT and ANP exist in the universe of MCDM techniques, as well as the attributes that are hybridized in this research.

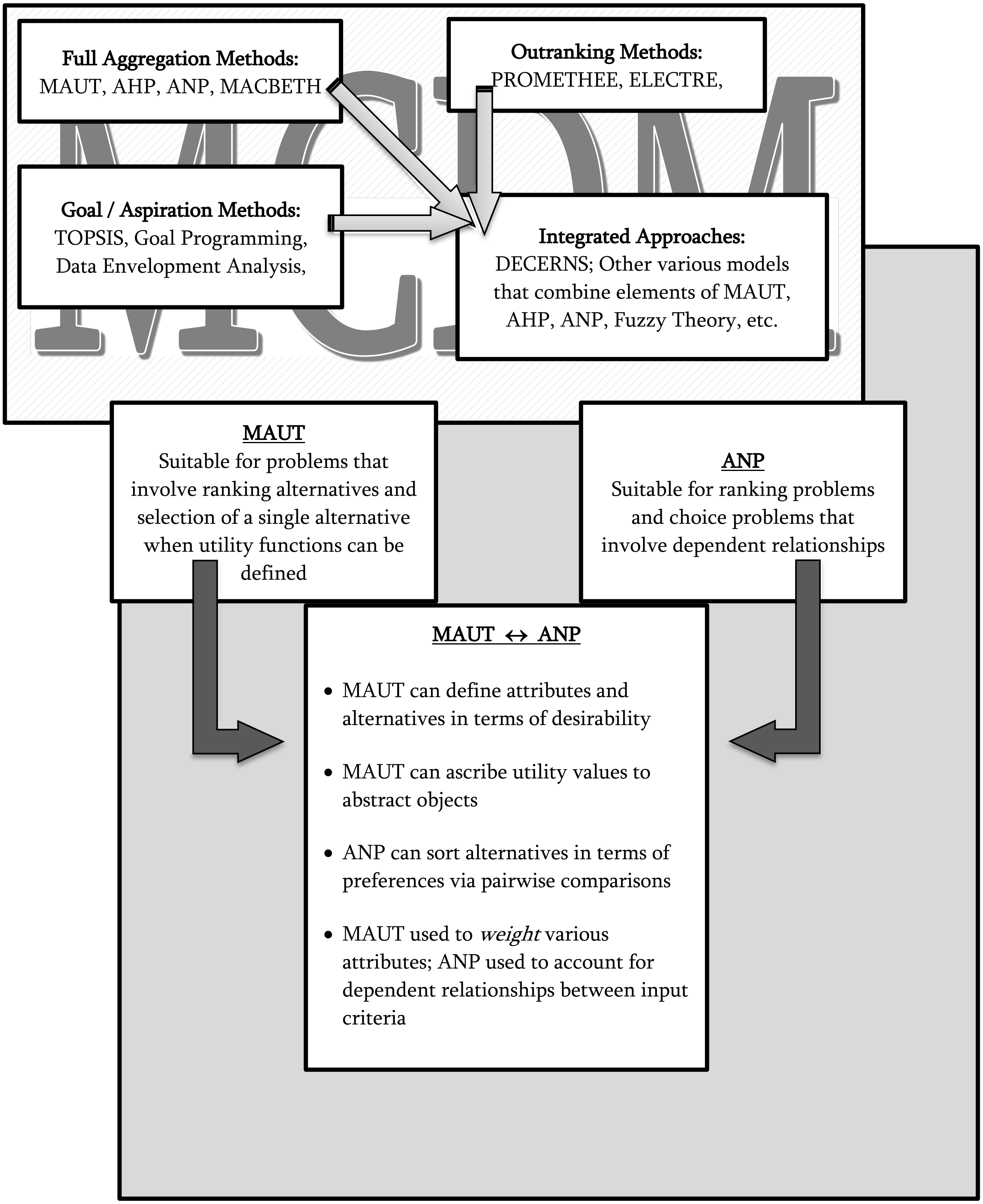

Figure 3. MAUT and ANP in the MCDM Universe.

The general premises of these three prescriptive theories are simple: MAUT provides rankings based on utility scoring techniques; AHP provides priority scores based on pairwise comparisons; and ANP enables decision-makers the ability to understand and evaluate the interconnectedness of AHP priorities. What, however, might a hybrid approach be? How might these theories be combined to effectively answer decision-making problems? How so configured? How so arranged? Figure 4 illustrates a few examples for hybridizing these MCDM theories while Table 1 presents their respective advantages and disadvantages in very general terms.

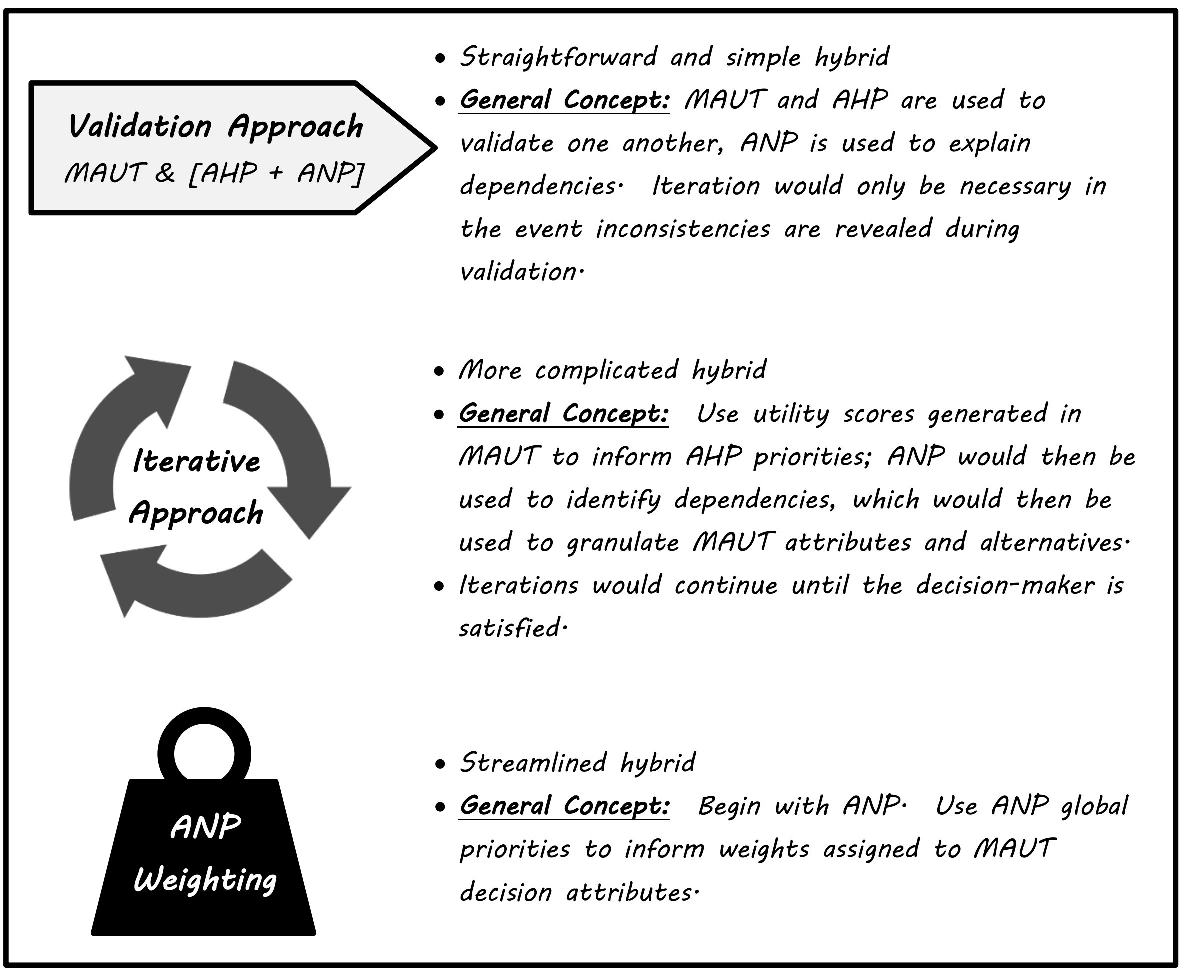

Figure 4. MAUT-ANP Hybridization Concepts.

Table 1. General Advantages and Disadvantages of MAUT, AHP, ANP, and MAUT-ANP Hybrid Approaches.

	Advantage	**Disadvantage**
MAUT	• MAUT's chief advantage is that it reduces everything to equal units of utility (which is just a number, and has no actual units)—this allows for apples-to-oranges comparisons (Ishizaka & Nemery, 2013; Linkov & Steevens, 2008). • Can account for uncertainty, and incorporate preferences (Velasquez & Hester, 2013). • A properly conducted MAUT can be a very thorough and comprehensive MCDM technique.	• Preferences must be precise. • Takes a considerable amount of time to program inputs properly (Velasquez & Hester, 2013). • Weighting factors obtained through less rigorous surveys (or no surveys at all) may not accurately reflect stakeholders' true feelings (Linkov & Steevens, 2008). • In general, MAUT analyses also assume the input criteria are independent.
AHP	• AHP's chief advantage is that it relates things in a way generally akin to the way humans think: in terms of comparisons and superlatives (Velasquez & Hester, 2013). In other words, AHP are plausible and people usually agree with the model-determined outputs (*i.e.,* priorities). • AHP is an intuitive and very easy-to-use decision-making approach, and can be modeled using little more than a spreadsheet and simple calculations (Ishizaka & Nemery, 2013). • Combining multiple inputs from several persons can be done relatively easily. • AHP models can be easily explained to people who do not have a background in MCDM, which can come in handy when trying to convince executives, research grant underwriters, lay members of the public, and the like of its merits.	• AHP has received criticism for some rank reversal issues relating to the way pairwise comparisons are structured, which has led to inconsistency issues (Velasquez & Hester, 2013). • Inconsistency can force decision-makers to change the inputs; such manipulation can be viewed as gaming the decision model to produce a desired output, which is counterintuitive and counterproductive to the prescriptive decision-making process. • AHP is not as thorough as MAUT. • Like MAUT, AHP cannot readily account for dependencies and the interconnectedness of decision attributes and alternatives (Ishizaka & Nemery, 2013).

Table 1 (Cont'd). General Advantages and Disadvantages of MAUT, AHP, ANP, and MAUT-ANP Hybrid Approaches.

	Advantage	**Disadvantage**
ANP	• The chief advantage of ANP is that it can model dependent relationships between input criteria (Ishizaka & Nemery, 2013). • ANP is more sophisticated than AHP, and can provide decision-makers with a better understanding and awareness of the dependencies and interconnectedness of decision attributes and alternatives. • Due to the fact that ANP forces precise definitions of nodes and other interconnections, some problems can only be solved using ANP. • Ideal method to gain a deep understanding of a specific decision problem.	• The chief disadvantage of ANP is that it is too complex to be used as a standard tool for practical decision making in organizations; accordingly, it is often used primarily in academic settings and in special situations. • Modeling ANP decision problems requires sophisticated software (Ishizaka & Nemery, 2013). • ANP is difficult to explain to people who do not have a background in MCDM, which can be burdensome when trying to explain its merits to executives, research grant underwriters, and lay members of the public. • Like AHP, ANP is often criticized for its use of pairwise comparisons not being able to accurately reflect stakeholders' true preferences. ANP also requires time-consuming calculations (Ishizaka & Nemery, 2013). • Very difficult, if not impossible, to verify results due to feedback loops and interrelation of nodes.
Validation Approach Hybrid	• Independent validation provides a superior degree of comfort when a decision alternative is ultimately selected. • This approach would conceivably have greater initial academic acceptance because little is done to parse or otherwise modify the respective theories, and all three theories are already well-established and accepted by the academic community.	• Performing a proper MAUT analysis can be very time consuming on its own; factoring in two additional—and independent—MCDM modeling efforts would only prolong an already lengthy decision-making process. • Aside from instances where the validation might reveal some major discrepancies, this is a take-it-at-face-value approach, with the MAUT and AHP-ANP aspects essentially serving as sanity checks on each other.

Table 1 (Cont'd). General Advantages and Disadvantages of MAUT, AHP, ANP, and MAUT-ANP Hybrid Approaches.

	Advantage	Disadvantage
Iterative Approach Hybrid	• A truer hybrid approach that links the three theories together in which emphasis is placed on the thoroughness and comprehensiveness of MAUT and the ability of ANP to reveal dependent relationships. • The presence of ANP in the iteration loop can be of great use because it will inform the MAUT of the perceived dependencies between alternatives and attributes, which could then be addressed on successive iterations.	• Lacks the element of independence between the theories, which makes validation more difficult. • The intent of performing pairwise comparisons in AHP is to elicit value judgments from decision-makers; it is conceivable that something may become "lost in translation" by using MAUT utility scores to inform AHP pairwise comparisons. • Iterations could be time consuming. • May take a while to become accepted as a useful MCDM technique.
ANP-Weighting Hybrid	• There is precedent in the literature for using AHP in a manner similar to what this hybrid approach advocates, which may help with acceptance in various communities of practice. • Beginning with ANP, and then using those relationships to inform weighting factors for a MAUT would be the most time efficient hybrid approach of the three discussed in this dissertation. • Using ANP to inform the weighting factors for a MAUT analysis provides a considerable degree of robustness to the MAUT. • This hybrid approach is a streamlined approach, and one that draws out the strengths of each theory.	• Lacks the element of independence between the theories, which makes validation more difficult. • The only mechanism to deal with disagreements between the outcomes of the MAUT and ANP models is policy-based (the results of the MAUT analysis are, by policy, accepted as the outcome of the combinational hybrid approach). • Even with some precedent established via similar combinational hybrid approaches, it may still take a while to become accepted as a useful MCDM technique.

1.3.2. Gap Analysis: A Clear Need for MCDM in Environmental Management Applications

There are more than a *thousand* environmentally contaminated sites listed on the Environmental Protection Agency's (EPA) National Priorities List (NPL) (EPA, 2017). Management of these sites requires difficult decisions to be made, which nearly always includes attributes like: ecological and environmental benefits and sustainability, economic impacts, socio-political factors, and technological feasibility considerations, *etc.* In addition, Singer-Vine, Emshwiller, Parmar, and Scott (2014) reported that there are 201 radioactively contaminated sites across the United States, 43 of which have been noted to be of significant concern.

In the United States, there are certainly a few dozen case study examples that prove formal MCDM processes have in fact been implemented in real-life environmental management situations (and albeit, a few hundred or so more examples of the same worldwide), but this number pales in comparison to the thousands of major environmental projects taken on every year for which complicated decisions are made with little to no application of a formal MCDM process.

To an even lesser extent is there any comprehensive and noteworthy mention of a formal MCDM process applied to decisions that involve radioactive materials, especially radon. Furthermore, and as a matter of an extensive literary search, the use of MAUT and ANP is not believed to have *ever* been formally used to analyze the selection of a geographic location to represent natural radon background, in air, or otherwise.

Accordingly, a knowledge gap is believed to exist concerning the use of MAUT and ANP in the field of engineering management, and more especially, in situations that involve environmental remediation and/or radioactive materials. The *problem statement* of this dissertation can thus be defined: this dissertation analyzes how MAUT and ANP can be used, both individually and combined as integrated approaches, in terms of a case study involving the selection of a geographically appropriate location indicative of the relative natural background value for radon [in air]. Additionally, and stated a bit more broadly, this dissertation seeks to interpret how the practical application of MAUT and ANP, both individually and combined as integrated approaches, can assist in making related decisions at environmental sites, especially those that involve radioactive materials.

1.4. Purpose of the Research

Ananda and Herath (2009), Linkov *et al.* (2004), and Kim, Park, Lee, and Jung (2007) pointed to the use of MCDM methods in the area of environmental remediation, but upon closer inspection, the gap analysis presented above is re-affirmed.

Ananda and Herath (2009) attested to the benefits of various MCDM methods with special reference to forest management and planning; the majority of their paper focuses on MAUT, Multi-Attribute Value Analysis (MAVT), the Analytical Hierarchy Process (AHP), and ANP. They also provide a summary review of a few other MCDMs, including: so-called *fuzzy* methods,[1] outranking methods[2] (*e.g.,* Compromise Programming (CP), the Preference Ranking Organization Method (PROMETHEE), the *ELminiation Et Choix Traduisant la REalité* (ELECTRE) method, *etc.*), and conjoint analyses.[3] Ananda and Herath (2009) summarized the findings of 27

[1] Fuzzy Theory was first posited by Lotfi Zadeh in the 1960s, but the theory of fuzzy logic was studied as early as the 1920s (Hájek, 2000). Fuzzy logic and fuzzy theory is an alternative approach to MCDM that is able to account for uncertainty and imprecision by virtue of assigning gradations of membership functions (Fuzzy, 2014; Zadeh, 1965). Fuzzy theory can sometimes express decision goals more akin to the way humans think, rather than by ascribing prescriptive axiomatic values of utility (Shi, Wang, Kou, & Wallenius, 2011; Zadeh, 1965).

[2] Outranking methods are focused on the preference of each alternative relative to one another, rather than couching the preferences in terms of an absolute scale.

[3] Conjoint analysis is a *choice modeling* approach to MCDM that involves the use of individual responses to hypothetical situations and is common in marketing surveys (Ananda & Herath, 2009). Conjoint analysis decomposes "a set of factorially [*sic*] designed attributes (or stimuli) so that the utility of each attribute can be inferred from the respondent's overall evaluations" (Ananda & Herath, 2009, p. 2543).

environmental studies that used AHP, 17 that used MAUT or MAVT, and 19 that used other methods.

Linkov *et al.* (2004) added to the foundation of MCDM models for solving problems at contaminated sites and provided a summary review of 17 studies that involved the use of MAUT, five studies that involved the use of AHP, and ten studies that involved the use of some combination of two or more MCDM models. Furthermore, Kim *et al.* (2007) provided a discussion for the use of MCDM at decommissioning sites using MAUT but with a twist: MAUT was the MCDM model used, but AHP was used to determine the weighting attributes.

While MCDM covers more than a dozen formal techniques (also referred to as *models*), each with its own dogma, technique, and school of thought, this dissertation will focus on only two such techniques, namely: MAUT and ANP. According to Ishizaka and Nemery (2013), both are categorized as *full aggregation* methods.[4, 5] Noting the gap assessment, and considering the literature review, the scope of this dissertation becomes more clearly defined; the *purpose* and *specific objectives*[6] of this dissertation are to:

1. Contribute to the field of engineering management by providing a meaningful and detailed discussion of how the practical application of MAUT and ANP, both individually and combined as an integrated approach, can be used to help decision-makers, especially in terms of the case study.

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[4] Full aggregation refers to an approach for the type of decision problems that generate individual utility functions that then combine later in the decision-making process to determine a global, or *aggregate*, score. In this way, a poor score on one criterion can be compensated by a good score on a different criterion (Ishizaka & Nemery, 2013).

[5] MAUT, AHP, and ANP are all considered full aggregation approaches to MCDA. MAUT uses utility functions as inputs, whereas AHP and ANP both use pairwise comparisons as their inputs. All three methods can produce outputs with complete ranking scores (Ishizaka & Nemery, 2013).

[6] An extensive literature review suggests these objectives will generate new academic knowledge and will therefore, as set forth in the requirements of Old Dominion University's (ODU) Graduate Catalog, embody "independent and original research" (ODU, 2015, p. 184).

2. Further contribute to the field of engineering management by examining the benefits and shortcomings of MAUT and ANP, both individually and combined as an integrated approach, especially in terms of the case study.
3. Better inform and educate engineering management practitioners and professionals, especially those who specialize in the areas of environmental remediation and radioactive materials.
4. Discuss the potential for MAUT and ANP in wider applications of environmental sites associated with radioactive materials, especially those that involve radon.
5. Analyze the results of the case study problem using the selected MCDM software programs.
6. Interpret and synthesize the results of the MCDM models.

In addressing the problem statement, a specimen decision problem will be programmed into two Decision Support Software (DSS) programs, namely: Microsoft Excel (for MAUT and AHP) and Super Decisions (version 2.8) (for ANP).

1.5. Framing the Problem Statement in Terms of Case Study Applicability

1.5.1. An Underlying Cause: The Desire to Find a Better Way to Make Decisions

The driving force predicating this research is the desire to determine if MAUT and ANP can be amalgamated in a way that exploits their strengths but minimizes their weaknesses. While any number of the various MCDM methods available could likely be of significant value to organizations involved in the management of technical, scientific, and environmentally sensitive endeavors, in practice, formal MCDM methods unfortunately do not often get discussed, let alone implemented outside of academia. Of particular concern is, as Linkov, Varghese, Jamil, Seager, Kiker, and Bridges (2004) pointed out, "Formal applications of MCDA in management of contaminated sites are still rare" (p. 46).

Understanding the intricacies of MAUT, AHP, and ANP, and then using that knowledge to develop a new decision-making approach could conceivably have many different applications in the field of engineering management. By virtue of a specimen site used as a proxy for the generalizability of the entire theory, the intent of this dissertation is to examine each of these MCDM methods, and then show the real-world practicability of the three combinational MCDM hybrid approaches presented in Figure 4 and Table 1.

1.5.2. Explained: What "A Geographically Appropriate Location Indicative of the Relative Natural Background Value for Radon" Really Means

At this juncture, the concept of radon background should be fully explained. Accounting for anthropogenic contributions of radon[7, 8] is important for certain regulatory agencies, companies, and organizations in the nuclear and environmental industries. In order to differentiate between naturally occurring and anthropogenic levels of radon, it is necessary to establish what the natural levels are or ought to be (EPA 1989, 2002; Nuclear Regulatory Commission [NRC], 2011). The value attributable to the natural level of radon is called *background*, and this would, for all intents and purposes, be considered a *baseline* condition. Human activities can also introduce radon into the natural environment, so it becomes helpful—and is usually required for

[7] While several isotopes of radon exist, Radon-222 (^{222}Rn) is the isotope of greatest concern. ^{222}Rn has a half-life of 3.82 days and is a constituent in the Uranium-238 (^{238}U) decay series. The RDPs discussed in this research are all members of the ^{238}U decay series; other isotopes of radon have much shorter half-lives, as well as different decay products. Differentiation of the radon isotopes is not necessary for the MCDA purposes of this dissertation.

[8] Radon is a naturally occurring radioactive element found ubiquitously on earth. Radon has several isotopes, each with different half-lives. Due to the nuclear transformations that take place when radon decays, and because radon exists as a gas at Standard Atmospheric Temperature and Pressure (STP), exposure to radon can increase the likelihood of deleterious biological effects (*e.g.,* cancer) (Radon, 2009, 2014).

purposes of regulatory compliance—to account for the incremental amount of radon contributions due human activities.

It should be noted, however, that radon is not an artificial element; it occurs naturally. When the phrase *anthropogenic* is used to describe the presence of radon or radon contributions to the environment, it is not intended to mean human activities *created* radon; rather, it means that human activities caused radon to be released into the environment, which would otherwise only have been released by natural phenomena.

The answer to the problem statement would be very easy in an ideal, perfect, and totally hypothetical scenario, in which a raw and undeveloped swath of land is identified as the future home for a facility that will introduce anthropogenic radon into the environment. In such a hypothetical scenario, in order to determine a geographic location that would represent the relative natural background value for radon in air, the following information would need to be considered at a minimum:

- The underlying geology would have to be consistent,[9] in general for the whole area, and especially with respect to the geology underlying the hypothetically proposed facility with respect to the location chosen to represent background.
- To validate the hydrogeology, a significant number of radon samples would need to be collected.[10]

[9] It would not be reasonable to assume all geologic and lithologic samples would be identical, rather consistency should infer that the same geologic formation underlies the areas of interest, at least with respect to the uppermost strata.

[10] Noting of course that the objective is to find a *location* and not to determine a *value*, the only reason why radon measurements would need to be collected, would be to help identify localized anomalies that may bias the decision (*e.g.,* localized "hotspots" caused by hydrogeological conditions not consistent with the general area of study). Radon measurements would have to be taken multiple times per season, multiple times per year and in a manner consistent with prescribed regulatory guidance.

- Relative elevation. In viewing this hypothetical, raw and undeveloped swath of land, the ideal location to represent the relative natural background value for radon in air would have to exist at the median elevation.
- Some sort of deed restriction or restrictive covenant would have to be proclaimed that would prohibit siting the future facility within some pre-determined distance of the location chosen to represent background.

Of particular note, in this hypothetical situation whereby there are no other existing anthropogenic activities releasing radon into the environment, windward exposure would really have little if anything to do with finding an appropriate geographic location to represent the relative natural background value for radon; in this hypothetical situation prior to operating this facility, any and all radon present would be considered naturally occurring, and therefore wind rose parameters would be largely irrelevant. For this hypothetical situation, the only foreseeable need to collect and include wind rose parameters into the decision problem would be to determine the minimum proximity at which the future facility could be located to the point chosen to represent background.

Of course, the specimen discussed in this dissertation, and many sites like it, do not fit the description of a site whereby a background location was identified prior to the commencement of activities that introduced anthropogenic radon. This complicates the decision problem.

Guidance for selecting a background value for radon in air is usually determined by finding a geographic location indicative of an area where the human activity of concern has not or could not have *reasonably* influenced the naturally occurring levels of radon (EPA 1989, 2002; NRC, 2011). However, finding a geographic location that can represent the true, natural value for radon background is not as easy it is seems because radon levels are affected by just about everything (*e.g.,* geology, topography, temperature, pressure, seasonal variations, diurnal variations, humidity, submarine groundwater discharge (SGD), soil moisture content, *etc.*).

Uranium in rocks and soil is the underlying source of radon, and varying quantities of uranium are found in nearly every geological formation around the planet (Radon, 2014). Once a radon atom is created (via the radioactive decay of radium) in the solid grains of the host material, it can emanate to pore spaces within the local hydrogeology. These pore spaces, being filled with other gases and/or solutions, provide migration pathways for the newly formed radon atoms to traverse sometimes significant distances from their respective generation sites. Once radon makes its way to the surface, it is *exhaled* into the atmosphere; diffusion[11] of radon into the surrounding air then occurs (Hassan, Hosoda, Ishikawa, Sorimachi, Sahoo, Tokonami, & Fukushi, 2009).

Radon is a heavy gas, so once it escapes its geological origins and becomes airborne, it tends to move (or sink) to low lying areas. Radon Decay Products (RDPs)[12, 13] are also a factor to be considered. For these reasons, throughout this dissertation, the phrase *relative natural background value for radon* is used, with emphasis on the word *relative*, as there really is no true natural background value that can ever be ascribed for radon.

To offer a convenient reference, and since it is at the heart of the case study and the circumstances surrounding the specimen site discussed in Chapters CHAPTER 3 through CHAPTER 5 of this dissertation, the factors that can affect measured radon values are summarized

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[11] Diffusion is the natural movement of molecules or atoms from an area of high concentration to an area of low concentration.

[12] Since all isotopes of radon quickly decay, the real health risks associated with radon actually come from RDPs (a.k.a., radon daughters or radon progeny). RDPs present health hazards because they are radioactive, solid substances that tend to attach to molecules suspended in the air (*e.g.,* water vapor, dust, etc.). RDPs include the short-lived isotopes: polonium-218, lead-214, bismuth-214, and polonium-214, and the long-lived isotopes: lead-210, bismuth-210, and polonium-210 (Radon, 2009, 2014; Connell, 2010).

[13] Current regulatory guidance in the United States compels licensees to include RDPs when calculating radon background (NRC, 2011, 2014).

in Table 2 below. In summary, however, the naturally occurring amount of radon in any given geographic location will always be a function of these phenomena.

Table 2. The Effect of Natural Phenomena on Radon.

Phenomenon	**Effect**
Barometric Pressure	Falling or lowering barometric pressure naturally tends to draw gases out of the ground, which would therefore increase the radon concentrations near the surface of the ground. Increasing barometric pressure has the opposite effect; that is to say, rising pressure would naturally tend to force [heavy] gases like radon back into the ground (Lindmark and Rosen, 1985). This concept is consistent with fluid flow mechanics (*i.e.,* the effect of pressure on radon gas can be accurately approximated in accordance with Bernoulli's Theorem, Darcy's Law, and Fick's Law to account for the effect of dynamic pressure, fluid flow through porous media, and gaseous diffusion, respectively).
Diurnal Changes (*i.e.,* differences between day and night)	Chambers (2008), Lindmark and Rosen (1985), and Hoffman (1995), among others, all discuss the variations observed in radon concentrations between daytime and nighttime. Radon concentrations tend to be greatest at night and smallest during the peak of the day.
Elevation and Topography	Radon is the heaviest gas on the periodic table of the elements (Radon, 2014). It is eight times heavier than air, and as such, follows the same path that natural waterways do. As air is a fluid, radon naturally sinks to the bottom and flows to the lowest lying point in a geographic formation (*e.g.,* a valley floor, dry creek or lake bed, *etc.*); this is also the reason radon is found in basements. In the absence of fluid movement (*e.g,* wind, ventilation, natural convection, *etc.*), radon will accumulate in low-lying areas. Thus, radon would tend to be found in lower concentrations at higher elevations, provided there is a topographic path for flow (to allow radon to escape); conversely, it would be found in higher concentrations at lower elevations.
Geology	Geology is the **underlying cause for the presence of radon,** as radon comes from the decay of radium, and ultimately, from uranium (Radon, 2014). Concentrations of radon are greatest in geographic areas where the underlying geologic formations contain uranium mineral deposits (Radon, 2014). Thus, geology greatly influences the amount of radon in any particular area.
Humidity and Precipitation	As with soil moisture, higher humidity tends to suppress radon. In general, radon tends to have low solubility; however, radon tends to be more soluble in water as temperature decreases. After precipitation events, radon levels tend to decrease. This is due to water saturating the soil, which dissolves radon, and simultaneously removes it from the interstitial spaces of the soil. That is to say, radon that was trapped between grains of soil gets displaced and entrained in the water (Hoffman, 1995). As this serves to mobilize radon, it is obviously undesirable. However, regardless of whether the radon is trapped in soil or trapped in water, the immediate effect suppresses gaseous diffusion, and therefore, keeps it out of the air.

Table 2 (Cont'd). The Effect of Natural Phenomena on Radon.

Phenomenon	**Effect**
Nuclear Transformations	The half-life[14] and mode of nuclear decay play roles, albeit small ones, on radon measurements. Half-lives of any radionuclides are probabilistic, not certain; in addition, the actual risk to human and environmental receptors from radon can only occur if a radon nucleus undergoes a nuclear transformation while in contact with living tissue (for all modes of decay but especially for α-decay), and realistically only when in close proximity to living tissue for β and γ emission. Sophisticated measurement techniques and instruments aside, the ability to measure radon in the field generally relies on radon actually undergoing a nuclear transformation during measurement to detect its presence.
Seasonal Variations	As noted by several research papers, Chambers (2008), Schumann, Owen, and Asher-Bolinder (1988), RTI and Arcadis (2012), and Hoffman (1995), just to name a few, radon concentrations tend to increase during the winter months and decrease during the summer months. These trends have been observed year in and year out during various multi-year studies.
Soil Type	In general, larger-grained soil allows radon to escape to the surface of the ground more easily than finer soils. Radon moves through soil via convection and diffusion (Schumann, Owen, and Asher-Bolinder, 1988).
Soil Moisture	In general, lower moisture content will allow more radon to escape. According to Schumann, Owen, and Asher-Bolinder (1988), radon emanation from soil is greatest between 15 and 20 percent moisture content by weight. Higher moisture content in the soil tends to trap radon atoms in the pore space between soil grains.
Temperature	Higher temperatures cause gases to rise and expand within a system, whereas lower temperatures cause gases to sink and contract.
Wind Rose Parameters and Ventilation (*i.e.,* fluid movement)	Movement of air is arguably the biggest factor that affects radon levels in any given area (noting that if it were not for the presence of uranium minerals in the rocks and soil then radon would not be present in the first place). Wind causes radon to disperse. When radon is detected in homes, the usual remedy is to install a ventilation system to circulate fresh, clean air into the impacted spaces thereby evacuating the radon. The concept is no different in the natural environment: periods of calm allow radon to accumulate, whereas windy conditions displace radon thereby lowering the concentration.
Diurnal Changes (*i.e.,* differences between day and night)	Chambers (2008), Lindmark and Rosen (1985), and Hoffman (1995), among others, all discuss the variations observed in radon concentrations between daytime and nighttime. Radon concentrations tend to be greatest at night and smallest during the peak of the day.

[14] For reference, the term *half-life* ($t_{½}$ or sometimes, λ) refers to the amount of time it takes for half of any given quantity of a substance to radioactively decay into a different substance. For instance, in the case of ^{222}Rn, λ = 3.82 days, which means that in roughly 3.82 days, half the amount of any given quantity of radon will have radioactively decayed and will no longer be ^{222}Rn. (For the curious reader, it decays into polonium-218 (^{218}Po), which is also radioactive. The decay chain continues until, after having transformed into several isotopes along the way, polonium-210 (^{210}Po) α decays into lead-206 (^{206}Pb), which is stable and does not decay further.) (HPS, 2009).

In addition to the physical and nuclear phenomena that can affect radon in the natural environment, there are a myriad of other considerations, not the least of which involve conflicting political motivations, public concerns, economic factors, and technical practicability issues. Current regulatory guidance establishes a limit for exceedances from licensed facilities but only in terms of a set increment. The only two values that can be known with any degree of certainty are *zero* and the *measured amount* of radon itself. Thus, in order to determine the human-caused contributions to the environment, it becomes necessary to solve for the variable in the equation, which is background.

The applicable regulations[15] prescribe thresholds as an incremental value (*i.e.,* a defined, discrete interval greater than the established background, anything above which a Potentially Responsible Party (PRP) could be forced to take remedial and/or corrective actions).[16] As illustrated in Figure 5, the regulatory limit remains constant in all three scenarios. Nothing can be done to change the zero threshold, and aside from instrumentation issues, the actual amount of radon measured is generally honored at face value. (The increment defined as the regulatory limit is fairly rigid too, though arguably could be changed via legislative action.) What changes in each situation is the value ascribed to natural background. For most situations, the PRP in question will bear the responsibility for the difference between the measured amount of radon and background. In practice, due to the factors and considerations discussed earlier, establishing a radon background value is not as easy as it may seem, and can sometimes be a controversial process.[17]

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[15] As of the date of this dissertation, only interim guidance is available.

[16] Current regulations dictate that members of the public cannot be exposed to more than 100 millirem (mrem) per year from licensed facilities; it is noted that the limit is 100 mrem *above* background.

[17] The process can be controversial due to the conflicting, and often politicized, interests between: (1) licensees, who bear the financial burden for abatement and/or remedial systems if the measured levels of radon exceed the allowable limit, (2) non-government organizations and environmental activist groups, and (3), regulatory agencies who are held accountable for establishing and enforcing the limits.

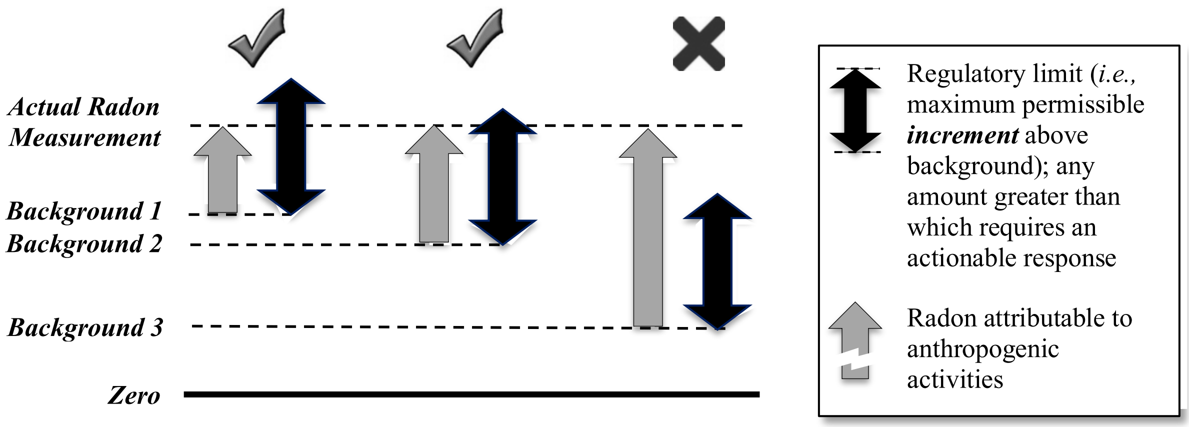

Figure 5. How Radon Background Is Affected by Incremental Regulatory Limits.

1.5.3. Applicability of the Problem Statement to Case Studies Involving Radon

Noting the factors that affect radon measurements, and the often controversial nature of selecting a geographically appropriate location to represent the relative natural background value for radon, additional clarification is warranted to describe the situations in which an MCDM process can be used. There are three basic categories that can describe these situations:

1. Greenfield sites;
2. Disturbed sites with no history of licensed activity[18] in the vicinity; and
3. Disturbed sites that do have a history of licensed activity in the vicinity.

A greenfield site is a location that has never been disturbed in modern history by human activity. Greenfield sites are the least controversial category to deal with due to the lack of PRPs. The only challenge in finding a location to use as a background monitoring station for radon is ensuring that *that* location is truly representative of the area, and not being unduly influenced by nearby sources. (It should be noted also, that the EPA-recommended limit for indoor radon is 4.0

[18] Licensed activity refers to any site, operation, or facility whose activities were licensed by a government regulatory body to possess, process, produce, handle, generate, transfer, and/or dispose of radioactive materials.

pCi/L (EPA, 2013),[19] and it is not uncommon for radon levels in the natural environment to exceed this amount, especially in mineralized areas.[20])

The second category involves establishing a geographically appropriate location indicative of the relative natural background value for radon at a *disturbed* site. This category tends to be more controversial than the first because there are more unknown factors to address, many of which will never be solved. For a disturbed site, the area in question would have known improvements and changes to the real property (*e.g.,* an old factory that was torn down, a new university research wing built where an old one once stood but has since been demolished, a repurposed warehouse that has been turned into a gym, *etc.*), but this category specifically excludes any disturbances from sites where a licensed facility would have caused radon or RDPs to be introduced into the environment.

Even though this category refers to sites where previous disturbances did not involve licensed activities, there is more concern about anthropogenic contributions of radon and RDPs to the environment because whenever earthen material is excavated, tilled, or even moved to build houses and buildings, or to trench in utility lines, or any other similar such activity, it is possible that radon radium, thorium, and/or uranium will be exposed and brought to the surface. In fact, even small amounts of radium can cause dramatic increases in radon concentrations (Connell, 2010). Additionally, if any nearby homes or buildings have radon abatement systems already installed, the exhausts from those systems could also bias efforts to determine what the *natural*

[19] It is estimated that more than 70,000 schools, homes, and places of work across the United States exceed EPA's recommended safe limit for indoor radon (EPA, 2013). Research has shown that there may be a direct relationship between indoor levels of radon and the concentration of radon in soil (Shirav and Vulkan, 1997), as well as in groundwater (Radon, 2009).

[20] A *mineralized area* is an area where natural resources are concentrated in the underlying geologic and hydrogeologic formations; for the purpose of this research, minerals containing radioactive sources, like: uranium, thorium, protactinium, and radium are of significant concern.

relative radon background value should be (Connell, 2010). In order to better illustrate this last point, Figure 6 below pictorially explains how radon can get into dwellings and other structures. Disturbing the ground and/or the abating radon from other structures essentially moves radon from its natural place to a new place.

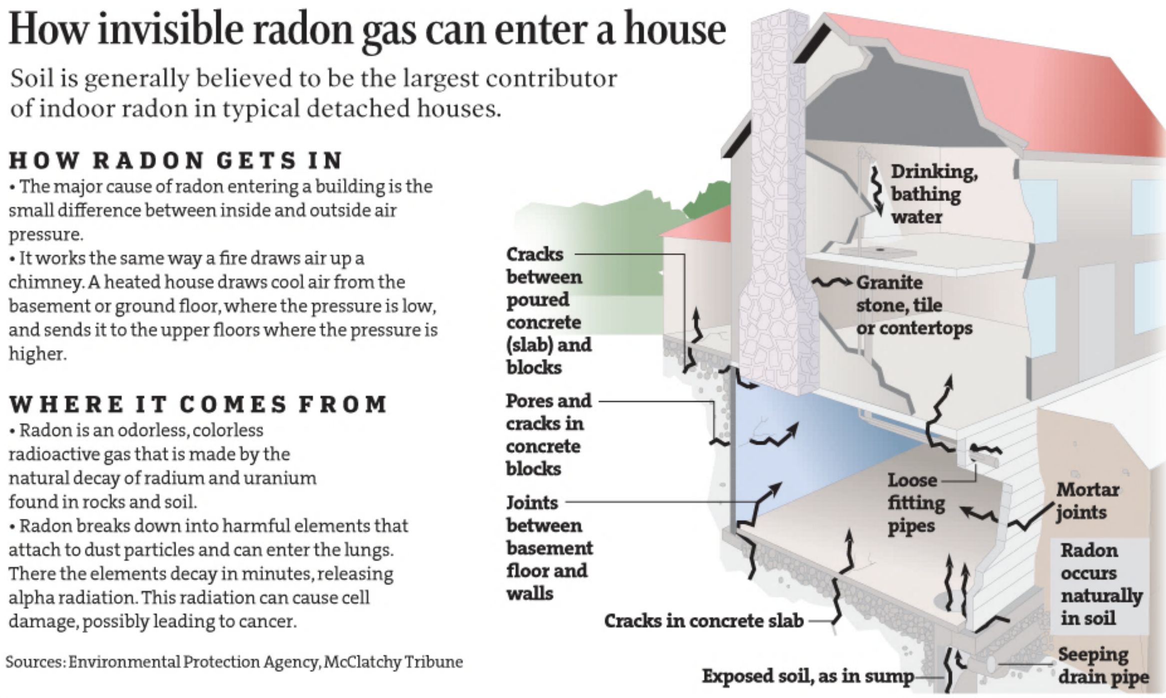

Figure 6. Exposure Pathways for Radon and RDPs.[21]

As with essentially every construction project, it would be highly unusual if pre-construction soil samples actually were collected and analyzed for radon, RDPs, or even radon parent isotopes before construction activities commenced. Post-disturbance, and for want of a pre-

[21] Illustration by Mr. Raymond Grumney at the Minneapolis Star Tribune, © 2010. Graphic used with permission.

anthropogenic baseline, it is causally impossible to determine how much influence such disturbances would have on subsequent radon measurements.[22]

The last scenario involves another type of disturbed site: a site at which a nuclear facility exists for which a pre-anthropogenic value for radon was not established. Any one of a number of old uranium milling or processing facilities, primarily in the western United States would fall into this category. If not properly capped, tailings[23] impoundments (a.k.a., tailings *piles*) containing radium, thorium, and uranium byproduct material[24] can emit significant amounts of radon. Nearly all the legacy mill sites, processing facilities, and other sites that handled or milled uranium before 1978[25] did so without any context of a baseline value for radon. Sites that fall into this category represent the most challenging scenario. The difficulty is largely due to the following factors:

1. Since no baseline values exist at these sites, confounding variables preclude anyone from ever ascribing a value for radon background with certainty;
2. In nearly every case, communities have developed over the course of time, and/or other disturbances to the land have occurred in close proximity to these legacy sites, which inevitably adds a significant degree of socio-political involvement to the decision-making process; and
3. These sites are almost always located in mineralized areas.

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[22] The phrase *vapor intrusion* is now used to describe how harmful gases, including radon, find pathways into dwellings and other structures.

[23] In mining processes, *tailings* refers to the residual byproduct material that remains after the desired minerals or metals are extracted from their respective host ores.

[24] Uranium byproduct material is heavily regulated in the United States.

[25] The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 prescribed sweeping environmental standards for the uranium recovery industry.

In essence, this final scenario basically has all the complexities of the greenfield and disturbed site scenarios but is compounded by the fact that these sites represent the largest source of anthropogenic contributions of radon to the environment. There are several such sites strewn across the globe.

1.5.4. Location v. Static Value

In summary, whether it is a greenfield site or a disturbed site or an old uranium tailings impoundment, determining the relative natural background value for radon can be challenging. Framing the problem statement in terms of the applicability to the case study begs a question: Is the objective to pinpoint and flag a particular geographic location or a value? The answer: It depends on what question is being asked.

As mentioned above, many natural phenomena affect radon. For any given location, the measured value for radon will vary from one day to another, from one week to another, from winter to summer, from day to night, *etc.* For most situations, it would not be fair to licensees to establish a static background value to be used for all future comparisons [to measurements taken at the licensed facility]. Rather, due to the many things that affect radon, it is more appropriate to establish a location, such that whenever future measurements are taken at the licensed facility, so too are new measurements taken at the background location for comparison.

Arguably, solving for a background value instead of a background location would still rely on nearly all the same attributes, even if the nature of the alternatives is different. That said, framing the question in terms of finding a background value would seem to either be a one-time event, or an event that would need to be executed every time compliance measurements are collected; whereas framing the question in terms of finding a background location provides a baseline reference value, for a baseline that is understood to always be in flux. As evidenced in the three scenarios above, determining a location rather than a value, frames a problem statement with many common attributes. For this particular case study, these attributes will be discussed in more detail in Chapters CHAPTER 3 and CHAPTER 4 but generally include:

1. The aforementioned natural phenomena that affect radon (*see* Table 2);
2. Perceived social stewardship / political value; and
3. Cost.

1.5.5. Applicability of the Problem Statement to Case Studies Involving Other Decisions in Engineering Management

Objectification of the notion of "determining a geographically appropriate location indicative of the relative natural background value for radon" as a case study of a MCDM problem requires a predication of a more interesting and comprehensive look at MCDM techniques. Clearly, the objective of this dissertation is not to provide a be-all end-all MCDM/MCDA philosophy for all matters pertaining to engineering management decision problems; the deeper revelation of this dissertation is that classical academic theories for MCDM in real-life applications can be extraordinarily difficult, time consuming, and tedious, not to mention extremely subjective. Hence, the underlying impetus of trying to find a better way to make decisions.

In a broader and more generalized sense, the case study explored in this dissertation could just as well have been an in-depth look at any number of other real-life engineering management decisions. For instance, a decision must be made pertaining to the selection of the best strain of soybean and where to plant it. The assortment of possible locations would represent the decision alternatives, and the many attributes could be defined by any number of pertinent parameters, including: soil chemistry characteristics, average days of sunshine, UV intensity, wind rose parameters, cost of pesticides and fertilizers (or even whether or not to use them), temperature, precipitation, equipment required, land use optimization factors, employment factors, and the ever-important political factors, *etc.*

Or perhaps the MAUT-ANP approach discussed in this dissertation could have explored practical applicability in terms of a defense contractor's decision as to whether it would be worthwhile to compete for a new super-cooled rail gun contract with the military. As will be explained in

CHAPTER 2, several qualities of ANP would be well suited for this type of decision, because ANP is adept at explaining the relationships between decision attributes and alternatives. CHAPTER 3 of this dissertation explores the relevant details about the attributes of the specimen case study site that involves radon; for a true-to-form, real-life technical, scientific, and/or engineering-related decision problem, significantly more detail would be required to provide a comprehensive MCDA. For instance, in order for a defense contractor to decide whether or not to bid on a new weapons research and development project, several underlying attributes would need to be evaluated, such as: a comparison of the chemical and physical properties of various polymers, electricity consumption and coolant requirements of various cryogenic refrigeration systems, properties and expense of superconductor materials, reliability of various technologies, the mode and type of deployment platform (mobile, stationary, land-based, submarine, airborne, orbital-satellite based, *etc.*), the costs associated with building a new production facility, as well as the type, size, and cost of production equipment, estimated manufacturing costs, the costs and risks associated with maintaining secrecy and containing/controlling transfer of information, environmental concerns, and of course, political concerns, just to name a few.

Perhaps still, the specimen for the case study of this MAUT-ANP approach could have focused on exploring an engineering consulting company's decision to expand and grow its business practice into a new market sector. At a minimum, such a decision would need to account for: market competition (*e.g.,* how many other companies are providing the same services, an estimate of those companies' respective reputations, the quality of their respective relationships with their clients, and an estimate of the likelihood that those clients would stop doing business with competitors and start doing business with a new consulting company); availability, suitability, proximity, quality, and cost of office space; time and cost to acquire the proper business licenses and insurance; availability and proximity of suitable talent; an estimate of the amount of incentive pay it will take to acquire new talent; the availability and costs associated with training and indoctrinating new talent; an estimation of the desirability of the intended company's [new] service offerings in the locations being considered, and the perceived forward outlook for those service offerings within the specific locales being considered, regionally, and within the industry as a whole; how many existing relationships with clients exist in the market sector of interest and the quality of those relationships; the perceived affinity for the company to draw in new clientele once the new growth plans are implemented; and the estimated amount of time it would take to attract a sufficient number of clients to break even on the initial investment, just to name a few.

From defense contracts to develop new and futuristic weapons, to agricultural sciences, to business growth and development, and even beyond to things like: infrastructure development (*e.g.,* roads, rail, bridges, and tunnels, *etc.*), medical research, environmental engineering, genetic engineering, and robotics—especially *artificial consciousness*—the applicability of implementing the MAUT-ANP approach discussed in this dissertation has the potential to go far beyond a decades-old specimen case study involving radon background locations.

It is human nature to simplify problems, to boil them down into core elements and make decisions based on derivatives. As with just about everything in life, there is no easy answer. In some cases this approach might make perfect sense. In many cases, however, especially those that involve complicated engineering management decisions, a thorough and comprehensive approach might be the best way to proceed.

The criteria, alternatives, and attributes of any decision problem are dependent on the question asked (*i.e.,* the problem statement); decision problems involving the selection of a location for *something* are common in MCDM problems. While the point of this dissertation is focused on comparisons between MAUT and ANP in terms of the problem statement—the practical aspects are highly generalizable to other applications in the field of engineering management.

1.6. Null Hypotheses

There is a plethora of research available pertaining to RDM, MCDM, the various MCDM techniques, *etc.*, and there is equally an abundance of research on radon, radiation exposure, and nuclear physics—all are subjects that have been studied, arguably for more than a hundred years. Furthermore, there is no shortage of regulatory guidance governing nearly every aspect of the nuclear industry and various environmental parameters. However, there does not appear to be any comprehensive work that discusses the strengths *v.* weaknesses, advantages *v.* disadvantages, and similarities *v.* differences of MAUT and ANP in the context of a formal RDM or MCDM process for selecting a geographically appropriate location to represent the relative natural background value for radon (in air).

The value that MAUT and ANP can have in the selection of a geographically appropriate location to account for the relative natural background value for radon is used as a case study, and is one of the focal points for this dissertation. Noting the problem statement, gap analysis assessment, purpose, and specific objectives of this dissertation, the *null hypotheses* are thus given as follows:

1. Microsoft Excel, as a DSS model, cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.

2. SuperDecisions, as a DSS model, cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.
3. There will be no significant difference between the DSS-modeled results of a standalone MAUT analysis and a standalone AHP analysis when applied to the problem statement.
4. There will be no significant difference between the DSS-modeled results of a standalone MAUT analysis and the Iterative Hybrid analysis when applied to the problem statement.
5. There will be no significant difference between the DSS-modeled results of a standalone MAUT analysis and the ANP-Weighting Hybrid analysis when applied to the problem statement.
6. There will be no significant difference between the DSS-modeled results of a standalone AHP analysis and the Iterative Approach hybrid analysis when applied to the problem statement.
7. There will be no significant difference between the DSS-modeled results of a standalone AHP analysis and the ANP-Weighting Approach hybrid analysis when applied to the problem statement.
8. MAUT cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.
9. AHP cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.

10. ANP cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.
11. In terms of the problem statement, a comparison between the MAUT model's global utility scores and the global priority outcomes of the ANP model will be impossible.
12. The Validation Approach as presented in this dissertation cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.
13. The Iterative Approach as presented in this dissertation cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.
14. The ANP-Weighting Approach as presented in this dissertation cannot approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air.

1.7. Limitations and Key Assumptions of the Research

1.7.1. Limitations of the Research

The famous German-born rocket scientist Wernher von Braun once said, "Research is what I'm doing when I don't know what I'm doing" (World of Quotes, 2013, n.p.). Noting the problem statement, gap analysis, stated objectives, and null hypotheses, there are a number of items that require clarification so as to properly circumscribe the scope of this dissertation. These *limitations* are discussed next.

With respect to the null hypotheses: A simple model was created using Microsoft Excel to act as a DSS for addressing the problem statement. It is not the intent of this dissertation to evaluate the veracity of this dissertation's DSS model compared to others. While there are a number of software programs available, it is beyond the scope of this dissertation to offer any more justification for the selection of this platform other than Microsoft Excel is readily available and relatively straightforward to use from [this] researcher's perspective.

MCDM is a formal, quantitative process that embodies a combination of philosophy, theory, methods, and procedures to enable decision-makers to make better decisions. More specifically, MCDM models will not *force* decision-makers to make the *right* choice, nor will MCDM models even reveal what the *right* answer to a problem is. When it comes to RDM, there is no *right* or *wrong* answer. MAUT and ANP merely pick apart a problem, evaluate the various attributes of that problem, and then provide insight and guidance on the value that each of those attributes has for each of the alternatives.[26] From that, an overall understanding of the utility of each alternative can be achieved, which can then provide decision-makers with some quantifiable assessment of the choice to be made.

In noting the above, a further limitation to the research is that no surveys or other such information gathering techniques were used to generate the utility functions or the preference values used for the decision attributes in the decision models for this research.

In sum, with respect to the problem statement, the limitation is that the research will only show how the models were programmed, what the inputs were, what values were used for the preferences, an explanation for the rationale used to develop those preferences, and a discussion of the outcome. While everything else is essentially beyond the scope, there is still plenty of room

[26] When discussing MAUT, AHP, and/or ANP, an *attribute* is a feature or quality of an *alternative*. An *alternative* is one of the choices available to a decision-maker. For example, when trying to determine which car to buy, the *alternatives* could be: (1) a pick-up, (2) a min-van, or (3) a sport utility vehicle; the *attributes* of each alternative would be things like: occupancy capacity, fuel economy, price, color, engine size, transmission type, etc. Incidentally, while *criteria* and *attribute* can often be used interchangeably, there is a subtle difference: A *criterion* is used as a sorting schema. For instance, to say, "The car is red," is a way to describe an *attribute* of the car; to say, "The cars have been categorized by color," establishes a *criterion*. Thus, *criteria* are the means used to make a comparison between alternatives, whereas *attributes* are merely descriptive characteristics of alternatives. (*See* Table 3 for additional clarification.)

to generate new knowledge, with some further comfort being drawn from Goodwin and Wright (2014), who said:

> We should not expect decision analysis to produce an optimal solution to a problem, the results of an analysis can be regarded as being "conditionally prescriptive." By this we mean that the analysis will show the decision-maker what he or she should do, *given* the judgments which have been elicited from him or her during the course of the analysis. (p. 4)

With respect to the null hypotheses, and similarly, to the stated objective of discussing wider applications of MAUT and ANP at sites that deal with radon and other radioactive materials: It is not the intent of this dissertation to examine multiple sites, nor is such a discussion found herein; it is beyond the scope of this dissertation to provide a comparison of similar sites, or to even evaluate what criteria would constitute a *similar* site. The primary focus of this dissertation is on the comparison of MAUT, AHP, ANP, and the aforementioned combinational MCDM hybrid approaches.

The process of selecting a geographic appropriate location indicative of the relative natural background for radon is merely the case study to which the dissertation topic has been applied. MAUT, AHP, and ANP are the specific models that have been chosen to address the decision problem, and a brief discussion regarding the suitability of these models to address the problem statement is given in

CHAPTER 2 (*see* Table 4).

While references pertaining to the wider applications of MAUT and ANP are given throughout this work, the purpose of including such references in this dissertation is merely to offer a generalization of the results of *this* research. In this way, the results from *this* dissertation can be synthesized so as to speculate on the implications that a similar MCDM process might have at other sites with similar issues, and in the field of engineering management in general.

Even though a simple discussion is presented in

CHAPTER 2, it is not the intent of this dissertation to compare the various MCDM models to one another or to provide an in-depth rationale for suitability of these other MCDM models to address the problem statement. As with the selection of Microsoft Excel and Super Decisions to run the models, there could understandably be other MCDM models suitable for addressing the problem statement; this dissertation focuses only on MAUT, AHP, and ANP. As noted by Ishizaka and Nemery (2013), "None of the methods are perfect, nor can they be applied to all problems" (p. 6).

Furthermore, there are numerous studies that have already gone to great lengths to explore the complicated mathematical details of MAUT, AHP, and ANP, along with several other MCDM models. As such, it is not the intent of this dissertation to provide an in-depth analysis or discussion on the fundamental mathematics that underpin MAUT, AHP, or ANP.

It is also not the intent of this dissertation to provide a primer for the reader on the technical aspects of nuclear physics, radioactive decay, or radon fate and transport characteristics, *etc.* Certainly a solid understanding of such things, along with linear equations, matrix algebra, design of experiments, and radon would be helpful, but this dissertation is focused on MAUT, AHP, and ANP in terms of MCDM models (*i.e.,* as decision-making *tools*). To make an analogy, while it may prove helpful in certain roadside situations, one need not know every intricate technical specification of every component under the hood of a car to be able to drive one.

1.7.2. Major Assumptions of the Research

Many assumptions are footnoted throughout this work where appropriate. In addition, to such specific assumptions, the following foundational assumptions are given as follows:

1. With respect to the problem statement, it is assumed to be impossible to define the alternatives for each model with absolute certainty.

2. It is assumed that a MAUT analysis cannot accurately address the problem statement if dependent criteria are used as inputs to the model (hence the desire to find a suitable ANP-MAUT hybrid).
3. Microsoft Excel and Super Decisions (version 2.8) are assumed to be suitable DSS programs and adequate for the needs of this dissertation.
4. Conceivably, there may be several ways that MAUT and ANP can help decision-makers select a geographically appropriate location for the relative natural background value for radon; MAUT and ANP analyses have many components, and at any step along the way, the preferences and values used as inputs to those models can vary from one decision-maker to the next. An assumption is made that underlies this research concerning the concept of utility: The assumption is that MAUT and ANP, while both prescriptive decision theories grounded in utilitarian philosophy,[27] nevertheless have some intrinsic degree of subjectivity. This assumption is supported by a close examination of the St. Petersburg Paradox, [28] which is widely regarded as the origin of Utility Theory (UT). This underlying assumption persists, even noting the definition of Expected Utility Theory (EUT) given by Von Neumann and Morgenstern (1944).[29] Thus, it is assumed that the utility of individual attributes and alternatives will vary,

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[27] Utilitarian philosophy is defined as the view or belief or way of thinking that espouses the morally right action is the action that will produce the most good (Driver, 2014).

[28] The notion of utility was essentially incepted by Daniel Bernoulli's famous St. Petersburg Paradox. After going through the thought experiment, Bernoulli (and his pen pal Gabriel Cramer) concluded that different people will inevitably view a particular phenomenon differently (however slight that difference may be), and therefore, will each hold different degrees of desire for said phenomenon (Martin, 2014).

[29] In *Theory of Games and Economic Behavior*, Von Neumann and Morgenstern (1944) posited that probabilities are described as objective elements of nature that cannot be influenced by the agent of a decision (*i.e.,* a decision-maker. While this certainly cannot be argued, the assumption of this dissertation is not that the probabilities are subjective but that the perceptions of a decision-maker are; probabilities, and math in general, will unerringly be objective, but at the heart of any decision problem (and at the heart of all dissertations), it is not the math that changes, it is how the problem is stated that will dictate what the math means.

however slightly, as a function of the decision-maker's personal perceptions. The assumption extends to the value ascribed to weighting factors as well. This is true, regardless of whether it is a lone decision-maker, or a consortium of decision-makers. The key takeaway from this is that no matter what model is used, the following aspects require at least one human mind:

   a. Defining the manner in which the decision problem will be broken up;
   b. Defining the inputs used in the model(s);
   c. Assigning preferences / values of utility to each element of the problem; and
   d. Assigning values to each of the weighting factors used (if weighting factors are used in the model).

5. The comparison of two or more MCDM models can be done irrespective of how the input parameters were generated provided that the inputs used for both MCDM models are more or less the same. In other words, the focus of this research is not on the manner in which preferences, utility scores, weighting factors, or the like were elicited or selected for each model, rather, the focus of this dissertation is on the comparison of the outcomes of the models, with the assumption that they have been programmed with the same (or similar) inputs and forethought.
6. The author of this dissertation assumes, as Jacquet-Lagreze and Siskos (1981) did, that the axiomatic bases that underlie MAUT are sound, and the existence of an additive model is also assumed.
7. This dissertation holds that decision making is a problem solving activity that involves ambiguities (*i.e.,* uncertainty) and alternatives (*i.e.,* options), and different MCDM

models in the hands of different decision-makers can lead to dramatically different results (Decision Making, 2015).

1.8. Contributions to Field of Engineering Management

ODU defines engineering management as the field concerned with the application of engineering disciplines to business practices; it requires the necessary skills, knowledge, abilities, and attitudes to manage and design technology-based, project driven enterprises while exploiting the tools of management science (ODU, 2017). From this definition, and as borne out by thousands of journal articles, accredited university programs at more than a dozen institutions of higher education, and the espousal of various professional organizations, it can be soundly stated that engineering management is a broad field of study and a discipline in its own right.

Today's engineers and engineering managers are bombarded with codes of ethics, regulations, occupational and professional proficiency requirements, health and safety concerns, technical competence, legal issues, as well as the continuous improvement through science and technology. Often, engineering managers engage in work that has the potential to be dangerous. In keeping with the prime directive of all professional engineers, decisions must be made, first and foremost, with consideration of protection of public health and the environment; in engineering, as well as engineering management, safeguards are deliberately implemented to protect lives and equipment. Unfortunately, we are sometimes reminded of the price that is paid when poor decisions are made.

It is often said that decision-makers make irrational decisions. Irrational decisions tend to be more prevalent when fewer people are affected and/or the stakes are low. Finding instances where decision-makers (*e.g.,* engineering managers) lose regard for normative processes when making big decisions, especially ones that have the potential to significantly impact other parties, is somewhat elusive (Dyer, 2005).

Regulatory guidance on how to determine the relative natural background value for radon is too rigorous and too inflexible to accommodate every unique situation. In fact, in some cases, the amplitude of the natural fluctuations of radon itself is greater than the increment that would otherwise warrant a regulatory violation. The NRC openly acknowledges that regulatory "guidance is insufficient regarding surveys of radon and determinations of dose[30] to members of the public" (NRC, 2011, p. 1).

It is hoped that with time this research will be able to pave a way for a standardized approach to solve practical issues that involve environmental remediation and radioactive materials and at a minimum, will help establish a formal MCDM method for making decisions involving radon.

It is an unfortunate truth that lay members of the public are, in general, misinformed, unknowing, and/or untrusting of the facts regarding the biological effects of ionizing radiation (BEIR). Instead of attempting to convince stakeholders of the underlying technical aspects of radon exposure, it would seem a more valuable use of time to convince them of the merits associated with a formalized and established decision-making process. As Dyer (2005) put it:

> Most applications of the methods of multi-criteria decision analysis are developed for individuals who are making decisions on behalf of others, either as managers of publicly held corporations or as government officials making decisions in the best interests of the public. (p. 266)

[30] In the context of health physics, the word *dose* refers to a measure of the amount of ionizing radiation absorbed by a material or living tissue (Health Physics Society [HPS], n.d.). For more information on this topic, visit https://hps.org/publicinformation/radterms/

Decision-making has a solid place in the field of engineering management and is taught at various universities that offer engineering management programs. The connection that Decision Analysis (DA) and MCDM share with the field of engineering management is further revealed by virtue of the countless papers written to date that attest to the academic strengths and technical merits of DA and MCDM models in management science, engineering, and business. In fact, it would seem almost intuitive, if not self-evident, that the elements of strategic planning, communication, and understanding can all be improved via MCDM for applications in the field of engineering management. From Chou (2015) discussing the use ANP in improving measurement and management at a mining company to Accorsi (1999) exploring utility-based decision-making models for environmental projects; from Kabir, Sadiq, and Tesfamarian (2014) reviewing various MCDM methods for infrastructure management to Sola and Mota (2015) discussing MCDM models for energy management systems—the use of formal MCDM methods for strategic business matters and engineering applications continues to grow.

It is the intent of this research to contribute further to the field of engineering management by comparing and analyzing MAUT, AHP, ANP, and the three combinational MCDM hybrid approaches; in doing so, especially with respect to the problem statement and the case study, it is believed that new knowledge will be generated, thereby expanding the existing library of knowledge available to practitioners and professionals alike.

1.9. Clarifications and Definitions of Key Terms and Phrases

There are several key terms and phrases expressed in the problem statement, stated objectives, null hypotheses, and limitations that may require clarification. Some of these terms and phrases may have a meaning outside of this dissertation that are slightly or altogether different than the intended definition herein. Table 3 below presents these selected key terms and phrases, along with their respective definitions as used throughout the research project.

Table 3. Definitions of Key Terms and Phrases.

Word or Phrase	**Definition**
Additive Model	In MCDM / MCDA, an additive model is a decision model that combines the marginal utility scores with a weighted sum (Ishizaka & Nemery, 2013) and then aggregates those individual scores into a global score (Siebert, 2010).
Alternative	An option. The *alternatives* in a decision problem represent the possible choices from which a decision-maker may select.
Attribute	Any property or characteristic that distinguishes one alternative from another (Arsham, 2015).
ANP	A formal, RDM method that represents a subset of MCDM and exists as a more generalized form of AHP. ANP is an MCDM model that derives relative priority scales from individual judgments. The judgments expressed in the outcome represent the relative influence of one of two elements with respect to the decision-maker's preference criteria (Saaty, 2005).
Consequence	The outcome or prospects that result from a decision-maker's action(s) (Arsham, 2015).
Criterion	The standard by which alternatives are ranked, such as: cost, safety, quality, time, *etc.* (Arsham, 2015).
Decision-Maker	An individual who selects an alternative from an assortment of many alternatives when confronted with a choice. In some literature, a decision-maker is referred to as the *agent* of the decision.

Table 3 (Cont'd). Definitions of Key Terms and Phrases.

Word or Phrase	**Definition**
Dependency	In MCDM problems, dependent criteria are correlated elements that, when calculated in aggregate, would result in a biased decision. This is due to the overvalued weight that these elements will have. In the ANP model an *inner* dependency can result between two or more elements in the same cluster, and though rare, can also sometimes result in a correlation between elements in two different alternatives. An *outer* dependency is also referred to as a feedback and represents a correlation between two clusters. ANP allows these dependencies to be modeled (Ishizaka & Nemery, 2013).
Marginal Utility Score	The utility value assigned to an individual element (as opposed to the global utility score, which is the combined value of the various marginal utility scores as given by the definition of the *additive model* above).
Markov Chain	As stated by Ishizaka and Nemery (2013), a Markov chain "is a system that undergoes random transitions from one state to another with no memory of the past. This means that only the current state of the process can influence the next state" (p. 76).
MAUT	MAUT is a formal RDM method that represents a subset of MCDM. The objective of a MAUT analysis is to determine the utility of a set of alternatives by assigning an individual weight to a set of attributes which corresponds to each attribute's relative importance (Dyer, Fishburn, Steuer, Wallenius, & Zionts, 1992); thus, this technique of RDM establishes a way for a set of techniques to quantify the utility derived from individual attributes and then combines the utility from each attribute to produce a holistic measure of utility (Levin and McEwan, 2001 as cited in Hester, 2012). MAUT provides a means to break down the overall utility of alternatives into a number of preference-related attributes (von Winterfeldt & Edwards, 1986).
Pairwise Comparison	In MCDM problems, a pairwise comparison is a way of comparing alternatives and/or attributes in a decision problem, the outcome of which yields what are called *priorities*. Pairwise comparisons are the cornerstone of AHP and ANP and according to many researchers, represent a way deal with MCDM problems when a utility function cannot be constructed. Pairwise comparisons is an iterative process by which entities are compared in pairs in order to determine which entity is preferred (Forman, 1993; Saaty, 2005; Ishizaka & Nemery, 2013).
Preference	Preference is a core concept to MCDM / MCDA. Preference is the ordering or ranking of the alternatives in a decision problem. The relationship between preferences can be defined as weak or strong, and these relationships can be expressed mathematically as follows: Considering the entire set of alternatives, A, where a decision-maker has a preference relation associated with the alternatives that comprise A, and where x and y are two such alternatives in A, then the weak order between x and y is expressed as $x \preceq y$, which means the decision-maker would prefer y at least as much as x, and the strong order is expressed as $x \prec y$, which means y is preferred to x no matter how closely x might be to y. The *indifference preference relation* is thus expressed $x \preceq y \land y \preceq x$, which means the decision-maker is indifferent to x and y. Conversely, the *strict preference relation* is expressed $x \prec y \land y \nprec x$, which means the decision-maker strictly prefers y to x.

Table 3 (Cont'd). Definitions of Key Terms and Phrases.

Word or Phrase	**Definition**
Priorities	In various MCDM techniques, once a problem has been analyzed, the alternatives can be ranked. For full aggregation methods (*e.g.,* MAUT and ANP), a complete ranking can be achieved. For outranking methods, pairwise comparisons are used to establish relative degrees of preferences; *i.e.,* how much better one alternative is compared to another. When the alternatives have been ranked, *priorities* are said to have been established (Ishizaka & Nemery, 2013).
[Geographically Appropriate Location Indicative of the] Relative Natural Background Value for Radon	A representation of what the naturally occurring level or amount of radon [in air] is within a particular geographic vicinity. While the words "level" and "amount" and sometimes "concentration" are often used to describe the concept, the underlying focus always pertains to the amount of radioactivity present (due to radon and its decay products) and more importantly, the risk to humans resulting from BEIR.[31] A distinction is made between radon in air and radon in other media (*e.g.,* groundwater and geologic formations). This dissertation is focused only on radon in air, as radon behaves differently in other media.
Revealed Decision	In the field of DA, a *revealed* decision refers to the study of a decision that is already known.
Specimen [of this case study]	In this context, the word *specimen* of the case study is a specific site in the American Southwest where selection of a geographically appropriate location indicative of the relative natural background value for radon in air has been a challenging issue for several decades. The specimen offers a way to showcase the practicality of this quantitative research.[32] For the purposes of this dissertation, only a few, selected and relevant attributes were considered in testing the MAUT-ANP approach; that is to say, the specimen is deliberately established as an abstraction of what would otherwise be an extremely complicated arrangement of decision attributes and circumstantial considerations.
MAUT	MAUT is a formal RDM method that represents a subset of MCDM. The objective of a MAUT analysis is to determine the utility of a set of alternatives by assigning an individual weight to a set of attributes which corresponds to each attribute's relative importance (Dyer, Fishburn, Steuer, Wallenius, & Zionts, 1992); thus, this technique of RDM establishes a way for a set of techniques to quantify the utility derived from individual attributes and then combines the utility from each attribute to produce a holistic measure of utility (Levin and McEwan, 2001 as cited in Hester, 2012). MAUT provides a means to break down the overall utility of alternatives into a number of preference-related attributes (von Winterfeldt & Edwards, 1986).

[31] Ionizing radiation refers to any form of radiation that carries enough energy to knock one or more electrons lose from atoms or molecules such radiation may encounter, thereby creating ions. Exposure to ionizing radiation can have deleterious effects on materials and living tissue. Generally, ionizing radiation takes one of four forms: (1) alpha, (2) beta, (3) gamma, or (4) neutron. The primary mode of decay for ^{222}Rn is via alpha emission. For more information on this topic, visit http://hps.org/publicinformation/ate/faqs/whatisradiation.html

[32] The method and methodological approach involving quantitative research is discussed further in CHAPTER 3.

Table 3 (Cont'd). Definitions of Key Terms and Phrases.

Word or Phrase	**Definition**
RDM	RDM is a method for making decisions based on a set of rules, which most people would regard as sensible (Goodwin & Wright, 2014). While several other authors and subject matter experts have developed other axioms over the years, Von Neumann and Morgenstern (1944) established four axioms (*i.e.,* the aforementioned rules) that are used in DA to define rationality: 1. There must be at least two alternatives, and there must be a consequence or outcome associated with each alternative. 2. The probabilities of each consequence for each alternative can be specified. 3. The utility for all the possible consequences of any alternative can be specified. 4. A decision-maker must choose the alternative with the highest probability if two alternatives would each result in the same consequence (this is sometimes referred to as *monotonicity*). Also, if one alternative is preferred to a second, and the second is preferred to a third, then logically, the first alternative must be preferred to the third as well (this is also referred to as *transitivity*). Lastly, if the consequences of one alternative are modified in a way that yields no net difference, then both the original alternative and the modified alternative should be equally attractive.
Utility Function	A *utility function* is the expression that states than an individual's preferences between alternative solutions to a problem. Utility functions assign numbers to express the degree of desirability of a given state; accordingly, a high number correlates with a high desirability, while a low number correlates to a lower desirability. A MAUT analysis consists of a comparison of weighted, multiple attributes measured for each alternative to a problem (Dyer, 2005).

CHAPTER 2

LITERATURE REVIEW

2.1. Rational Decision Making

2.1.1. Defining Rationalism

A brief discussion concerning the fundamental underlying principles of RDM seemed a prudent place to start the *literature review* portion of this dissertation. Descriptive decision-making theories, as opposed to prescriptive ones, find their philosophical roots in the realm of psychology; prescriptive (sometimes referred to as *normative*[33]) decision theory, however, is derived from rationality and focuses on making choices that maximize benefits and minimize risks (Dyer, 2005; Decision Making, 2015).

In a simple example, if safety is the choice to be made when preparing to take a long trip, a *rational* person would choose to travel by air, rather than by car because statistically, air travel is much safer than an over-the-road trip. As another example, when deciding which bank one should choose to open a new savings account, the bank that offers the higher interest rate would be a *rational* choice, all other things being equal. There are just a few problems: First, humans are humans and rarely make rational choices. Second, real-life choices are hardly ever this simple. In real life, decisions have multiple and often conflicting attributes.

In general, RDM is characterized by identifying and accounting for alternatives, evaluating consequences from each alternative, and deciding on a course of action based on those alternatives.

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[33] Normative theory requires that decision-makers adhere to a set of rational beliefs (axioms) and that they respond to new information by conditionalization (Steele & Orri, 2015; Dyer, 2005).

RDM does not consider unquantifiable factors[34] like: ethics, loyalties, personal feelings, *etc.* (Bell, 1982; Kahneman & Tversky, 1979, 1981). As discussed by Boundless (2014), in order to make a truly rational decision, it must be assumed that the decision-maker has absolute knowledge about each alternative, as well as the cognitive ability to evaluate each choice relative to all others.

Clearly, the aforementioned could only be true in a hypothetical environment. In real-life situations, a decision-maker's rationality is said to be *bounded*, as it would be impossible to have absolute knowledge about all the aspects of any particular choice at any given time. As Dyer (2005) and Miyamoto (1992) point out, RDM is a DA process based on normative axioms; *i.e.,* prescriptive theories model a simulated universe of axiomatic parameters and provide outputs that define the way people *ought* to make decisions. Long before Goodwin and Wright (2014), Keeney (1982) pointed out that, "The purpose of prescriptive decision analyses is to provide insight about which alternative should be chosen to be consistent with the information about the problem and the values of decision makers" (p. 821).

2.1.2. Defining Utility

One of the central themes of RDM is the concept of *utility*, which fundamentally, is nothing more than a way to quantify the value of something; that is to say, it is a way to establish the desirability of the expected value of an outcome (Martin, 2014). Standing on the shoulders of Daniel Bernoulli's original *Specimen Theoriae Novae de Mensura Sortis* published in 1738, Von Neumann and Morgenstern (1944), Martin (2014), Fishburn (1973), Keeney and Raiffa (1976), and Chen and Lee (2000), along with several others too numerous to name in this context, have

[34] While true in the strictest interpretations, one of the chief advantages of MAUT is the notion that a decision-maker can ascribe a utility function to intangible and/or abstract objects. For instance, in conducting a MAUT analysis, perhaps customer loyalty is one of the attributes of a particular alternative or a particular set of alternatives. While otherwise seemingly unquantifiable, by virtue of MAUT's utility functions, this and other such attributes can ascribed a numerical value to represent their respective levels of desirability.

defined the notion of utility as a nonlinear function[35] of expected value. With respect to RDM and DA, utility can be ascribed to individual attributes, clusters of attributes, and entire alternatives.

In RDM and other prescriptive DA theories, examples emphasizing the chances of an outcome are often used as examples to convey important concepts. This makes sense because as is generally the case with real-life decisions, the outcome is unknown at the time the decision is made. (If the outcome were known, or otherwise certain, there would be no need to make a decision.) In the case of a *revealed* outcome, the objective in performing any sort of MCDA would be a retrospective exercise regardless of the objectives.

While alternatives and attributes of those alternatives maybe be fairly well defined at the time a decision is made, there are obviously going to be uncertainties associated with the outcomes of the decision. Quantifying those uncertainties can be tricky, and various techniques exist to do so; for simpler decisions, decision trees can be used to graphically represent the decision, alternatives, and probabilities associated with the outcomes. Figure 7 below illustrates a very simple decision tree.

[35] As professed in Bernoulli's famous St. Petersburg Paradox, the notion of utility is a nonlinear concept. In essence, the desirability of something increases at less than a one-for-one ratio solely by having more of that particular something. For example, while it would certainly be a rational decision, the notion of having $101 billion dollars would bring little more satisfaction than only having $100 billion dollars (to most people, that is).

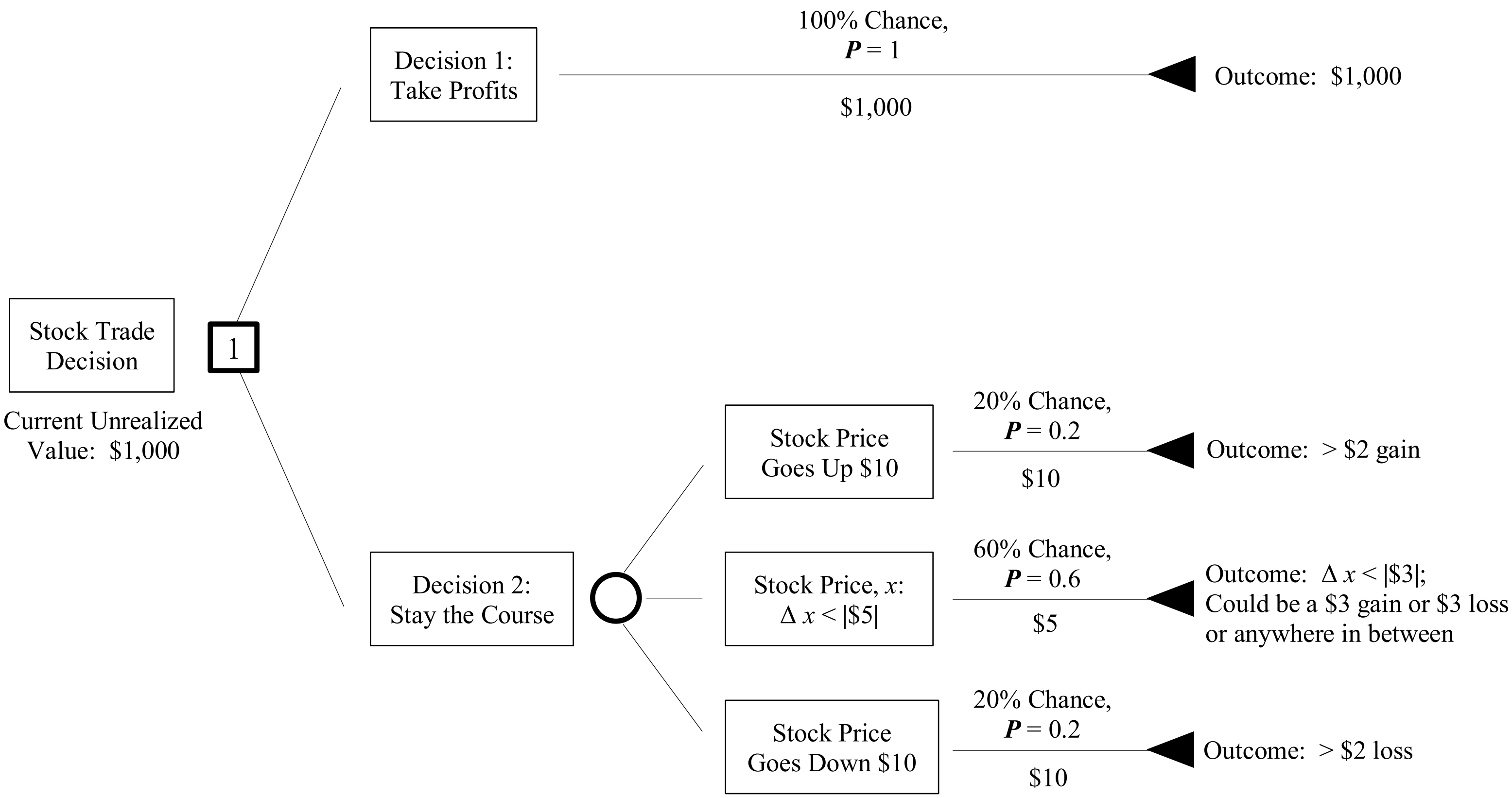

Figure 7. Typical Decision Tree Example.

In the decision tree above in Figure 7, the square node represents a decision point, whereas the circle nodes represent outcomes. The probabilities associated with those outcomes are nothing more than estimates. The financial outcome of each alternative is the product of the probability and the value associated with the alternative. In Figure 7, a simple decision is presented: Either (1) keep a stock currently valued at $1,000, or (2) sell the stock and pocket the money. Figure 7 is also useful because the underlying value of each alternative is already expressed in terms of money; that is, the value of each alternative is readily comparable and apparent. Which decision is the right answer? In order to answer that, more thought must be exerted to elaborate and define the usefulness and desirability of each alternative, along with the respective confidence levels of the probabilities associated with each alternative.

Also, in observing the decision tree illustrated in Figure 7, the over-simplification of the diagram should be apparent; in real life, there would clearly be numerous alternatives, each one with its own set of attributes, and the probability of the outcomes of each alternative would have to be calculated. Not to mention, as germane to the example shown, when specifically dealing with stock market trading, company fundamentals, technical analyses, earnings reports, commodity prices, consumer sentiment, geopolitical concerns, *etc.*, can all greatly affect the price of a company's stock. Accounting for such uncertainty is well beyond the scope of this dissertation, but the takeaway point remains the same: for nearly all real-life decisions, decision trees quickly become very messy and too difficult to map, even on the largest sheets of paper. In real life, more sophisticated decision models must be used.

2.1.3. Risk Attitudes in Decision Making

Decisions rely on the people who make them, and in real life, decision-makers are prone to their own individual attitudes toward risk and uncertainty. In order to better convey the concept of risk attitudes, consider a hypothetical card game in which a player is presented with a gamble. The rules of this hypothetical game are simple: For any given player, the game can only be played once. A player is enticed to draw the ace of spades from a fair deck of cards. If the player can draw the ace, the player wins $1,000; the player wins nothing for any card other than the ace of spades. It is assumed the cards are shuffled and indistinguishable when facedown. Alternatively, once the player has drawn her card—but before she flips it over to look at it—she can put it face down on the card table and abort the game. If the game is aborted according to the rules (*i.e.,* no peeking), the player can walk away with $10 and no questions asked. Noting this, the following RDM statements can be made:

1. The EMV to play the game to completion (*i.e.,* without aborting) is $19.23.[36] This means a rational decision-maker would never pay more than $19.23 to play this game.
2. The CE (for aborting the game) is $10, with the obvious corollary that even if the player gets scared and bails out before looking at the drawn card, she will realize a 100-percent certain net gain of $10 but in doing so, potentially misses out on the prospects of an additional $990.[37] The CE in this instance, is $10 but in reality, the CE represents any amount of money that is *guaranteed* via a decision alternative (*i.e.,* the sure money) rather than the EMV associated with a decision alternative that is at risk (*i.e.,* not guaranteed). At the stated CE of $10, the risk premium for this game would be $9.23.

[36] EMV of completing the game without aborting = ***P***(ace of spades) * MV(ace of spades) = ($^1/_{52}$) * $1,000 = $19.23.

[37] In DA, as well as several technical fields like mathematics, engineering, and formal project management, the term *opportunity cost* refers to the cost of the alternative that was *not* selected. As with many things in RDM, the answer depends on perspective and the manner in which the problem is stated. In the example above with the hypothetical card game, the opportunity cost would be: (1) $500 if the player aborts and the card subsequently turns out to be the ace of spades, (2) $500 if the game is played and not aborted and the card drawn is not the ace of spades, and (3) $0 if the player aborts the flip and the card is not the ace of spades. Consideration of opportunity costs can affect the psychological mindset of a decision-maker, and *a fortiori* can affect the attitudes exhibited toward preferences and risks.

3. However, accounting for risk attitudes means that a rational risk-averse player would accept any CE of any amount less than the EMV while a rational risk-seeking player would accept the risks of the game even if the CE were greater than the EMV. A risk-neutral player would be completely indifferent.

During the process of determining utility functions (commonly denoted as U or u), the decision-maker's attitude toward risk and preferences will be revealed. The relationship of the utility of an alternative or attribute to risk is provided by (1 below,

$$U(a) = a^r \tag{1}$$

Where: U(a) is the utility associated with an alternative or an attribute, a is the alternative or attribute of interest, and r is the risk associated with (or perceived to be associated with) the alternative or attribute of interest.

Then the utility function of any given alternative or attribute can be plotted graphically and will take one of three generic shapes. Figure 8 below depicts a simplified illustration of curves associated with the risk attitudes of decision-makers.

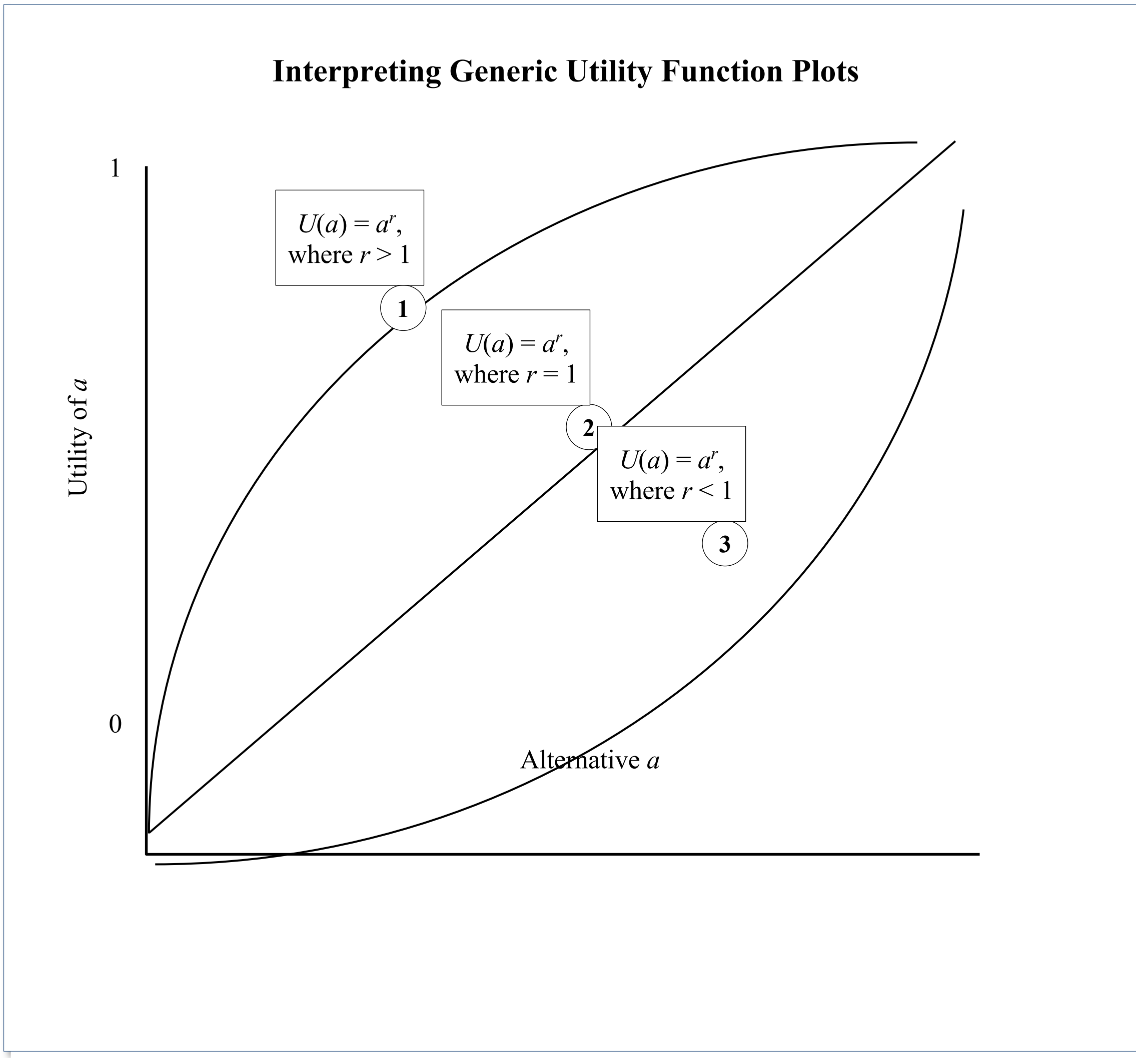

Figure 8. Generic Curves of Utility functions.

Graphically, when utility functions are plotted, they can reveal the attitude of the decision-maker with respect to risk or preference (Ishizaka & Nemery, 2013). Figure 8 above illustrates three different curves, which each one representing a different attitude: The curve labeled 1 is convex and represents a risk seeking attitude; conversely, the curve labeled 3 is concave and depicts a risk averse attitude; and the curve labeled 2 is linear and shows a risk neutral attitude.

2.2. Decision Analysis and Multi-Criteria Decision Making

In real life, decisions have multiple attributes; real alternatives are rarely independent and standalone choices—they are, more often than not, *competing* choices, and there will almost always be some sense of loss for the choice(s) not selected. "Decision analysis will not solve a decision problem, nor is it intended to. Its purpose is to produce insight and promote creativity to help decision makers make better decisions" (Keeney, 1982, p. 821), and in keeping with the non-linear and often dynamic nature of utility, it should be self-evident that real-life decisions have multiple attributes. Whether in commerce, industry, politics, or for military reasons, decision-making has become a strategic discipline. Moreover, rarely is a decision easy or simple. In fact, as Keeney (1982) points out, complex decisions often involve: multiple objectives, components with intangible utility, long time horizons, risk, uncertainty, politics, interdisciplinary substance, opinions from multiple people, and legacy issues.[38]

According to Zeleny (2009 as cited in Shi, Wang, Kou, and Wallenius, 2011), all decision making is multi-criteria. "All human decision making takes place under multiple criteria only. All the rest is measurement and search." (Zeleny, 2009 as cited in Shi, Wang, Kou, and Wallenius, 2011, p. 5). Decisions *must* be made when there are tradeoffs. For instance, if two or more things appear to be equal but only one can be selected, which one should be chosen? Such circumstances apply to nearly every real-life situation and most certainly apply to the subject matter at hand: selecting one geographic location out of many to represent the relative natural background value for radon in air.

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[38] In this context, Keeney (1982) used the phrase "sequential nature of decisions" (p. 805), which refers to the notion that decisions are almost never made in a vacuum; that is to say, that we live in an ever-evolving continuum where one decision always has future ramifications and usually leads to even more decisions.

MCDM is a robust philosophy that is supported by art as well as science and has the ability to encompass empirical, quantitative, normative, and descriptive analyses all of which are circumscribed by an element of common sense. MCDM is a structured approach to solve complex problems involving several—and often dynamic—conditions; it represents a broad category of rational decision-making techniques and itself is generally applied as a sub-discipline in the field of Operations Research (OR) (Haimes, 2009 as cited in Shi, Wang, Kou, & Wallenius, 2011). Understandably, it would almost seem impossible to conjure a decision that does not possess multiple criteria.

The formal process of MCDM is about identifying the alternatives available and then choosing the one that best fits the objectives, preferences, and values of the decision-maker (Harris, 2012). Keeney (1982), however, summed it up in more eloquent terms: "[DA is] a philosophy, articulated by a set of logical axioms, and a methodology and collection of systemic procedures, based upon those axioms, for responsibly analyzing the complexities inherent in decision problems" (p. 806).

There are many things to consider when it comes to decision-making in environmental projects: socio-political impacts, environmental health and quality, economic factors, *etc.* As noted by Yeung (2010), "Contaminated sites are always a public concern for its [*sic*] potential damage to living organisms including human beings, the ecology, the environment, and even property value" (p. 328).

MCDM has become the norm for making decisions that involve complex trade-offs between [seemingly] conflicting criteria and encompasses a wide variety of methods, like: MAUT, AHP, ANP, Measuring Attractiveness by a Categorical Based Evaluation Technique (MACBETH), PROMETHEE, Goal Programming, and Decision Evaluation for Complex

Environmental Risk Network Systems (DECERNS), just to name a few. These methods are traditionally grouped into four categories:

1. Aggregative approaches;
2. Outranking approaches;
3. Goal-oriented, aspiration, and/or reference-level approaches; and
4. Integrated approaches.

It is beyond the scope of this dissertation to go into much more detail about each of the different types of MCDM models, but suffice it to say, there are obviously advantages and disadvantages to each method and each type of approach. Certainly though, while there is no shortage of acronyms in the world of MCDM, it would seem that when attempting to find the best solution to an environmental management problem, selecting an appropriate decision-making method is the first decision to be made.

For this dissertation, MAUT, AHP, and ANP have been selected for comparison to address the problem statement. MAUT, AHP, and ANP are both considered full aggregation approaches; Table 4 helps explain why these two methods were deemed appropriate for the research at hand.

Table 4. Rational for Selection of MAUT and ANP.

Method	Noteworthy Applications	Applicability to Problem Statement
MAUT	Environmental remediation, energy management, forestry and land management, water management, financial and strategic decisions.	MAUT naturally lends its usefulness to the problem statement. The selection of a geographically appropriate location indicative of the relative natural background value for radon in air requires multiple attributes to be considered, some of which are intangible. MAUT has a tried and true history of applications in decisions that involve environmental remediation and/or contamination.
AHP & ANP	ANP is a generalization of AHP. Forestry and land management, environmental remediation, water treatment and water management are all common applications.	On the surface, ANP would seem to be a prime candidate for evaluating the problem statement; like AHP, its ability to account for dependent relationships and to rank the alternatives relative to one another means that it will not only presumably be able to show which alternative is the best but also show how each alternative compares relatively to all the other alternatives. AHP but not necessarily ANP, has been used extensively as an MCDM model for decisions involving environmental remediation and/or contamination.

Several studies have in fact been done in the area of environmental remediation using MAUT and AHP, along with a few other MCDM models (De Montis, De Toro, Droste-Franke, Omann, & Stagl, 2005; Linkov *et al.,* 2004), and a selection of these studies will be discussed later. Environmental issues have a large impact on the economy; increasing the awareness of sustainable development to political agendas has, to a large extent, revealed the level of complexity and conflicts between the varied parties (De Montis *et al.,* 2005).

De Montis *et al.* (2005) discuss the quality various MCDM methods and offer guidance for selecting an appropriate MCDM method for a given situation; they note three different MCDM quality criteria:

1. Operational components;
2. Applicability in terms of the end user (*i.e.,* the agent of the decision); and

3. Applicability in terms of problem structure (De Montis *et al.,* 2005, p. 100).

The case study of the problem statement involves an issue that has multiple attributes. Consideration must be given to the natural phenomena that affect radon levels in the natural environment, along with geological factors. In a presentation at the 2012 National Mining Association Uranium Recovery Conference, Steve Giebel, a health physicist with NRC, agreed that radon levels—especially background values—can be very complicated (Giebel and Schmidt, 2012). Indeed, it is very difficult to ascertain an accurate background level for radon because radon levels are influenced by several factors (Chambers, 2014). Aside from these natural phenomena (*e.g.,* meteorological history and trends, seasonal variations, groundwater chemistry, topography, elevation characteristics, and *etc.*), there are issues with the mensuration of radon itself. It is not as if individual radon atoms are counted—the radioactivity associated with radon has a unique energy level, like a signature of sorts. Even then, however, the entire premise of radioactive decay is based on probability (*i.e.,* quantum mechanics) (Krane, 1998). That is to say, even though it is known that ^{222}Rn has a half-life of 3.82 days (Radon, 2014), that does not necessarily mean that the exact timing of a particular nuclear transformation can be known with certainty. There are a variety of instruments used to measure radon; some do so actively and in what would appear to be real-time while others are passive and must be sent to special laboratories for proper analysis and interpretation (Hoffman, 1995; George & Bredhoff, 2011). Add to all of this the intangible value (or risk) of socio-political intervention for better or for worse, and it should be readily apparent that some of the attributes associated with the case study can be measured with a high degree of certainty while other factors would prove difficult, if not impossible, to measure.

Noting again that the primary focus of this dissertation is to compare and contrast MAUT and ANP, the usefulness of these two MCDM models in tackling the case study of the problem statement should be apparent, as both MAUT and AHP (and by extension, ANP) have a proven track record of dealing with other environmental problems that have a high degree of tangible and intangible attributes. Before discussing the case studies that were reviewed in preparation of this dissertation, a brief background on MAUT and ANP is offered to explain the fundamental concepts associated with these two MCDM techniques.

2.3. Multi-Attribute Utility Theory

2.3.1. A Prescriptive Process to Compare Apples to Oranges

In one of the first textbooks written on the subject, *Introduction to Operations Research,* Churchman, Ackoff, and Arnoff (1957) lay the foundation for MAUT and present the first usage of the simple additive model (discussed later). MAUT is indeed very useful because it prescribes a process that allows the merits of each alternative to be communicated on a single numerical scale. Using optimization algorithms, scores are developed that rate the performance of alternatives with respect to individual criteria and are then aggregated into an overall score (Linkov & Steevens, 2008). As Linkov and Steevens (2008) point out, "The goal of MAUT is to find a simple expression for the net benefits of a decision. Through the use of utility or value functions, the MAUT method transforms diverse criteria into one common scale of utility or value" (p. 816).

In other words, the MAUT method allows attributes of a decision alternative, which could otherwise have drastically diverse units of measurement, to be assigned ratings in terms of common units of utility. These attributes may be physical and substantial phenomena (*e.g.,* number of teeth on a sprocket, voltage rating of an electric capacitor, quality assigned to a particular type of lumber, weight of a tractor-trailer, cost of diesel fuel, ultra-violet reflectivity rating of a window pane, *etc.*), or to the other extreme, could even be completely abstract or insubstantial constructs (*e.g.,* the loyalty of a trusted supplier, the effectiveness of engineering managers, the satisfaction of engineering management students at a particular southeastern Virginia university, the economic health of a company, *etc.*). This characteristic is one of the chief advantages of MAUT.

As noted by Dillon and Perry (1977, as cited in De Montis *et al.,* 2005), the process of preparing a proper MAUT analysis consists of five steps. These are as follows:

1. Discretize the alternatives (*i.e.,* they need to be separate and distinct entities);
2. Determine the probability distributions for each outcome;
3. Determine the utility function for each attribute;
4. Aggregate the utility functions into a global utility value for each alternative; and
5. Choose the alternative with the highest global utility score.

MAUT is a very methodical MCDM technique and generally requires a significant amount of time to perform. Figure 9 below is a simplistic illustration of the logical progression that a MAUT-structured decision problem typically follows.

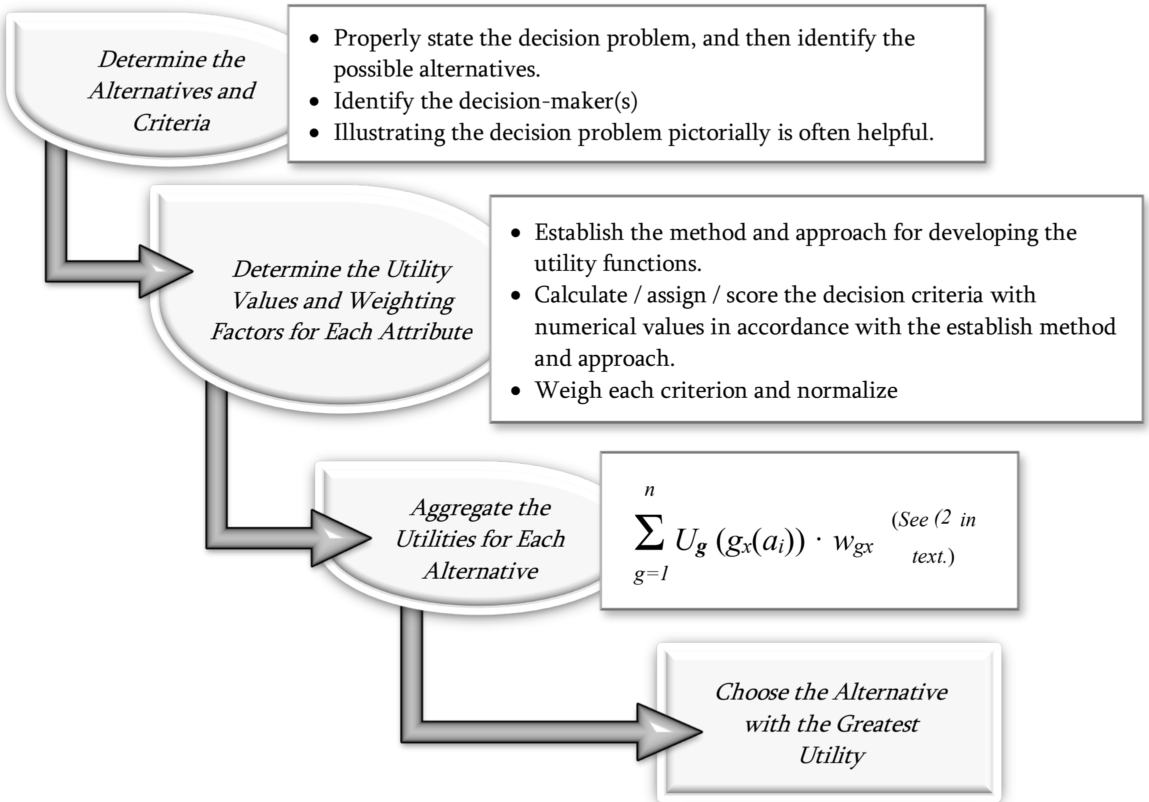

Figure 9. Typical Progression of a MAUT-Structured Decision Problem.

Above, the first step is rather straightforward: when faced with a decision problem, the decision-maker(s) must determine what the alternatives are, and they must be independent from one another. The second step[39] in the process is where more discussion is prudent for this portion

[39] While not included as a necessary step for the needs of this dissertation, some MAUT models include as a second step a requirement to determine probabilities for each outcome. Determining such probabilities relies on a certain degree of judgment and guesswork but then uses statistics to quantify the decision-maker(s)'s sentiments, with the goal to determine the probabilities of each consequence. Whether or not a model is used, information must be obtained from existing data and/or professional judgment. As Keeney (1982) pointed out, "The quantitative assessment of professional judgments or probabilities is a unique aspect of decision analysis" (p. 811). In essence, what this step implies, is that human value estimations form the base of subsequent probabilistic determinations; that is to say, while the resulting statistical probability distributions may give the appearance of indisputable math or otherwise seemingly quantitative information, underlying all of it is nothing more than the subjective opinion of one or more human minds. To make matters even more interesting, "A host of additional difficulties can occur when more than one expert is asked for professional judgments about the same events" (Keeney, 1982, p. 812).

of this dissertation. When conducting a formal MAUT, there are a few different ways to develop utility functions. These include: developing expected utility curves via comparison to certainty equivalents;[40] using probability distributions based on a referenced dollar amount and adjusting to determine equivalency;[41] as well as various (often tabular) scoring techniques, which are generally calculated based on a rigorous elicitation process. Formal surveying of a decision-maker's expertise in a particular field is of particular interest and is perhaps the most studied approach to conducting a MAUT analysis.

The third step in preparing a proper MAUT analysis relies on being able to ascribe utility values to the attributes of each alternative, whether tangible, intangible, or altogether abstract and then to combine those utility functions together into a single numerical value for the entire alternative. How is this done exactly?[42] Variants of the simple additive model developed by Churchman, Ackoff, and Arnoff (1957) have long since been developed. These methods are described in several sources, notably by Keeney and Raiffa (1976), Raiffa (1982), Farquhar (1975), Jacquet-Lagreze and Siskos (1981), and more recently summarized in Siebert (2010).

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[40] A certainty equivalent (CE) is a guaranteed return (of money) that someone would accept rather than taking a risk to obtain a greater, but uncertain gain (Investopedia, 2017a). In DA, as in financial speculation (which is a field for which DA is highly applicable), when a decision problem presents itself, a *risk premium* is offered, which represents the difference between the Expected Monetary Value (EMV) and CE. The risk premium is the minimum amount [of money] by which the EMV must exceed the CE in order to entice a decision-maker to assume the alternative with the uncertain return rather than the alternative with the guaranteed return. (Investopedia, 2017a). The risk premium will be: (1) negative for a risk-seeking decision-maker, (2) positive for a risk-averse decision-maker, and (3) zero for a risk-neutral decision-maker.

[41] Like the CE method, determining utility functions by way of probability equivalents provides statistical distributions of probable outcomes instead of known values. In this way, arbitrary dollar amounts are used as reference points against which the probabilities are adjusted until criticality (*i.e.,* indifference) is reached. Computerized Monte Carlo analyzers like those found in Microsoft Excel can generate millions of random numbers and perform these statistical comparisons, often in a matter of seconds. For the purposes of this dissertation, the math will be kept far simpler.

[42] As stated in the limitations, it is not the intent of this dissertation to critique the subjective nature of utility, or to examine the strengths and weaknesses of the various elicitation techniques associated with MAUT.

2.3.2. Human Decisions Are Inescapably Subjective

An interesting result of the elicitation process is the development (or discovery) of the decision-maker's risk attitudes toward the various elements of the decision problem. Whether the decision-maker attempts (or is prompted, by say, a third-party elicitor/analyst) to equate one or more elements of the decision problem into an EMV, or merely rates the desirability of such elements on a purely numerical scale, the idea is that a *number* will be produced that represents the *utility* of the object in question.

During elicitation, the decision-maker evaluates several questions to determine undesirable consequences and the trade-offs between potentially having things go right, versus having them not. The rigor can sometimes be increased by having an objective third-party, *e.g.,* an analyst who is separate from the decision-maker and whose function is merely to ask pertinent questions about the advantages and disadvantages associated with the various attributes, alternatives, and consequences of the decision problem (Keeney & Raiffa, 1976; Keeney, 1982). While it is true that this brings the situation back to the inescapable subjectivity expressed above concerning probability distributions, nevertheless, this is how a MAUT analysis is performed.[43]

[43] As noted by Fischer (1979), Keeney (1982), Tversky and Kahneman (1976), Kahneman and Tversky (1981), and others too numerous to list here, there is no shortage of critiques regarding MAUT's elicitation process. In fact, the subjective and often biased nature of this step in the MAUT technique is probably the most difficult aspect for true rationalists and mathematicians to accept. The aforementioned sources often cite structured approaches to counteract what could only be described as human nature, such as: adherence to a disciplined approach that checks for consistency (for instance, to check for situations when a decision-maker might deliberately inflate, understate, or altogether misrepresent the utility associated with one alternative and/or attribute in order to meet some unstated or hidden agenda); iteration; and multiple interviews with different analysts. While such techniques can certainly provide a survey of scored results which can subsequently be plotted on a bell curve, no matter how much effort is exerted, at the most basic and fundamental level, no MAUT technique can avoid the practice of quantifying the qualitative (and subjective) inputs provided by a human decision-maker.

2.3.3. An Additive Model

For the purposes of this dissertation, evaluation of the alternatives is done via an additive multi-attribute utility model. Jacquet-Lagreze and Siskos (1981), Keeney (1982), and Ishizaka and Nemery (2013) all give fairly good explanations for the mathematical underpinnings of the basic additive model used in MAUT. Concisely, and as adapted from Jacquet-Lagreze and Siskos (1981) and Ishizaka and Nemery (2013), this can be expressed mathematically with a few notations: Consider the alternatives of a decision problem that reside in a set called ***A***. Noting the strict and indifferent preference relationships,[44] these alternatives are ranked according various criteria, $g_1, g_2, g_3, \ldots g_n$, collectively called ***g***, where ***g*** itself exists as a set. For instance, when an architect wants to purchase a new drafting software program, there will inevitably be choices. The different programs available from which to choose represent the alternatives. The criteria would be the considerations the architect uses upon which to base, or ground, the alternatives. These criteria could be things like: price, disk storage space required, ease of use, terms and conditions of the licensing agreement, *etc.*

As with the alternatives, so too must the utility, U, of each criterion (denoted by $U(g_n)$) must be determined. To differentiate, the utility ascribed to a criterion is referred to as the *marginal utility*, whereas the utility ascribed to an entire alternative is referred to as the *global utility*.[45] Each criterion has a weighting factor, w_x, associated with it, that as Ishizaka and Nemery (2013) put it, represents "the amount a decision maker is ready to trade on one criterion in order to gain one unit on another criterion" (p. 83). The general form of the additive model can thus be assembled as shown by (2 below.

n

[44] *See* Table 3 for clarification on the definitions of these terms.

[45] Sometimes the *global utility* is also referred to as the *aggregated utility*.

$$\forall\ a_i \in \boldsymbol{A} : U(a_i) = U(g_1(a_i), g_2(a_i), g_3(a_i), \ldots g_n(a_i)) = \sum_{g=1} U_g\,(g_x(a_i)) \cdot w_{gx} \tag{2}$$

Where: ∀ translates as "for all cases"; a_i are the alternatives; ∈ is the symbol for "element"; ***A*** is the set; *U* is the global utility score; g_n are the criteria respective to each alternative; w_{gx} are the values for the weighting factors associated with the criteria; and *n* is the total number of terms to be summed. An English translation for the above would be as follows: For all cases where alternatives $a_{1\ to\ j}$ are elements in Set ***A***, the global aggregated utility score becomes a function of the aggregated criteria, with each criterion having been weighted by its respective weighting factor.

A restriction is placed on the use of weighting factors such that the [global] utility score of any given alternative must be between 0 and 1 (Jacquet-Lagreze & Siskos, 1981; Ishizaka & Nemery, 2013). This is referred to as the *normalization* constraint and is mathematically expressed as shown in Equation 3 below.

$$\sum_{x=1}^{n} w_x = 1 \tag{3}$$

Where: w_x is the sum of all the criteria weights and *n* is the total number of criteria weights.

The normalization constraint makes sense. What it basically implies is that when considering the set of alternatives (*i.e.,* ***A***), the sum of all the weighting factors for each of the alternatives in ***A*** cannot be greater than 1. To have a summed weight greater than one would imply that the alternatives are not independent and would therefore violate the axioms that underlie MAUT.

In MAUT, as well as most models, the impact that independent variables can have on any given dependent variable can be determined via a sensitivity analysis[46] (a.k.a., a *what-if* simulation). A sensitivity analysis is a way to determine how changes to one or more variables impact the entire outcome of a decision (Investopedia, 2017b). In turn, this exercise can help inform decision-makers which attribute has the greatest effect on the outcome of a decision.

In sum, while there are many other avenues of MAUT that could be discussed, for this dissertation, the aforementioned should suffice to provide a meaningful backdrop for the model presented in CHAPTER 3.

2.4. Analytic Hierarchy Process

2.4.1. A More Flexible Prescriptive Process to Compare Apples to Oranges

Developed by Thomas Saaty, AHP is a formal MCDM technique that can assist decision-makers when the alternatives of a decision problem cannot be easily defined (Trick, 1996); in other words, it is a useful MCDM technique when utility functions cannot be formed (Ishizaka & Nemery, 2013). Instead of ranking alternatives on an absolute scale of utility like the MAUT technique does, AHP focuses on the relative value of alternatives.[47]

[46] Decision-makers can offer a degree of ethical transparency by including a sensitivity analysis to a decision model, as it will allow others (*e.g.,* stakeholders who might be external to the decision-making process) to see the influence that the weighting factors had/can have on the analysis (MAUT, AHP, ANP, or otherwise). As the “a.k.a.” name implies, there are an infinite number of *what-if* scenarios that could be evaluated for any given problem.

[47] Relative to all the other alternatives.

AHP was the precursor to ANP, which is a more generalized form of the technique. As such, it seems prudent to at least mention a few key points about AHP before discussing the more detailed merits of ANP. There are four general steps to AHP:

1. Structure the problem correctly;
2. Elicit priorities based on pairwise comparisons;
3. Check consistency; and
4. Perform a sensitivity analysis.

Proper structuring of the problem is vital no matter which MCDM technique is used (Ishizaka & Nemery, 2013). In AHP, the problem is structured in a hierarchy, such that the uppermost element in the problem is the goal of the decision. The next level in the hierarchy represents the decision criteria. In many decision problems, there may also be subsequent levels that define sub-criteria. The lowermost level in the hierarchy defines the alternatives of the decision. Figure 10 illustrates a general depiction of an example problem structured according to AHP.

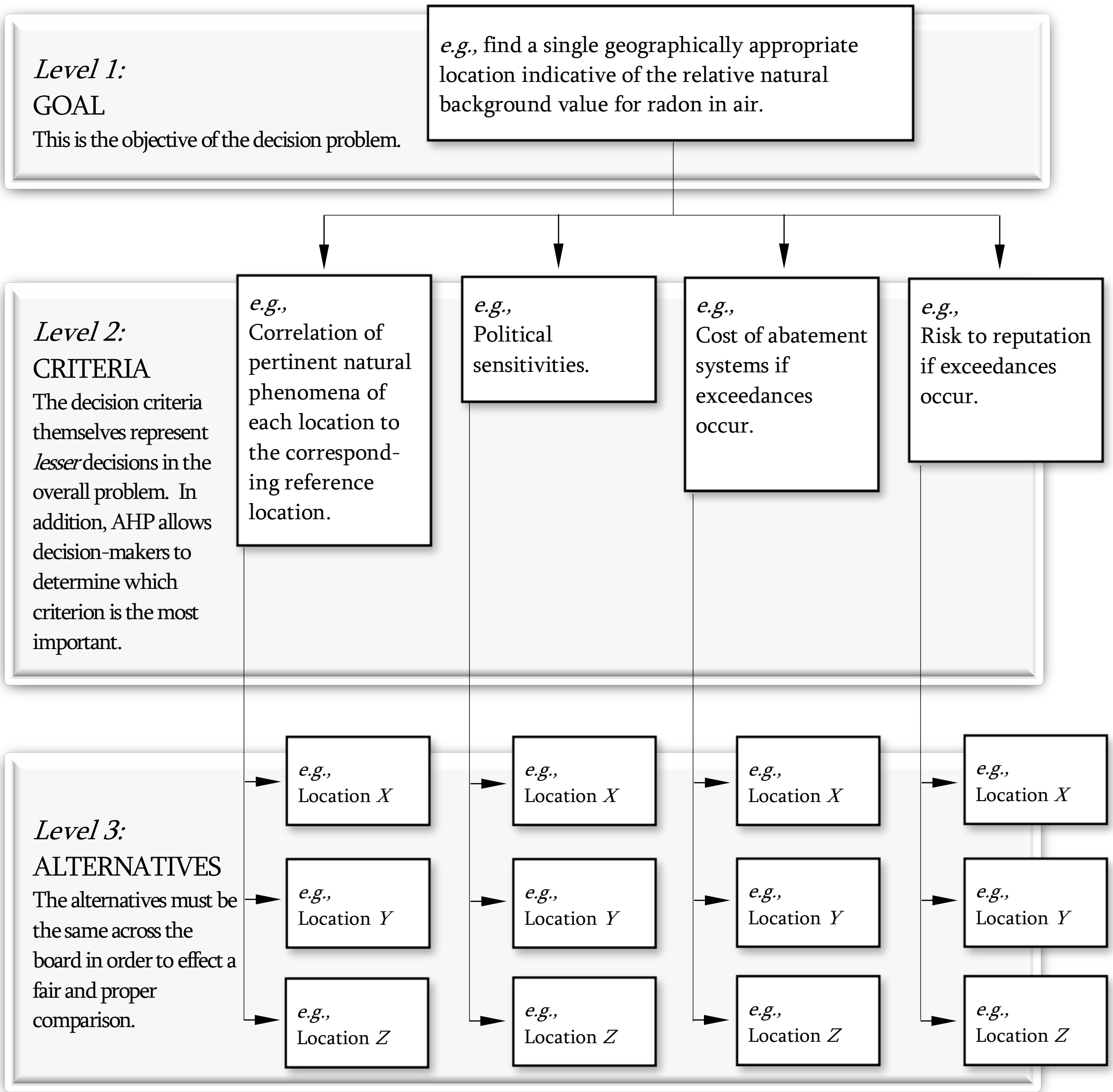

Figure 10. General Format of an Example AHP-Structured Problem.

In AHP, priorities are established for each element in a lower level to the next higher level; in turn, the local and criteria prioritizations are aggregated into a global prioritization. Once the problem has been structured, the following priorities must be calculated:

1. Criteria;

2. Local alternatives; and

3. Global Alternatives.

Criteria priorities relate the importance of each criterion to the stated objective (*i.e.,* the top level goal); local alternative priorities relate the importance of an alternative to a specific criterion; and global alternatives rank the alternatives with respect to all criteria (Ishizaka & Nemery, 2013).

2.4.2. Establishing Priorities Instead of Utility Scores

As originally used by Saaty (1980) and further defended by Saaty (1992), in the AHP model, a special scale is used to represent the decision-maker's affinity or repulsion for a given pairwise comparison.[48] The scale, which is often used in the psychological community (Ishizaka & Nemery, 2013), and is often referred to as the *Saaty Scale* in the field of MCDM, is reproduced below in Table 5.

Table 5. Saaty's Fundamental Scale for the AHP Model.

Value	**Approximate Meaning**
1	Used if two elements have *equal* importance.
3	Used to denote a *moderate* importance of one element over another.
5	Used to denote a *strong* importance of one element over another.
7	Used to denote a *very strong* importance of one element over another.
9	Used to denote an *extreme* importance of one element over another.

[48] It is important to keep in mind that during a paired comparison (*i.e.,* a pairwise comparison), elements are compared in pairs with respect to a given criterion (De Montis *et al.*, 2005). In other words, with respect to a criterion *C*, elements *x* and *y* are scored (*i.e.,* prioritized) according to the so-called *Saaty Scale*.

This scale is one of the cornerstones of AHP and offers a convenient way for decision-makers to evaluate their sentiments; values of 2, 4, 6, and 8 can also be used to offer finer expressions of priorities. When two elements *x* and *y* are scored, if *x* is compared to *y* and given a value, then *y* compared to *x* will have the reciprocal value. Table 6 below illustrates this.

Table 6. Example of an AHP Comparison Matrix Using Saaty's Scale.

	Cost	**Color**	**Size**
Cost	1	3	5
Color	1/3	1	4
Size	1/5	1/4	1

By convention, comparisons like those shown in Table 6 are read just like *x, y* coordinates on a Cartesian plane. For example, as indicated in Table 6, when reading the top row, cost is three times more important than color, not vice versa. Also, as one might intuit, a square comparison matrix like the one illustrated in Table 6 becomes exponentially[49] more difficult with each additional element. The total number of necessary comparisons, *N*, for a given number of criteria, *n*, is governed by the formula shown in (4 below, noting that in any given comparison table (like that shown in Table 6), half of the entries are merely reciprocals and not actual comparisons.

$$N = \frac{n^2 - n}{2}$$

[49] Each additional element to the matrix represents a quadratic increase.

(4)

Where: N is the total number of necessary comparisons and n is the number of criteria to be compared.

With respect to each criterion, C, a square comparison matrix, **M**, governed by (4 can be constructed. For any given component, x, two elements, a and b, are compared, where a and b assume one of the numerical values expressed in the Saaty Scale. Provided: (1) that x_{aa} and x_{bb} both equal 1; (2) that x_{ab} and x_{ba} are reciprocals; and (3) x_{ab} does not equal 0, the matrix can be expressed as shown in the general form of Equation 5 below.

$$\mathbf{M} \equiv \begin{matrix} x_{11} & x_{12} & x_{13} & \cdots & x_{1n} \\ x_{21} & x_{22} & x_{23} & \cdots & x_{2n} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ x_{n1} & x_{n2} & x_{n3} & \cdots & x_{nn} \end{matrix} \tag{5}$$

Where: **M** is the designation for the matrix and x_{11-nn} represents the entries (synonymously referred to as *elements*) of the matrix.

2.4.3. Deriving Priorities

The matrix form is appropriate and also convenient to explain the derivation of relative priorities. There are three generally recognized ways to derive the priorities in the AHP model. Table 7 below summarizes these methods.

Table 7. Priority Derivation in the AHP Model.

Method	General Concept	Comments
Approximate	This method uses a series of simple mathematical maneuvers to approximate the eigenvalues of a square matrix populated with Saaty values (or quasi Saaty values). As this method has been chosen for the needs of this dissertation, a detailed explanation and example is discussed in the text.	Simple and straight-forward approach; only calculates sums, averages, simple quotients and makes use of look-up tables.
Eigenvalue	This method computes the principal eigenvector, *v*, of the matrix and then finds the priority vector, *p*. The priority vector "expresses the priorities among the elements belonging to the same node of the hierarchy" (De Montis *et al.,* 2005, p. 110). Each component of *p* is a *local priority* of an element of the pairwise comparison.	Manual calculation is time-consuming and prone to human error; computerized calculation can be done with spreadsheets, but in order to minimize the computational time required, special software is needed.
Geometric Mean	If two elements, *a* and *b* are compared, and *p* is the priority of element *a*, and m_{ab} represents the multiplicative error, then the geometric mean is the value that minimizes the sum of the multiplicative errors of *a* and *b*.	Can usually be calculated by hand; avoids rank inconsistencies associated with the eigenvalue method (*i.e.,* the row and column geometric means provide the same ranking when the order is inversed) (Ishizaka & Nemery, 2013).

2.4.3.1. The "Eigens"

At this juncture, a seemingly ancillary discussion must be brought to the forefront, at least briefly. One of the key underlying concepts of AHP is that of *eigenvalues, eigenvectors,* and *eigen decomposition*.[50] Even though this dissertation uses the Approximate Method as mentioned above in Table 7, the math predicating eigenvalues might lie beyond the scope of this dissertation. However, a brief explanation is nevertheless offered here for the following reasons:

- To help foster a better understanding of the matrix properties that underlie AHP; and

[50] *Eigen* is a German word that, depending on context, can translate to English as "own," "proper," and "intrinsic."

- To help explain the importance of *consistency checks* in AHP, which rely heavily on eigenvalues and eigenvectors.

In dealing with matrix equations, an eigenvector[51] (commonly denoted as *v*) is a non-zero vector[52] that changes only by a scalar factor, called the eigenvalue (commonly denoted as λ), when a linear transformation takes place (Marcus & Minc, 1988; Anton, 2010). In extraordinarily simple terms, eigenvalues are the roots of the characteristic equation[53] of a [square] matrix, which is a polynomial.

If a square matrix, **M**, is multiplied by *v*, then the vector **M***v* would be equal to λ*v* (Marcus & Minc, 1988; Anton, 2010). This relationship forms the fundamental eigen equation, which is shown below as Equation 6.

$$\mathbf{M}v = \lambda v \tag{6}$$

Where: **M** is a square matrix, *v* is the eigenvector, and λ is the aforementioned eigenvalue.

The magnitude of change (*i.e.,* the modulus) of *v* is determined by λ, when it is multiplied by **M**, noting that the change can be positive, negative, and even zero[54] (Anton, 2010). There are several ways to find λ and *v* using matrix operations (*e.g.,* projections, reflections, inversions, *etc.*),

[51] Eigenvectors represent a special set of vectors used in linear equations; they are sometimes referred to as *proper* vectors or *characteristic* vectors (Marcus & Minc, 1988).

[52] In a matrix, a scalar would be a single point (*i.e.,* a number); a vector, which in the engineering and physical sciences is a value that has both magnitude and direction, is represented in a matrix by a series of numbers in a row or column; a matrix itself can also be a vector, as a matrix can exist as a single row or column.

[53] The equation for finding the determinant of a matrix is called the *characteristic* equation.

[54] If there is no change in the length after a linear transformation, then $\lambda = 1$. While an $n \times n$ matrix always has n number of eigenvalues, any or all of which may be *degenerate*, the matrix would have between zero and n number of linearly independent eigenvectors. (A degenerate eigenvector has more than one linearly dependent eigenvector, as derived from the occurrence of two or more coinciding roots of the characteristic polynomial.) (Anton, 2010).

and several formulas and methods have been developed as well, many of which can only be used in special situations. Discussion of those methods and derivations are well beyond the scope of this dissertation; for simplicity, and to bring the point home, a quick example using determinants and linear algebra is given next.

As adapted from Marcus and Minc (1988) and Anton (2010), the first step is to set the eigen equation equal to zero. (7 below illustrates this.

$$(\mathbf{M} - \lambda I)v = 0 \tag{7}$$

Where: **M** is a square matrix, λ is the eigenvalue, *I* is the identity matrix (*i.e.,* a matrix with ones (1s) along the main diagonal and zeros (0s) for all other elements), and *v* is the eigenvector.

The determinant of (7, which is given by Equation 8 below, must equal zero; if the solution to (7 is not zero, then $\mathbf{M} - \lambda I$ is not invertible.[55]

$$\det(\mathbf{M} - \lambda I) = 0 \tag{8}$$

Where: **M** is a square matrix, λ is the eigenvalue, and *I* is the identity matrix.

Finding the determinant of a very small square matrix (noting, of course, that the matrix *must* be square), where say, $n < 3$, is not too complicated. When $n \geq 3$, as is the case most of the time, especially in real-life applications, determinant calculations become very time consuming with increased risk of human calculation errors. Luckily, computer spreadsheets can do these calculations in fractions of a second and greatly reduce the likelihood of errors. In Microsoft Excel, the "=MDETERM" function can be used to find the determinant of a matrix while the

[55] Noting that a *diagonal* matrix is a matrix whose elements outside of the main diagonal are all zero (Marcus & Minc, 1988), a matrix that is not invertible does not necessarily imply that it is nondiagonalizable; and conversely, just because a matrix is invertible does not imply that it is diagonalizable. A nondiagonalizable matrix is said to be *defective* and means that it does not have a complete set of eigenvalues (Marcus & Minc, 1988; Anton, 2010).

"=MINVERSE" and "=MMULT" can be used to find the inverse and identity matrices, respectively.

(8 above will yield a polynomial; the roots of that polynomial are the eigenvalues. Since the process described herein only pertains to square matrices with *n* by *n* dimensions, then **M** will have *n* eigenvalues ("λs"), and each λ will have a *v*. If **M** is *singular* (*i.e.,* its determinant equals zero), then zero is one of the eigenvalues. If **M** is invertible, then it must be shifted by *I* to make it singular. In this case, zero would not be a value for λ. The product of *n* times λ equals the determinant of the matrix, while the sum of all the eigenvalues along the main diagonal equal the sum of the *n* diagonal elements, which is also referred to as the *trace* (Marcus & Minc, 1988; Anton, 2010).

Eigen decomposition refers to the decomposition of a square matrix, **M**, into its respective eigenvalues and eigenvectors. As adapted from Marcus and Minc (1988) and Anton (2010), the general steps to find λ and *v* can be simply stated as follows:

1. State the eigen equation and set it equal to zero.
2. Find the determinant of **M** – λ*I* by subtracting λ along the main diagonal of the matrix. The determinant will yield a polynomial with *n* number of terms, where *n* is the number of rows or columns of the square matrix, **M**;
3. Find the roots of the polynomial by setting **M** – λ*I* = 0. The roots are the eigenvalues for **M**, and make **M** – λ*I* singular; and finally,
4. Solve each λ to find its corresponding *v*. This is done via (7.

An appreciation for the value of the Approximate Method and the lightning quick calculations that computer-based calculations affords us today can be gleaned from Figure 11 and

Figure 12 below, which show a basic example of the steps required to perform an eigenvalue and eigenvector calculation manually.

How to find eigenvalues …the hard way:

Given the Square Matrix **M**, find λ and v

$$\mathbf{M} = \begin{bmatrix} 4 & 6 & 10 \\ 3 & 10 & 13 \\ -2 & -6 & -8 \end{bmatrix}$$

Step 1:
State the eigen equation and set it equal to zero

$$\mathbf{M}v = \lambda v \rightarrow \mathbf{M}v - \lambda v = 0$$

Step 2:
Find the determinant of $\mathbf{M} - \lambda I$ by subtracting λ along the main diagonal of the matrix

$$0 = \det(\mathbf{M} - \lambda I) = \left| \begin{bmatrix} 4 & 6 & 10 \\ 3 & 10 & 13 \\ -2 & -6 & -8 \end{bmatrix} - \lambda \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \right| = \begin{vmatrix} 4-\lambda & 6 & 10 \\ 3 & 10-\lambda & 13 \\ -2 & -6 & -8-\lambda \end{vmatrix}$$

"Characteristic Equation" valid for <u>any</u> $n \times n$ matrix

$$= (4-\lambda)\begin{bmatrix} 10-\lambda & 13 \\ -6 & (-8-\lambda) \end{bmatrix} - 6\begin{bmatrix} 3 & 13 \\ -2 & (-8-\lambda) \end{bmatrix} + 10\begin{bmatrix} 3 & (10-\lambda) \\ -2 & -6 \end{bmatrix}$$

$$= (4-\lambda)[(10-\lambda)(-8-\lambda) - 13(-6)] - 6[(3)(-8-\lambda) - 13((-2)] + 10[(3)(-6) - (10-\lambda)(-2)]$$

Third order polynomial equation

$$= -\lambda^3 + 6\lambda^2 - 8\lambda$$

Step 3:
Use the quadratic equation to find the values of λ.

$$\lambda(\lambda^2 - 6\lambda + 8) = 0$$

Factor out to create a second order polynomial that can be solved with the quadratic equation

Recall the quadratic equation:

$$\lambda = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Zero is the first, and most obvious value for λ:

$$\lambda = \frac{-6 \pm \sqrt{6^2 - 4(1)(8)}}{2(1)} = 2 \text{ and } 4$$

There are three values for λ: 0, 2, and 4

Figure 11. Eigenvalue Calculation Example Problem.

How to find eigenvectors …the hard way:

Step 1: Use Row Manipulations to Solve for System of Linear Equations; the goal is to manipulate the matrix rows until all elements in the last row equal zero.

Recall that each eigenvector, $\boldsymbol{v}_i$, is the simply the null space of $(\mathbf{M} - \lambda_i I)$

For $\boldsymbol{v}_1 \rightarrow \lambda_1 = 0 \rightarrow \mathbf{M} - \lambda_1 I = \mathbf{M} - 0I = \mathbf{M} = \left[\begin{array}{ccc|c} 4 & 6 & 10 & 0 \\ 3 & 10 & 13 & 0 \\ -2 & -6 & -8 & 0 \end{array}\right]$

Set Eq. 3 = 2x Eq. 3 + Eq. 1. $E_3 = 2E_3 + E_1$

$$\Rightarrow \left[\begin{array}{ccc|c} 4 & 6 & 10 & 0 \\ 3 & 10 & 13 & 0 \\ -2 & -6 & -6 & 0 \end{array}\right]$$

Set Eq. 1 = 1/4x Eq. 1. $E_1 = {}^1\!/_4 E_1$

$$\Rightarrow \left[\begin{array}{ccc|c} 1 & {}^3\!/_2 & {}^5\!/_2 & 0 \\ 3 & 10 & 13 & 0 \\ 0 & -6 & -6 & 0 \end{array}\right]$$

Set Eq. 2 = Eq. 2 – 3x Eq. 1. $E_2 = E_2 - 3E_1$

$$\Rightarrow \left[\begin{array}{ccc|c} 1 & {}^3\!/_2 & {}^5\!/_2 & 0 \\ 0 & {}^{11}\!/_2 & {}^{11}\!/_2 & 0 \\ 0 & -6 & -6 & 0 \end{array}\right]$$

Set Eq. 2 = 2/11x Eq. 2. $E_2 = {}^2\!/_{11} E_2$ & Set Eq. 3 = -Eq. 3/6. $E_3 = {}^{-Eq.\,3}\!/_6$

$$\Rightarrow \left[\begin{array}{ccc|c} 1 & {}^3\!/_2 & {}^5\!/_2 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{array}\right]$$

Set Eq. 3 = Eq. 3 – Eq. 2. $E_3 = E_3 - E_2$

$$\Rightarrow \left[\begin{array}{ccc|c} 1 & {}^3\!/_2 & {}^5\!/_2 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{array}\right]$$

Recall the general form: $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Step 2: Solve for x, y, and z.

$$x_1 = -{}^3\!/_2 y_1 - {}^5\!/_2 z_1 = {}^3\!/_2 z_1 - {}^5\!/_2 z_1 = -z_1$$

$$y_1 = -z_1,\; x_1 = {}^3\!/_2 y_1 + {}^5\!/_2 z_1 = 0$$

z_1 = Any Value

Step 3: Solve eigenvector, $\boldsymbol{v}_1$.

Let $z_1 = 1$, then $\boldsymbol{v}_1 = \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix}$

Step 4: Check.

$$\mathbf{M} \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 4 & 6 & 10 \\ 3 & 10 & 13 \\ -2 & -6 & -8 \end{bmatrix} \begin{bmatrix} -1 \\ -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \checkmark$$

…Step 5: Repeat for $\boldsymbol{v}_2$ and $\boldsymbol{v}_3$.

$$\boldsymbol{v}_2 = \begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix} \qquad \boldsymbol{v}_3 = \begin{bmatrix} -3 \\ -5 \\ 3 \end{bmatrix}$$

Figure 12. Eigenvector Calculation Example Problem.

As with most complicated and advanced mathematical computations and calculations, finding v and λ manually would be a lengthy and time-consuming process. Luckily, computers can now perform these calculations, which not only saves time but also reduces the likelihood for human errors. As alluded to earlier, there are some important reasons why the topic of eigenvectors and eigenvalues are important with respect to AHP.

First, a pairwise comparison (which lies at the heart of AHP) is nothing more than a positive reciprocal square matrix, whose elements are determined by value judgments. Second, to paraphrase Saaty (2003): in order to remain invariant under the Hierarchic Composition Principle,[56] a priority vector (*i.e.,* an eigenvector) must be able to reproduce itself on a ratio scale to preserve the strength of its preferences; this means, as a member of a ratio scale that is invariant when a positive constant coefficient is applied, one is thereby precluded from obtaining new priority vectors from a matrix under hierarchic composition (Saaty, 2003).[57] Finally, knowing (or at least understanding the underlying concept of) the maximum eigenvalue is important when it comes to calculating consistency checks, which are an integral part of AHP.

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[56] The *Hierarchic Composition Principle* is a fundamental concept in AHP and refers to the process used to obtain the overall ranks of a decision. In AHP, this is accomplished by generalizing the calculation of the principle eigenvector of a pairwise comparison.

[57] Original quote from Saaty (2003):

> Given the priorities of the alternatives and given the matrix of preferences for each alternative over every other alternative, what meaning do we attach to the vector obtained by weighting the preferences by the corresponding priorities of the alternatives and adding? It is another priority vector for the alternatives. We can use it again to derive another priority vector *ad infinitum*. Even then what is the limit priority and what is the real priority vector to be associated with the alternatives? It all comes down to this: What condition must a priority vector satisfy to remain invariant under the hierarchic composition principle? A priority vector must reproduce itself on a ratio scale because it is ratios that preserve the strength of preferences. Thus a necessary condition that the priority vector should satisfy is not only that it should belong to a ratio scale, which means that it should remain invariant under multiplication by a positive constant c but also that it should be invariant under hierarchic composition for its own judgment matrix so that one does not keep getting new priority vectors from that matrix. In sum, a priority vector x must satisfy the relation $Ax = cx$, $c > 0$. We will show that as a result of the need for invariance to produce a unique priority vector, x must be the principal right eigenvector of A and c is its corresponding principal eigenvalue. (p. 86)

2.4.3.2. Consistency Checks

In AHP, consistency checks are a required part of the decision-making process to ensure the value judgments of the decision-maker(s) do not conflate or conflict with one another. AHP, does however recognize that humans are responsible for making such value judgments and therefore does allow for some degree of inconsistency (Saaty, 2003). Mathematically, a completed square matrix for the pairwise comparison of two elements is said to be *consistent* if the transitivity and reciprocity are respected. A Consistency Ratio (CR) represents a convenient way to check for consistency.[58]

As borrowed from De Montis *et al.* (2005) and Ishizaka and Nemery (2013) (who themselves refer back to Saaty (1977)) and incorporating the guidance provided by Saaty (1977; 1980; 1992; 2003), this dissertation advocates determining the Consistency Index (CI), CR, and Random Index (RI) of a pairwise decision matrix by using Equations 9 and 10, along with the corresponding RI value from Table 8, respectively.

$$\mathrm{CI} = \frac{\lambda_{max} - n}{n - 1} \qquad (9)$$

Where: λ_{max}[59] is the maximum eigenvalue of the matrix, and n is the number of criteria of the matrix.

$$\mathrm{CR} = \mathrm{CI}/\mathrm{RI} \qquad (10)$$

---

[58] There have been a number of studies since Saaty originially published his work in 1977 that pertain to the accuracy of RI values. A few different methods have been developed (*see* Alonso & Lamata, 2006; Lane & Verdini, 1989; Donegan & Dodd, 1991; and Liu and Xu, 1987) that delve into defferent aspects of derivation, accuracy, degree of separation, usefulness, and the like. For the purposes of this dissertation, the original RI values provided by Saaty are deemed to be acceptable.

[59] λ_{max}, (commonly spoken as *"Lambda-max"*), is the largest, most dominant eigenvalue of an n x n (*i.e.,* a *square*) matrix. In many engineering applications, the λ_{max}, of a system represents the most dominant feature or mode of behavior (*e.g.,* the λ_{max} of a bridge or support column might reveal the maximum load, while the λ_{max}, of the acoustic equation for a concert hall would reveal the lowest resonating frequency. In AHP, λ_{max}, is useful, as it indicates the condition a priority vector must satisfy to remain invariant under the Hierarchic Composition Principle.

Where: CR is the Consistency Ratio, CI is the Consistency Index, and RI is the Random Index.

Table 8. Random Index Values for Selected Square Matrices, $n \leq 20$.[60]

n	RI	*n*	RI	*n*	RI	*n*	RI
1	0.0000	**6**	1.1797	**11**	1.4213	**16**	1.5078
2	0.0000	**7**	1.2519	**12**	1.4497	**17**	1.5153
3	0.4887	**8**	1.3171	**13**	1.4643	**18**	1.5262
4	0.8045	**9**	1.3733	**14**	1.4822	**19**	1.5313
5	1.0591	**10**	1.4055	**15**	1.4969	**20**	1.5371

A CR of 0.10 or less is generally considered acceptable; whereas if the CR is greater than 0.10, it is advisable to conduct new pairwise comparisons with new judgments (De Montis *et al.*, 2005). However, as Saaty (1977, 1980, *et seq.*) and Wedley (1993) point out, larger matrices ($n > 9$), are prone to CRs greater than 0.10. For larger matrices, guidance is given to keep CRs less 0.20.

2.4.4. Priorities via the Approximate Method (the Process Used in this Dissertation)

Determining priorities via the Approximate Method was chosen as the preferred approach, due to its similarities to the MAUT process of multiplying weights by their respective utility values and then aggregating them into a global score. As with the approach adopted in the MAUT discussion above, an additive model is used in the AHP approach presented herein to calculate a global ranking of alternatives.

[60] RI Values in Table 8 are derived from Donegan and Dodd (1991).

The Approximate Method is straightforward and simple. The process requires the following steps:

1. Plot out the problem statement into AHP format, consisting of a decision goal, underlain by the decision criteria and finally underlain by the decision alternatives (*see* Figure 10).
2. Perform a pairwise comparison[61] of the decision criteria; the values ascribed to the decision criteria will be used later to calculate the *weights*, but in AHP, they are referred to as *priorities* (and sometimes *priority weights*).
3. Once the pairwise comparison is completed for the decision criteria, sum each column of the matrix (*see* Table 10);
4. Produce a *new* matrix with a similar number of elements as the pairwise comparison, whose entries are populated by taking each element in the original matrix and dividing it by the sum of that element's column (*see* Table 11).
5. Calculate the average of each row in the standardized matrix. These averages represent the priority vectors (a.k.a., the priority weights)[62] of the decision model (*see* Table 12).
6. Calculate the CR of the original pairwise to help understand the level of consistency of the value judgments of the original pairwise comparison. If the CR is greater than or

---

[61] While there are a few accepted methods to determine the values for decision criteria and alternatives, this dissertation focuses on the use of pairwise comparisons using the Saaty Scale.

[62] In the AHP model, composite weights are generated for each element by multiplying the weights along each path of the hierarchy, from the top down to the final element, and then adding the resultant weights from all the paths to the element; the result is a final weight for the alternative (De Montis *et al.*, 2005).

equal to 0.10,[63] it may be prudent to revisit the original pairwise comparison to determine if the value judgments can be improved.

7. Repeat steps 2 – 6 above to determine the priority values for each decision alternative with respect to each decision criterion.
8. Aggregate the local priorities into a global priority by multiplying the priority vectors by each local priority and then summing the terms. In this way, each row will produce a global priority score. The decision with the highest global priority score is the most rational choice (*see* Eq. (**11**)).
9. Finally, perform a sensitivity analysis[64] to help explain which aspects of the calculation hold the most sway.

Table 9 below, which is identical to Table 6 above (repeated for convenience), presents a pairwise comparison for decision criteria, in this case: cost, color, and size.

Table 9. Example of an AHP Comparison Matrix using Saaty's Scale.

	Cost	**Color**	**Size**
Cost	1	3	5
Color	1/3	1	4
Size	1/5	¼	1

[63] While a CR less than 0.10 is viewed as *acceptable*, larger matrices ($n > 9$) will often exceed this value. According to Saaty (1977, 1980, *et seq.*) and Wedley (1993), CRs less than 0.20 are viewed as *tolerable*. Decision-maker judgment should be exercised to determine whether or not pairwise comparisons with CRs between 0.10 and 0.20 require additional scrutiny; CRs greater than 0.20 are viewed as *intolerable*.

[64] For the needs of this dissertation, simple sensitivity analyses have been produced for the MAUT and AHP models that compare the chosen (as-is) influencers (*i.e.,* weighting factors and priority vectors) with those of deliberately manipulated influencers. While not used in this dissertation, in-depth sensitivity analyses can be performed in Microsoft Excel via the *"Data→What-If"* function. The SuperDecisions software packages offers convenient, push-of-a-button ways to evaluate a multitude of what-if analyses. A detailed discussion of the underlying mathematical operations necessary to perform these types of analyses is beyond the scope of this dissertation.

Table 10 below illustrates the next step in the process, which is to sum each column of the matrix.

Table 10. Example of an AHP Comparison Matrix Using Saaty's Scale, Illustrating Σ_{Column}.

	Cost	**Color**	**Size**
Cost	1	3	5
Color	1/3	1	4
Size	1/5	¼	1
Sum	1.53	4.25	10.00

Table 11 below illustrates the fourth step in the process, which is to produce a standardized matrix by each element by the sum of that element's column. The new sum of each column should equal 1.

Table 11. Example of a Normalized AHP Comparison Matrix.

	Cost	**Color**	**Size**
Cost	0.6522	0.7059	0.5000
Color	0.2174	0.2353	0.4000
Size	0.1304	0.0588	0.1000

Table 12 below illustrates the fifth step in the process, which is to determine the average of each row in the standardized matrix. These values represent the priority weights; as such, the sum of all the weights should equal than 1.

Table 12. Example of Normalized Pairwise Comparison Matrix with Row Values Averaged, a.k.a., Derivation of Local Priority Vectors (PVs).

	Cost	**Color**	**Size**	**Average Value, a.k.a. Priority Weights**
Cost	0.6522	0.7059	0.5000	0.6194
Color	0.2174	0.2353	0.4000	0.2842
Size	0.1304	0.0588	0.1000	0.0964
Sum	1.00	1.00	1.00	

Table 13 below illustrates the sixth step in the process: determining the consistency of the original pairwise comparison. As shown in Table 13, it is helpful to first reproduce the original pairwise comparison, only this time, include an extra row at the top with the priority weights that were calculated in the previous step. This requires transcribing the column data into row data.

Table 13. Example of First Step in Determining Consistency Ratio in an AHP Pairwise Comparison.

	Cost	**Color**	**Size**
Priority Weights	0.6194	0.2842	0.0964
Cost	1	3	5
Color	1/3	1	4
Size	1/5	1/4	1

Next, the priority weights of each column must be multiplied by each element of that column. Once that is done, a new column can be added that represents a weighted sum, which is merely the sum of the newly found products for each row. This is depicted in Table 14 below.

Table 14. Example of Second Step in Determining Consistency Ratio in an AHP Pairwise Comparison.

	Cost	**Color**	**Size**	**Weighted Sum**
Cost	0.6194	0.8527	0.4821	1.9541
Color	0.2064	0.2842	0.3857	0.8763
Size	0.1239	0.0711	0.0964	0.2913

Finally, λ_{max} can be calculated. This is done by finding the average of the quotients of the weighted sums and the priorities. λ_{max} and can be used to determine the CI for the matrix. An easy way to arrange the table to find these figures is presented below in Table 15.

Table 15. Example of Final Step in Determining Consistency Ratio in an AHP Pairwise Comparison.

	Weighted Sum	**Priority Weights**	**Quotient**
Cost	1.9541	0.6194	3.1551
Color	0.8763	0.2842	3.0833
Size	0.2913	0.0964	3.0216
$\boldsymbol{\lambda_{max}}$	(Equals average of the quotients)→		**3.0867**

Once λ_{max} has been determined, the CI can be calculated using Equation 9. For the examples presented in the preceding tables, the CI for this matrix equals 0.0434. The only missing piece to the CR equation at this point is the value for the RI, which is found using the look-up table, which was reproduced above in Table 8. The RI for an $n = 3$ matrix is given as 0.58. Finally, using the CR Equation (*see* Eq. (**10**), the CR for this matrix equals 0.075. As this number is less than 0.10, the consistency check is successful.

This dissertation makes use of the Approximate Method (using the additive approach); as with MAUT, the local priorities must be aggregated into a global priority score. That is to say, the priorities of each alternative for each criterion must be aggregated into a global priority score, which factors in the priority weights of the applicable criteria. Also like MAUT, while there are a few exotic ways that have been developed, the traditional additive model with normalization is preferred for this dissertation. Similar to (2, but modified for priorities instead of utility functions, (11 clarifies the aggregation technique.

$$P_a = \sum_b w_b \cdot p_{ab} \tag{11}$$

Where: P_a is the global priority of alternative a, p_{ab} is the local priority of criterion b, and w_b is the weight of criterion b.

2.4.5. Some Problems with MAUT and AHP

AHP has been used in a wide range of applications and has been studied since the late 1970s, there are even ample opportunities (which will be summarily presented later) of combination approaches using AHP and other MCDM techniques. As pointed out by De Montis *et al.* (2005), "Sometimes also using other evaluation methods it is possible to make a pairwise comparison between criteria carried out in the AHP if normalized weights are required. In this sense a combination with other methods is possible" (p. 111).

Unfortunately, MAUT and AHP have sometimes been polarized into a "absolute *v.* relative" measurement argument. While this polarization is well justified, it loses sight of the real goal: MCDM models, methods, processes, techniques, *etc.* are nothing more than tools. As obvious from a plain reading of the above, MAUT makes use of an absolute judgment scale in which alternatives, criteria, and sub-criteria are ranked and weighted according to some sort of standard that has been developed or learned. In AHP, relative measurement is achieved (and assured) via the pairwise comparison: any two sub-criteria, criteria, or alternatives are only compared two at a time against a common attribute. There are advantages and disadvantages to both (*see* Table 1).

AHP suffers from the noted drawback of rank-reversal (Johnson, Beine, & Wang, 1979),[65] and there have also been other notable criticisms against AHP.[66] Borrowing from various works by Saaty over the years, the philosophical argument at the crux of the issue can paraphrased as follows: Classical Bayesian theory violates the fundamental underpinnings of its own statistics when it includes information from a previous outcome into new predictions, (a phenomenon commonly referred to as *learning*) (Saaty, 2016).

The practical takeaway from all of this, however, is that it is fundamentally flawed from the very onset for *humans* to expect to create a mathematical model that perfectly emulates *human* decision-making. There is no such thing as a perfect model; all models are abstractions of reality. Models are tools, and especially when it comes to plain language practical decisions, whether be it MAUT, AHP, ANP, or any one of the other recognized MCDM methods, the only thing the tool can do is help inform the decision-maker's judgment.

Most of the criticisms of AHP and MAUT are well beyond the scope of this dissertation, but one such criticism is very relevant to this dissertation: the inability of the AHP model to account for feedbacks. Feedbacks are also referred to as *dependencies*. Both MAUT and AHP (as well as several other MCDM models) assume that the decision criteria are independent. In real

[65] As noted by Johnson, Beine, and Wang (1979), for matrices of size $n \geq 4$, should the Saaty Scale values be replaced with their reciprocals, the resulting ranking of the priorities should also be reversed—but this is not always the case.

[66] Some of the more noteworthy criticisms of AHP include the over-reliance of quantitative methods to discern possible outcomes and the fact that desirable outcomes tend to be pre-established and therefore runs the risk of human biasing (from the decision-maker) of the pairwise comparison matrix. Several papers over the years have been written on the merits and drawbacks of AHP; for additional information, consult: Saaty (2005), Dyer (2005), Whitaker, (2007); Barzilai (1998); and Forman (1993).

life, things are hardly ever so neatly arranged—generally speaking, in real life, *everything* is dependent on everything else somehow, some way. For example, if one is trying to determine a geographically appropriate location indicative of the relative natural background value for radon in air, the criteria of wind speed is correlated to the measured radon level. Not accounting for these dependencies would mean that a heavier weight of these joint criteria would result and would therefore introduce bias into the decision process. Luckily, there is an MCDM model that can account for these dependencies: ANP.

2.5. Analytic Network Process

2.5.1. A Prescriptive Process that Helps Address the Bias in Apples-to-Oranges Comparisons

While in AHP the focus is on determining preferences and priorities in linear fashion, in ANP, the focus is on determining the relationship of a network structure and the degree of interdependence. The chief advantage of ANP is its ability to make predictions by using ratio scales to capture various kinds of interactions (Saaty, 2016). ANP is often referred to as a generalization of AHP because it models interdependencies without a need to specify hierarchical levels (Sipahi & Timor, 2010). ANP model building requires elements to be defined and assigned to clusters, as well as a vectored definition of the relationships between them (Sipahi & Timor, 2010; Saaty, R., 2016; Saaty, T., 2001).

Figure 10 in the section above illustrated the hierarchies associated with the AHP model; the hierarchies of AHP related the alternatives, criteria, sub-criteria,[67] and decision goal linearly. As noted by Ishizaka and Nemery (2013), the model ceases to be linear once “dependencies arise between any of the elements in the decision problem” (p. 59). Consider the following examples to help explain the reason why dependencies are problematic.

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[67] Sub-criteria were not shown in Figure 10 for the sake of simplicity.

For the first example, consider a very simple decision problem in which a regulatory agency wants to purchase new radon detectors. The objective (*i.e.,* the goal) of the decision is to buy the *best* new detectors for the department. For the sake of simplicity, this example will only focus on three criteria: cost, accuracy, and ease of use. Again, for simplicity, there are only two different types of detectors being considered: (1) the WammoDyne Radon Sniffer, and (2) the Radonomatic Detector 9000. Some pertinent information for this hypothetical example is provided in

*Table **16*** below.

Table 16. Decision Information for Hypothetical Radon Detectors.

Model	Cost per Unit	Accuracy	Ease of Use
WammoDyne Radon Sniffer	$3,400 / ea.	99%	Skilled Technical Operator with Specialized Training Required
Radonomatic Detector 9000	$2,000 / ea.	70%	Minimal Training Required

As may be intuited from the information given, the ease of use is completely independent of the accuracy of the instrument. In other words, the instrument will perform with its stated accuracy whether or not a high skilled operator or a layman is using it (though if a highly *un*skilled operator subsequently breaks the instrument, it may not function with the stated accuracy but that is a different decision problem to solve). Cost, on the other hand, appears to be correlated to the accuracy of the instrument, even though sufficient information was not provided in the example to be able to know that with certainty. Also, while there may appear to be some sort of relationship between cost and ease of use, it would be counterintuitive to think that one would want to pay more money for a device that is more difficult to use. So, which model is the *best* new one to buy for the agency? As always, the answer is: it depends.

In the AHP process, the hierarchy might look something like that shown in Figure 13 below.

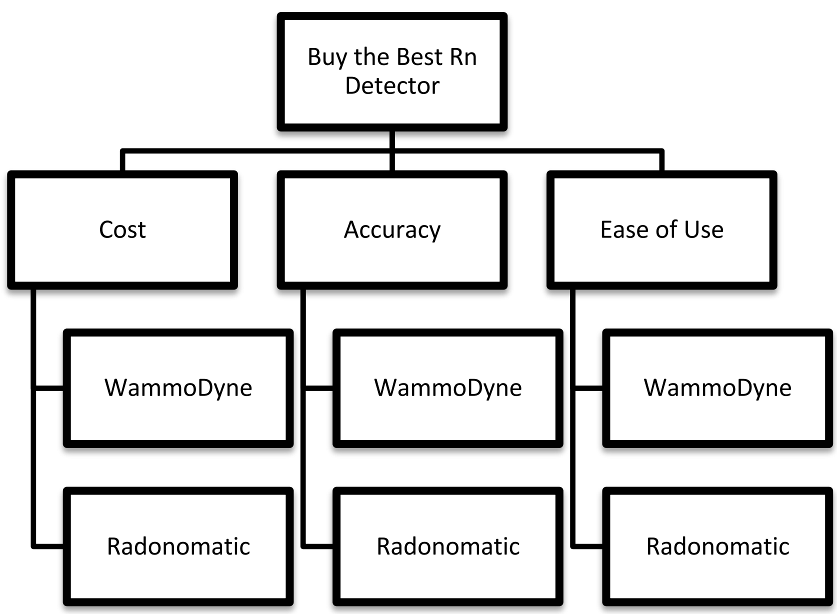

Figure 13. AHP Hierarchy for Hypothetical Radon Detectors Decision Problem.

The problem is, the AHP model cannot account for any dependencies that may exist between cost and accuracy. In ANP, instead of using levels, nodes and clusters are used. Accordingly, in the ANP model, Figure 13 might be redrawn to resemble something like that shown in Figure 14.

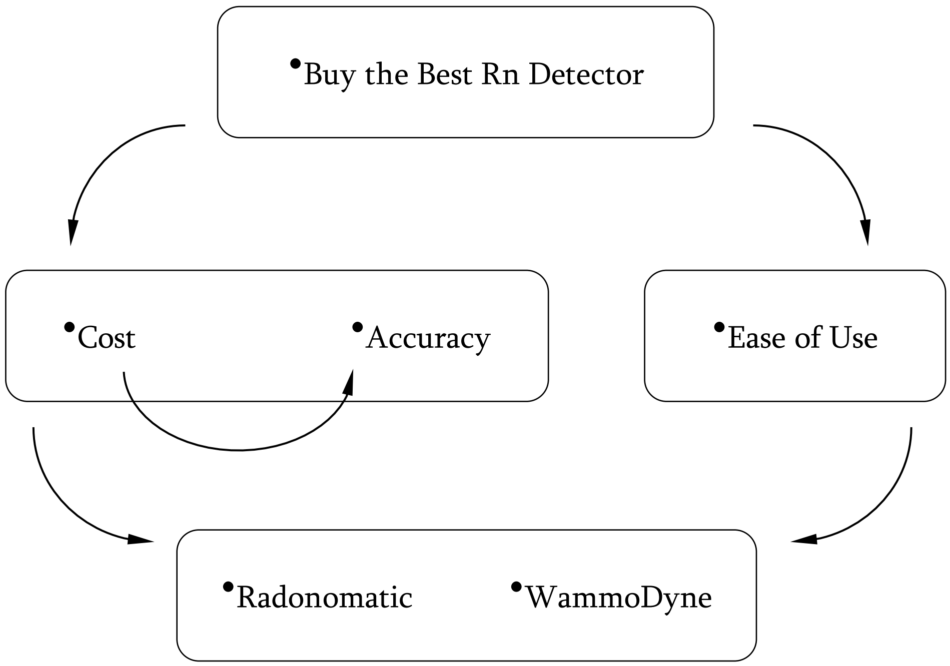

Figure 14. ANP Clusters and Loops for Hypothetical Radon Detectors Decision Problem.

As illustrated in Figure 14, instead of levels, the focus of the ANP model is on the relationship between the clusters and loops. Note the loop that indicates the relationship between cost and accuracy. In the AHP model, priorities would be established based on the hierarchical levels illustrated in Figure 13. If equal weights were ascribed to each of these criteria, it would be impossible to account for the overlap that is due to the association between cost and accuracy.

2.5.2. Solving MCDM Problems with ANP

For the needs of this dissertation, SuperDecisions (version 2.8) has been chosen to solve the problem statement via ANP. SuperDecisions has a few advantages and meshes very nicely with the DSS used in this dissertation to model the problem statement via AHP. Thomas and Rozann Saaty are the creators of SuperDecisions, and even using SuperDecisions, the first step is to structure the problem in AHP format. Thus, there is a very easy segue that can be made in this dissertation by taking the AHP model created in Microsoft Excel and transferring the necessary inputs into SuperDecisions for further analysis via ANP.

In general, ANP models share three common parts:

- The criteria against which a decision is evaluated (just like in AHP);
- A network of influences for and between each criterion, sub-criterion, alternative, and cluster of any of the above; and
- A global aggregation to synthesize the priorities and determine the best score (just like in AHP).

In the previous example, it would be impossible to know how much of the cost criterion is overlapping in the judgment of the decision-maker(s) with respect to the accuracy criterion. This type of dependency is referred to as an *Inner Dependency (I)* and is characterized by a correlation of elements in the same cluster. There is a second type of inner dependency, called an *Inner Dependency (II)*; this refers to a dependency that might arise in the alternative cluster. Both types of inner dependencies can be accounted for in the ANP model by virtue of using additional specialized matrices that aim to answer additional—and more specific—questions about the decision problem. There is a third type of dependency, called an *Outer Dependency*, which refers to a correlation between two clusters and, more specifically, where the weight of the criteria depends on the alternatives and not the goal (Ishizaka & Nemery, 2013). As with inner dependencies, this type of dependency can be accounted for using additional matrices as well, the difference is, in this case, a new *intermediate* goal must be added in order to break the problem up into more manageable chunks.

As borrowed from Saaty (2016), an outline of the steps used to solve ANP problems using SuperDecisions is presented below in Table 17.

Table 17. Steps to Solve MCDM Problems Using ANP.

Step	Description	Notes
1	Properly state the decision problem.	Provide a contextual narrative that describes the criteria, sub-criteria, and perceived influences that may determine how the decision-making process may unfold.
2	Determine the control criteria.	ANP makes use of four control hierarchies: benefits, costs, and risks.
3	Determine general network of clusters and their elements.	Arrange clusters and elements in a convenient and readily understandable way.
4	Determine the general feedback arrangement.	With respect to each control criterion or sub-criterion, connect the elements according to their outer and inner dependencies.
5	Determine the approach for analyzing influences.	This step is a formality to determine how the analysis reports the results (doing the influencing or being influenced by) in terms of elements and clusters with respect to other elements and clusters.
6	Construct the supermatrix for each control criterion.	This is similar to the model synthesis / global aggregation process in AHP.
7	Perform pairwise comparisons on the elements within clusters with respect to the influence they have on elements in other clusters to which they are connected.	Comparisons should be made with respect to the degree to which one element influences another element according its respective control criterion or sub-criterion.
8	Perform pairwise comparisons between the clusters that are connected.	The derived weights are then used to weight the elements of the corresponding column blocks of the *supermatrix.*

Table 18 (Cont'd). Steps to Solve MCDM Problems Using ANP.

Step	Description	Notes
9	Compute the limit priorities of the stochastic matrix.	SuperDesicions software will do this automatically.
10	Perform a sensitivity analysis.	SuperDesicions software will do this automatically.

2.6. Dissertation Literature Review: Case Studies using AHP, MAUT, and ANP

Several studies have in fact been done in the area of environmental remediation using MAUT and AHP, along with a few other MCDM models (De Montis, De Toro, Droste-Franke, Omann, & Stagl, 2005; Linkov *et al.,* 2004), and a selection of these studies will be discussed later. Environmental issues have a large impact on the economy; increasing the awareness of sustainable development to political agendas has, to a large extent, revealed the level of complexity and conflicts between the varied parties (De Montis *et al.,* 2005).

There are many things to consider when it comes to decision-making in environmental projects: socio-political impacts, environmental health and quality, economic factors, *etc.* As noted by Yeung (2010), "Contaminated sites are always a public concern for its [*sic*] potential damage to living organisms including human beings, the ecology, the environment, and even property value" (p. 328). Additionally, in recent years, researchers have increasingly been combining two or more MCDM methods to create more successful models (Sarul & Eren, 2016).

Thus far, the previous discussion has focused on a review of the available literature primarily covering the fundamental philosophies, theories and even some of the mathematical and technical tenets (albeit only at a high level) that underlie MAUT, AHP, and ANP. In an effort to round out the literature review, it now seems prudent to build upon the fundamentals which have been discussed, and present the works of others who have used MCDM techniques in ways similar to that which is sought to be used in this dissertation.

Table 18 below presents selected case studies that have been reviewed and are believed to best represent studies that most closely approximate the type of research undertaken in the course of this dissertation. A formal screening method was not developed or employed to filter relevant studies, rather, relevancy was based on the interpreted degree of congruency between the identified literature and the scope, purpose, problem statement, and topics discussed in this dissertation (*e.g.,* MAUT, AHP, ANP comparisons, combinational MCDM hybrid approaches, MCDM techniques used in environmental management, environmental remediation, and engineering management applications, *etc.*). There are two important things to note about the information presented in Table 19: First, in total, more than a thousand journal articles, conference proceedings, books, and websites were perused during the course of this dissertation's research, inclusive of but not solely limited to the literature review portion. What is presented in Table 19 below is merely what this author believes to be the most relevant studies that were identified. Second, after an extensive, if not exhaustive literature review, not a single study was found that captured the same scope or purpose of the research herein presented, nor one that specifically addressed this dissertation's problem statement. On all counts, the research of this dissertation is believed to be further bolstered in terms of uniqueness and originality.

Table 19. Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
The Comparison of MCDM Methods including AHP, TOPSIS and MAUT with an Application on Gender Inequality Index | (2016)	Sarul, L. S. & Eren, Ö.	MAUT–AHP & AHP–TOPSIS	***Relevance:*** *A comparison of various MCDA methods.* | **Comments:** This paper discussed a comparison of MAUT, AHP, and TOPSIS with a focus on gender inequality, primarily focusing on the geographic are comprised by European Union countries. The objective of the paper was to show that gender inequality was an indicator of the level of [human] development in a particular country but proposed to use MCDM as an alternative means to reclassify the different weights for each indicator used by traditional *non*-MCDM methods.
Preference-Based Interpretation of AHP | (1995)	Lai, S.	MAUT–AHP	***Relevance:*** *A comparison of various AHP and MAUT; AHP is the precursor to ANP, so there exists an intuitive interest for this journal article.* | **Comments:** This paper explored the relationship between AHP and MAUT, focusing on simple three-level hierarchic structures (like those shown in Figs. 9 & 10, where $n = 3$) and concluded that under certain conditions, both MAUT and AHP can result in a consistent preference structure.
Criticisms of the Analytic Hierarchy Process: Why they Often Make No Sense | (2007)	Whitaker, R.	AHP	***Relevance:*** *This publication is a critique of other critiques of the AHP, and it is always good to understand criticisms of a theory or practice.* | **Comments:** As somewhat of a guarded "check" on behalf of this author, it made sense to include this journal article as part of the focused literature review. Whitaker (2007) examined several other papers critical of AHP, and why, in her view, those critiques fell short. The takeaway from the paper is that problem structuring is crucial to be able to adequately set priorities and derive meaningful, real-world results. The guidance given in Whitaker (2007) was not only deemed important enough to include in this table but also weighed heavily during the construction of the ANP-MAUT model presented in this dissertation.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Evaluating a Framework for Multi-Stakeholder Decision Support in Water Resources Management | (2001)	Hamalainen, R.P., Kettunen, E., and Ehtamo, H.	MAUT–AHP	***Relevance:*** *The comparison between the two MCDA techniques made Mamalainen et al. (2001) of particular interest to the literature review of this dissertation.* | **Comments:** Hamalainen *et al.* (2001) primarily focused on an important environmental decision that involved the flow of impacted water into a surficial waterway system in Finland. Of interest, Hamalainen *et al.* (2001) was focused more on environmental policy and problem structuring than on any specific comparison between AHP and MAUT.
Multi-Criteria Decision Analysis: A Framework for Structuring Remedial Decisions at Contaminated Sites | (2004)	Linkov, I., Varghese, A., Jamil, S., Seager, T., Kiker, G., and Bridges, T.	MAUT, MAVT, AHP, Framework for Responsible Environmental Decision Making (FRED), Simple Multi-Attribute Rating Technique (SMART), Environmental Restoration Priority System (ERPS), Risk Based Prioritization (RBP),	***Relevance:*** *Direct comparison between AHP and MAUT, with the added element of subject matter focus on environmental decision making.* | **Comments:** This well-written paper offers a review of the implementation and application of several MCDA models at environmentally contaminated sites across the U.S. and a few in Europe. A summary recounting of the role of MCDM in the decision-making processes of various agencies is presented, including: EPA, DOE, DOD, the US Army Corps of Engineers' Institute of Water Resources, the European Commission, and the International Institute for Geo-information Science and Observation, just to name a few. Even though this paper discusses several individual environmental projects and programs, and the use of various MCDM methods used at various sites, not a single one of the projects mentioned covers the selection of a geographically appropriate location indicative of the relative natural background value for radon (or anything to do with radon for that matter), nor do any of the topics discussed in this paper cover any sort of hybrid ANP–MAUT model or a comparative analysis of MAUT and ANP. Nevertheless, this informative paper provided a very insightful focus for the literature review of this dissertation.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Integrating Multi-Criteria Analysis and GIS for Land Condition Assessment: Part 2 – Allocation of Military Training Areas | (2002)	Mendoza, G.A., Anderson, A.B., and Gertner, G.Z.	AHP and Geographical Information Systems (GIS)	***Relevance:*** *This paper was deemed useful and pertinent to this dissertation because of the common element of land characterization.* | **Comments:** This paper focused on traditional spatially-related decision problems, which typically involve a several feasible alternatives and multiple, conflicting evaluation criteria with various incompatible units of measurement. Accordingly, many such decision problems make use of GIS-based multi-criteria decision analysis (GIS-MCDA). GIS is generally recognized as a decision support system while MCDA, obviously, provides a useful array of techniques and procedures for structuring decision problems and prioritizing alternative decisions. Mendoza *et al.* (2002) focused primarily on AHP and its hybridization to GIS-based decision models.
Landfill Siting Using Geographic Information Systems: A Demonstration | (1996)	Siddiqui, M., Everett, J., and Vieux, B.	AHP and GIS	***Relevance:*** *There are common elements between this dissertation and Siddiqui et al. (1996), as both landfill siting criteria and the establishment of a geographically appropriate location indicative of relative natural background value for radon both involve several conflicting and disjointed evaluation criteria, as well as the forced comparison and relation of elements with incompatible units of measurement.* | **Comments:** This paper was a practical account of a real-life spatially-related MCDM problem that played out using GIS and AHP to site a landfill. Siddiqui *et al.* (1996) focused primarily on GIS and AHP as the means to solve the landfill problem. No mention of comparison between other MCDM methods was discussed, nor was there any meaningful accounting in the decision problem for the *softer* attributes of the decision problem (*e.g.,* socio-political repercussions, corporate reputation, *etc.*).

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Application of Multicriteria Decision Analysis in Environmental Decision Making | (2005)	Kiker, G.A., Bridges, T.S., Varghese, A., Seager, T.P., and Linkov, I.	MAUT, AHP, and Outranking approaches	***Relevance:*** *As accounted for in Kiker et al. (2005), the three keys to success are: people, process, and tools. This is germane to one of the underlying themes of this dissertation, which is the notion that even though prescriptive decision theory does not analyze the psychological reasons why people make decisions, the fact of the matter is, people are involved in decisions. As a prescriptive approach, rather than looking back and analyzing why a decision was made, the concept of synthesis in this context, places the function of people and their personalities as part of prescriptive approach. That is to say, having the correct combination of people is the first step in the decision process described by Kiker et al. (2005).* | **Comments:** Kiker *et al.* (2005) presents a review of the available literature and discusses recommendations for the practical application of MCDM techniques in environmental projects. Of interest, Kiker *et al.* (2005) also explored the concept of *Synthesis of Decision-Making Concepts*, which gives and insightful account of the three key components that must be integrated in order to maximize the likelihood of success when dealing with environmental decisions. As informative as Kiker *et al.* (2005) is, like many other reviews, it merely provides a detailed description of the suitability and appropriateness of various MCDM methods with respect to various categories of environmental decision problems. That is to say, while the paper does discuss various MCDM methods, it does not offer any comparison between the methods, it merely explains the usefulness of each method for specific types of environmental problems.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
A Critical Review of Multi-Criteria Decision Making Methods with Special Reference to Forest Management and Planning | (2009)	Ananda, J. and Herath, G.	Various	***Relevance:*** *As purely a review of other studies, Ananda and Herath (2009), as cited elsewhere in this dissertation, is a well-written paper that highlights the use of various MCDM methods in a multitude of environment-related decisions, especially those that pertain to forest management.* | **Comments:** None.
Making Decisions with Multiple Attributes: A Case in Sustainability Planning | (2012)	Hahn, W. J., Seaman, S. L., and Bikel, R.	MAUT	***Relevance:*** *While Hahn, Seaman, and Bikel (2012) focuses primarily on MAUT, it involves the elements of sustainability, which is relevant in the field of environmental planning. Additionally, this article discusses methods for inputting qualitative and quantitative factors into the decision model.* | **Comments:** None.
MCDM Methods in Strategic Planning of Forestry on State-Owned Lands in Finland: Applications and Experiences | (2001)	Kangas, J., Kangas, A., Leskinen, P., and Pykalainen, J.	MAUT, AHP, and Outranking approaches	***Relevance:*** *This journal paper written by Kangas et al. (2001) is of particular interest to this dissertation because of its direct attempt at MCDM hybridization.* | **Comments:** Unlike several of the other articles researched during the course of this dissertation's literature review which merely *review* a multitude of MCDM papers and then categorize them according to subject matter and the respective type of MCDM used, Kangas *et al.* (2001) actually evaluates an AHP model that is adjoined by a SWOT analysis to improve the decision-making process. Additionally, as stated in the paper's abstract, "As a conclusion, the use of more than just one MCDM method in a single planning process is seen usually recommendable. In addition, developing hybrid MCDM methods is regarded as a potential direction for future research" (Kangas, *et al.,* 2001, p. 257). Such words were obviously encouraging during the course of this dissertation's literature review.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Multicriteria Decision Analysis and Participatory Decision Support Systems in Forest Management | (2017)	Acosta, M., and Corral, S.	AHP, SWOT, Linear Programming, and others	***Relevance:*** *In similar context to this dissertation, Acosta and Corral (2017) provides a look at a hybrid MCDM approach that also involves a decision problem requiring the selection of a particular geographic alternative.* | **Comments:** This journal article offered a perspective of MCDM methods in the context of Decision Support Systems (DSSs), which have arguably been used in some form or another since the 1960s. Within the context of forest management, Acosta and Corral (2017) provides a review of various other MCDM-related articles and discusses what made those articles compelling or otherwise interesting. Of particular interest, was the way Acosta and Corral (2017) paraphrased another article by Zhang, Sherman, Yank, Wu, Wang, Yin, Yang, and Ou (2013), which essentially stated that combining MCDM methods with GIS systems makes it convenient and simple to understand the results of decision assessments by geographically correlating the location social actors (and their respective opinions), which thus allows thematic maps to be created with respect to the data obtained. Those maps can then be stored and presented in numerical layers which can help decision-makers in a multitude of ways during the decision-making process. The value of such a geographic approach with respect to the topic of this dissertation should be clear.
Model World: The Great Debate—MAUT Versus AHP | (2005)	Gass, S. I.	MAUT and AHP	***Relevance:*** *This article by Gass (2005) is an often-cited journal article that compares and contrasts two of the most well-known MCDM methods: MAUT and AHP.* | **Comments:** While not particularly useful as a basis to form hybrid MCDM models, it nonetheless provides a good basis to understand the key tenets and colleges of thought regarding these two MCDM models.

Table 18 (Cont'd). Literature Review.

Title **| (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation*** **| Comments**
Differences in Prioritization of the BSC's Strategic Goals using AHP and ANP Methods | (in press)	Janeš, A., Kadoić, N., and Begičević, R. N.	AHP, ANP, Balanced Scorecard (BSC), and ANP-BSC Hybrid	***Relevance:*** *This paper compares and contrasts the derivation of priorities between BSC, ANP, and AHP, and provides a useful base for ANP-hybrid modeling, which has obvious relevance to the needs of this dissertation.* | **Comments:** Plainly written and easy-to-understand.
Tackling Uncertainty in Multi-Criteria Decision Analysis – An Application to Water Supply Infrastructure Planning | (2015)	Scholten, L, Schuwirth, N., Reichert, P., and Lienert, J.	MAUT / MAVT	***Relevance:*** *Even though this paper by Scholten et al. (2015) did not necessarily compare two or more different MCDM methods, it was still a useful journal article germane to this dissertation, in that its subject matter pertained to water management systems, which is still within the realm of using MCDM to make environmental decisions.* | **Comments:** Uncertainty is always an issue with any MCDM problem. Scholten *et al.* (2015) define uncertainty as the unknown portions of a problem (*e.g.,* preferences, weights, and other assumptions, *etc.*) which, when aggregated, can result in divergent or otherwise dissimilar recommended courses of actions from one decision-maker to another. In this context, uncertainty was minimized by doing some up-front research of the problem, ranking decision preferences and generating rationality assumptions. Once that was done, the research team followed-up with an online survey, and finally with face-to-face interviews between decision analysts and affected stakeholders. At each step of the way, the uncertainty calculations were recalibrated with the newly gleaned information. Preference modeling was performed similar to that used by most commercially available MCDM software programs.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Remediation Technologies for Contaminated Sites | (2009)	Yeung, A. T.	EPA-Developed Methods	***Relevance:*** *^{222}Rn is ubiquitous in earth's crust due to the presence of ^{238}U, and more directly, ^{226}Ra. Depending on the quantities involved, a site where an anthropogenic activity has concentrated ^{238}U or ^{226}Ra in soil could be considered a contaminated site. All parent isotopes present in the ^{222}Rn decay chain are metals, and aside from situations where these isotopes bond to airborne dust, these particles are most likely deposited in the ground; these parent isotopes are considered "sources" of ^{222}Rn. Removal of these parent isotopes (i.e., contaminants) from the soil would be considered one method to achieve remediation.* | **Comments:** Yeung (2009) presented an overview of in-situ and ex-situ remediation techniques at various contaminated sites. While the specific concerns would obviously vary from site to site and from project to project, whether the contaminants are ^{226}Ra, hexavalentchromium, or polychlorobiphenals, there are clearly generalities that can be intuited in terms of overall remediation techniques.
MAUT Approach for Selecting a Proper Decommissioning Scenario | (2007)	Kim, S. K., Park, H. S., Lee, C. H., and Jung, C. H.	MAUT–AHP	***Relevance:*** *Like this dissertation, a hybrid approach between two different MCDM methods was used.* | **Comments:** This conference paper by Kim *et al.* (2007) was particularly interesting during the course of this dissertation's literature review for a few reasons: First, the specific topic of the paper dealt with a decision that involved a decommissioning scenario, which is very much an example of decision-making in the field of environmental management. Second, and more interestingly, MAUT was actually the MCDM model of choice that the researchers chose, but they used AHP to determine the weighting attributes.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
A Hybrid Approach Based on ANP and Grey Relational Analysis for Machine Selection | (2017)	Kabak, M., and Dağdeviren, M.	ANP, AHP, and Grey Relational Analysis (GRA)	***Relevance:*** *This publication is very relevant to this dissertation's core scope, in that it attempts to combine two MCDM approaches, namely ANP and GRA. Specifically, it attempts to use ANP-derived weighting factors as inputs into GRA, which is strikingly similar to what this dissertation attempts to do with ANP and MAUT.* | **Comments:** There are some notable questions regarding Kabak and Dağdeviren (2017), and the mechanics of the authors' hybrid approach is not clear from a plain reading of the publication. Some of the prominent questions include: (1) The authors make mention of SuperDecisions and present a figure illustrating a decision problem structure using this software but then proceed to inform readers that all modeling and calculations have actually been performed in Microsoft Excel. (2) The publication reports results of a decision that, in one instance is claimed to have interdependent criteria, but the paper seems to contradict itself in laying out its decision problem structure by explaining that the pairwise comparisons created in Microsoft Excel are considered independent. (3) It is not clear from plain reading of the paper how Microsoft Excel was used to account for the interdependencies (*e.g.,* the authors did not mention the use or the construction of an ANP *supermatrix* to account for these interdependencies and even though global priorities were presented in a synthesized model); and, with further clarification regarding the last, (4), the authors presented two sets of values representing the criteria weights that had been calculated, one that considered interdependence and one that did not, but it was not apparent how these two sets of criteria weights were calculated.

Table 18 (Cont'd). Literature Review.

***Title* | (Publication Date)**	**Authors**	**MCDM Methods**	***Relevance to Dissertation* | Comments**
Decision Support for CERCLA Investigations: An Introduction to Decision Analysis Applications | (1994)	Parucker, S. T., Lyon, B. F., Stewart, R. N., and Nanstad, L. D.	[Quasi] MAUT & EPA-Developed Methods	***Relevance:** This publication, which references other work by notable RDM theorists like R. L. Keeney, draws parallels between the decision-making logic that EPA employs in its Remedial Investigation & Feasibility Study process and general decision theory. One of the most relevant features of this publications with respect to this dissertation is the focus on formal decision-making processes used for environmental remediation sites.* | **Comments:** This publication does not emphasize MAUT but lays out a decision-making processes that is very similar to MAUT; one that encompasses setting of goals, identification of alternatives and attributes, followed by weighting and ranking of those attributes and alternatives.

CHAPTER 3

METHODOLOGY AND METHOD

3.1. Introduction

CHAPTER 1 laid out the problem statement, gap assessment, and rationale for the case study approach, among other things. In, the fundamentals of MAUT, AHP, and ANP were discussed. It should be evident from the discussion in , that an evaluation of ANP could not take place without first modeling a decision problem into AHP format. As illustrated by Figure 9 and Figure 10, performing an MCDA on any particular decision problem using these methods requires structuring the various components and parameters of the decision problem into particular formats.

On the heels of the discussion presented thus far, this chapter will present the fundamentals of the MCDM software programs chosen to execute the decision problem and will also present the decision problem in terms of an MCDM-programmable input. The results of the comparisons are analyzed in CHAPTER 4.

3.2. Research Methodology

Noting that the topic and problem statement of this research is multi-faceted, to the extent possible, a traditional quantitative, hypothetico-deductive research paradigm has been followed. Borrowing from the summary provided by Baltimore County Public Schools [BCPS] (2017), the basic methodology for the quantitative research design used in this dissertation follows the following general steps:

1. Make observations about the object of study and investigate the current theory surrounding the problem;
2. Develop one or more hypotheses to explain such observations;

3. Make predictions on the outcomes of the hypotheses;
4. Collect and process the necessary data to support or reject the hypotheses; and
5. Verify the findings, draw conclusions based on those findings, and report and record those findings and conclusions in an appropriate format.

In terms of a quantitative design, the overarching paradigm of this dissertation seeks to determine the extent of the relationship(s) between two or more variables using statistical analyses. As explained by BCPS (2017), this type of research seeks to find relationships between and among the facts of the situation of interest but does not go so far as to intuit, speculate, or prove the causes for those relationships. This paradigm is very fitting for this dissertation and in a way, succinctly explains the thought process behind this dissertation's attempt to address the problem statement. Table 20 presents a high-level layout of the quantitative elements of this dissertation.

Table 20. Justification for Chosen Research Methodology.

Quantitative Design Element	**Relevance / Relationship [to this Dissertation]**
Make observations about a situation, then investigate the theories surrounding the problem.	The observations are captured in the problem statements, which are defined in CHAPTER 1.
Develop one or more hypotheses to explain the problem.	The hypotheses are capture in the *null* hypotheses, which are defined in CHAPTER 1.
Make predictions on the outcomes of the hypotheses.	By virtue of stating the hypotheses in their *null* forms, the predictions are intuitive; that is, it is expected that the null hypotheses will be rejected.

Table 19 (Cont'd). Justification for Chosen Research Methodology.

Quantitative Design Element	Relevance / Relationship [to this Dissertation]
Collect and process data to support or reject the hypotheses.	The literature review, as well as all the information relevant to the case study satisfies the requirement to collect the data; processing the data is satisfied by the development of a model that can adequately address the problem statement. CHAPTER 3 (this chapter) satisfies this element.
Verify findings, draw conclusions, and present research in an appropriate format.	The findings of the research are presented in CHAPTER 4, a discussion on the findings and conclusions are provided in CHAPTER 5. This doctoral dissertation seems to be an appropriate format to present the research.

Leedy and Ormrod (2013) categorizes traditional case study approaches as a qualitative research paradigm.[68] Noting that the purpose of idiographic studies (*i.e.,* case studies) is to gather information about a poorly understood situation, with the intent to form a generalizable theory. This, however, can be a weakness if only one case is examined or observed. For this type of research, data is collected, organized, categorized, interpreted, and then synthesized (Leedy & Ormrod, 2013). The research herein would not be defined as a case study in this sense.

3.3. Research Method, Tools, and Approach

Underlain, structured, and bound by the research methodology, the general format for the research method and approach is as follows:

[68] The notion that classical case studies are traditionally categorized as *qualitative* research paradigms should not be construed to mean they lack quantitative analyses. On the contrary, case studies are a prevalent form of research in medicine, engineering, science, and psychology and often rely on a heavy use of statistics to address their respective problem statements, analyses, and validation techniques. Case studies are considered qualitative because at a fundamental and philosophical level, the purpose of qualitative research is to study one or more situations and then, after careful analysis and interpretation, *speculate* (academics use the word *theorize*) how the information gleaned from those observed situations might be applied to other, similar situations. This is contrary to quantitative research, which focuses on an object of study as-is, in isolation, with the intent and purpose of gleaning everything possible about that specific phenomenon (Leedy & Ormrod, 2013).

1. **Develop Understanding of RDM / MCDM:** Research, obtain, and collect relevant information concerning RDM, MCDM, MAUT, AHP, and ANP necessary and to the extent practical to model an MCDM problem.
2. **Identify a Case Study:** Select a *specimen* to be analyzed that fits the nature of the problem statement. The specimen is used as a proxy for the case study—a substrate of sorts—upon which the MCDM models and combinational hybrid approaches can be comparatively analyzed.
3. **Observe the Specimen:** Study the specimen in terms of the overall objective of attempting to find a geographically appropriate location indicative of the relative natural background value for radon in air:
    a. Research, obtain, and collect necessary information concerning the specimen from publicly available documents;
    b. Break down the information into raw data suitable for inclusion into the MCDM models; and
    c. Tabularize this data when practical.
4. **Model and Analyze the Decision Problem via MAUT, AHP, and ANP:** Using the data collected and information learned in Steps 1 through 3 above, perform the following:
    a. Individually, independently, and separately, for each mode (MAUT, AHP, and ANP), arrange the decision problem into its respective, proper, and basic format;

b. Set up and input the decision problem parameters into the appropriate DSS (in the case of this dissertation, the DSSs are Microsoft Excel and Super Decisions); and

c. Execute the decision problem for each mode.

5. Test the Validation Approach (*see* Figure 4):

a. Draw a simple diagram to illustrate the overall decision-making process.

b. Determine whether or not the MAUT, AHP, and ANP results completed in Step 4 above agree (*i.e.,* determine whether or not the MCDM models point to the selection of the same alternative).

c. If the models agree, compare and contrast the priorities and priority vector (PV) weights associated with the AHP model to the utility rankings and weights associated with the MAUT model. Record qualifying statements relating to the data and results supporting the agreement of the models.

d. If the models disagree:

   i. Check the priorities, CRs, and PVs associated with the AHP model, and adjust if discrepancies are identified.

   ii. Check the utility values and weighting factors associated with MAUT model and adjust if discrepancies are identified.

   iii. Re-run the models and check for agreement in the results.

   iv. If agreement is achieved, compare and contrast the priorities and PVs associated with the AHP model to the utility rankings and weights associated with the MAUT model. Record qualifying statements relating to the data and results supporting the agreement of the models.

v. If agreement is still not achieved, examine the ANP modeled results to identify and better understand network dependencies.

vi. Re-examine the MAUT model while keeping the dependencies identified in the ANP model at the forefront of the mind and check the following:

1. The method used to assign or determine utility values; the purpose of this step is to reaffirm the logic that underpins the determination of the utility values and to make adjustments if necessary.
2. The actual utility scores assigned or calculated; the purpose of this step is to:
    a. Ensure there are no calculation errors;
    b. Ensure the utility scores are in fact aligned with the logic that underpins them (*i.e.,* to ensure that the highest utility values are in fact associated with the most desirable data and the lowest utility values are in fact associated with the least desirable data); and
    c. To make corrections if necessary.
3. Check to ensure that the normalization constraint for the weighting values has not been violated (*i.e.,* ensure the sum of all the weights equal 1).

4. Check to ensure the original weighting values and ensure they still make sense in light of the dependencies noted in the ANP model; using the sensitivity analysis originally performed for the MAUT model as a guide, make adjustments to the weighting values.
5. Re-run the MAUT model and compare the results to the AHP model; if agreement is achieved, compare and contrast the priorities and PVs associated with the AHP model to the utility rankings and weights associated with the MAUT model. Record qualifying statements relating to the data and results supporting the agreement of the models.
6. If agreement is still not achieved, continue adjusting the weighting values associated with the MAUT until agreement with the AHP model is *forced*. Once agreement has been reached, compare and contrast the priorities and PVs associated with the AHP model to the utility rankings and weights associated with the MAUT model. Record the steps taken to achieve forced agreement and be certain to record qualifying statements relating to the data and results, noting key differences in each decision-making process.[69]

[69] With a forced agreement, there is likely a fundamental issue with the manner in which the decision-making process has been conducted between the different MCDM approaches. This could be due to any number of things (*e.g.,* differences in professional judgment, especially if more than one decision-maker is or was involved in the process; a misunderstanding or misclassification of the decision attributes, inconsistent wording of the problem statement itself between the two models; and inconsistent application of process used to evaluate and rate the decision criteria, etc.).

6. Test the Iterative Approach (*see* Figure 4):

The Iterative Approach is intended to serve as a streamlined hybrid between MAUT and AHP, making use of ANP to identify dependencies. For this hybrid, utility values determined during the MAUT process are used as inputs to AHP pairwise comparisons, which in turn, are used to derive PVs. This has the potential advantage of [greatly] reducing the amount of time it would normally take to determine preference values for AHP pairwise comparisons using the traditional Saaty Scale. However, instead of conducting independent evaluations as was done in the Validation Approach, the Iterative Approach should be viewed as one continuous decision-making process.

In so far as this dissertation is concerned, each of the three hybrid approaches are done independently of one another. As detailed in Step 4 above, the decision problem is to be analyzed via MAUT, AHP, and ANP. These serve as the base case; some aspect of at least one of these base case models serve as inputs to each of the hybrids—but the hybrids themselves are considered and evaluated independently. To be clear, this means that no knowledge or data gleaned from one hybrid approach can be used to influence any other hybrid approach, unless such knowledge or data could reasonably be obtained by an independent decision-maker.

The Iterative Approach begins with a completed MAUT, then proceeds to a modified AHP process, and ends with an ANP analysis. This would comprise an iteration, and the process would then repeat itself as necessary to achieve agreement. Certain

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Upon comparing and reviewing the modeled results of the MAUT and AHP techniques after achieving forced agreement, a judgment needs to be made by the decision-maker(s) as to whether the MCDM process should start over from scratch, or if a logical explanation for the discrepant particulars that compelled the forced agreement can be comfortably accepted.

parameters used in the MAUT (*i.e.,* the utility and weighting values) are used as inputs into an AHP-style[70] pairwise comparison. The decision problem is then analyzed via ANP to examine dependent relationships. If there is disagreement between the MAUT and the synthesized [AHP-style] model, then guidance can be sought from both the global priorities calculated from the synthesized [AHP-style] model and from the dependent relationships of the ANP-style analysis. The focus then returns to the MAUT, where the MAUT weighting values can either be re-assessed in light of values calculated for the global priorities of the AHP- / ANP-style analyses, or the entire MAUT structure itself can be reconfigured into more manageable chunks. The process outline for the Iterative Approach is given as follows:

a. Draw a simple diagram to illustrate the overall decision-making process.
b. Use the utility scores and weighting factors generated during the initial MAUT process as inputs into AHP-style pairwise comparisons.
c. Finish the AHP-style process by using the newly derived PVs and creating a synthesized model that calculates global priority scores.
d. Using the AHP-style model as guidance, model the decision problem using SuperDecisions.
e. If the outcome of the AHP-style and/or the ANP-style model is different than the MAUT model, then perform the following:

[70] The terms *AHP-style* and *ANP-style* are used to indicate a departure from the traditional AHP and ANP paradigms posited by Thomas Saaty. While there are many familiar features to Saaty's AHP / ANP, the pairwise comparisons, model synthesis, and even the structure of the processes themselves used in the Iterative Approach are different. It would be difficult for the structure not to be different, since at the heart of the Iterative Approach, a melding between two different MCDMs is established. For instance, identifying alternatives is one of the first things done in MAUT, but one of the last things evaluated in AHP.

i. Re-examine the MAUT model while keeping the dependencies identified in the ANP model at the forefront of the mind and check the following:

   1. The method used to assign or determine utility values; the purpose of this step is to reaffirm the logic that underpins the determination of the utility values and to make adjustments if necessary.
   2. The actual utility scores assigned or calculated; the purpose of this step is to:
      a. Ensure there are no calculation errors;
      b. Ensure the utility scores are in fact aligned with the logic that underpins them (*i.e.,* to ensure that the highest utility values are in fact associated with the most desirable data and the lowest utility values are in fact associated with the least desirable data); and
      c. Make corrections if necessary.
   3. Check to ensure that the normalization constraint for the weighting values has not been violated (*i.e.,* ensure the sum of all the weights equal 1).
   4. Check the original weighting values, and ensure they still make sense in light of the dependencies noted in the ANP model; using the sensitivity analysis originally performed for the MAUT

model as a guide, make adjustments to the weighting values, if necessary.

ii. Re-evaluate the MAUT weighting factors using the global priorities calculated from the AHP-style synthesized model, and determine if the models agree. If the models agree, record qualifying statements relating to the data and results supporting the agreement of the models

iii. If the models still do not agree after reprograming the MAUT with the global priorities from the AHP-style synthesized model, then use the ANP results to break down the MAUT attributes into more granular components, and re-run the MAUT model again.

1. At this point, a new set of AHP-style pairwise comparisons and a new AHP-style synthesized model will have to be generated, followed by a new assessment via ANP.

2. Check for agreement between the models. If agreement is reached, record qualifying statements relating to the data and results supporting the agreement of the models.

iv. If agreement is still not reached, repeat Steps 6.e.ii. and 6.e.iii. above.

f. Agreement should be reached within one or two iterations. If agreement cannot be achieved after several iterations, record qualifying statements relating to the data and results in an attempt to document the apparent failure of the model, and then undertake a fundamental evaluation of the problem statement.

7. Test the ANP-Weighting Approach (*see* Figure 4):

a. Draw a simple diagram to illustrate the overall decision-making process.

b. Analyze the decision problem via ANP.

c. Use the results of the ANP model (*i.e.,* the global priority values) to inform the weights assigned to the MAUT model.

    i. Since the ANP DSS (*i.e.,* SuperDecisions) reports priorities holistically in terms of every element in every cluster, it may be necessary to weight the global priorities to be consistent with a MAUT-structured decision problem format.

    ii. The ANP global priorities (re-arranged to inform MAUT weighting factors) should be normalized to equal 1 in accordance with the normalization constraint.

d. Re-run the initial MAUT analysis using the new weights as discussed above; the criteria weights should be multiplied by their respective utility values. The alternative weights should be multiplied by the summed and weighted utility values to produce a new global aggregated utility score.

e. Report the results.

8. Analyze the Results: Compare and contrast the results of all the MAUT, AHP, and ANP analyses, especially noting:

a. Normalization of the attribute factors (of MAUT) to the relationship values (of ANP) via proportionate scaling.

b. Statistical differences between weighting factors.

9. Interpret the Results: Explain the results in terms of the problem statement, identifying strengths, weaknesses, and opportunities.

10. Address the null hypotheses.

11. **Generalize the Results:** Elaborate on potential future research opportunities identified.

12. **Conclude the Research:** Offer conclusions on the research and value added.

As discussed in CHAPTER 1, a decision tool has been created using Microsoft Excel to act as a DSS and facilitate the modeling efforts; Super Decisions (version 2.8) was used to analyze the decision problem via ANP. For purposes of this dissertation, comparison of MAUT and ANP is simple enough to avoid necessitating the use of more sophisticated software, and yet the underlying purpose of the research is not believed to be compromised by virtue of *not* using more sophisticated DSSs. Additionally, by using a common template for both the MAUT and ANP analyses, it is easier to format and work with the results for further comparative analyses.

The paradigm for this research is highly quantitative, not qualitative. The problem statement beckons a quantitative comparative analysis between MAUT and ANP. However, it is by virtue of observing the problem statement through the lens of a specimen that the research is given a real-world basis; *i.e.,* a way to point to the practical nature of the new knowledge to be generated. As will be discussed in CHAPTER 5, issues surrounding "background values," are not limited to radon. Just in the environmental management field alone, there are in fact a number of controversies that are purportedly spawned by a lack of pre-anthropogenic data. These issues are especially manifest in groundwater contaminants, climate change, and even the causes for genetic mutations.

3.4. The Specimen

3.4.1. Purpose, Intent, and Limitations

As explained in the problem statement, which was intentionally placed conspicuously upfront in CHAPTER 1, the objective of this dissertation is to compare MAUT and ANP, and determine the prospects of a new hybridized MAUT-ANP decision-making technique. In an attempt to provide an indication as to the practical applicability of any such new MCDM approach, a simulated situation based on real data for a real site (*i.e.,* the specimen) is deemed necessary.

Even though it is based on real data and pertains to real events and real places, the descriptions and pertinent attributes of the specimen (as presented herein) are deliberately established as **limited** abstractions—an abridgment—of what would otherwise be an extremely complicated plethora of decision attributes and circumstantial considerations. In the case of the specimen site discussed in this dissertation, such an in-depth and fully detailed MCDM application could conceivably take the efforts of a dozen scientists, engineers, and engineering managers more than a year to properly conduct.

In fact, it is completely reasonable to assume that the complexity, depth, breadth, and quantity of the data and information to be reviewed and evaluated would be equally as research-intensive for any real-life engineering management problem of similar caliber. In the particular case of the specimen discussed herein, and as of the date of publication of this dissertation, there are more than 60 years' worth of relevant history that would need to be reviewed to inform a true and complete MCDM model.

If the MAUT-ANP approaches presented in this dissertation were accepted and recognized MCDM techniques, they could then conceivably be applied, in earnest, to any unabridged, fully comprehensive, real-life decision. In sum: to satisfy the needs of this dissertation, the specimen is merely a *modeled* decision problem, albeit one with roots in real-life but one whose sole purpose is to be used as a proxy to test the MAUT-ANP approach set forth by this research.

3.4.2. Relevant History and Context

Yellowcake (a type of uranium oxide, primarily of the general chemical formula U_3O_8) is the long-standing first step in the uranium enrichment process. Except in the strictest of laboratory settings, yellowcake is not purely U_3O_8; it contains radium, thorium, polonium, and lead (Armstrong, Pomerantz, & Donev, 2017). At the behest of the US government during the Cold War, Homestake Mining Company of California (here after simply referred to as the *Contractor*), operated a milling operation in the southwestern US. The Contractor processed natural uranium ore to produce U_3O_8. In its natural state, the U_3O_8 contains uranium (>99% ^{238}U relative abundance), in addition to ^{226}Ra, ^{234}Th, ^{210}Po, and ^{210}Pb. Several other similar such *contractors* were also contracted with the federal government to produce U_3O_8 to support various classified Cold War efforts for the Department of Defense and the Department of Energy (Homestake Mining Company [HMC], Arcadis, & Hydro-Engineering, 2012; HMC & Hydro-Engineering, 2010; Kuhn & Jenkins, 1986) .

At the height of its operations, the Contractor's primary base of milling and processing operations was proximal to a handful of small communities with a combined population of approximately 20,000 residents. During the Cold War, the work the Contractor was engaged in, along with the other contractors who were engaged in similar work, fueled a booming economy in the area. From 1958 until 1990, the Contractor processed more than 30 million tons of uranium ore and produced several tons of U_3O_8. Throughout the course of these efforts, mill tailings (the residual by-product material that remains after processing mined ore), was placed into one of two unlined tailings impoundments (EPA, 2018; Kuhn & Jenkins, 1986). In all, more than 22 million tons of mill tailings (*i.e.,* radioactive by-product material) were generated (EPA, 2018; HMC, Arcadis, & Hydro-Engineering, 2012).

Over the course of the facility's 32-year operation, tailings material leached into the underlying hydrogeologic formations and created large contaminant plumes stretching out for several square miles (EPA, 2016; HMC & Hydro-Engineering, 2010; Kaufmann, Eadie, & Russell, 1976). Groundwater and soil testing began in the late 1960s after several citizens started expressing environmental concerns. Testing results revealed elevated concentrations of radium, thorium, and uranium in various groundwater wells within reasonable proximity to the Contractor's site. The elevated concentrations of these Constituents of Concern (COCs) were found up to three miles away and tended to generally follow the flow and direction of groundwater movement and topography (HMC, Arcadis, & Hydro-Engineering, 2012; HMC & Hydro-Engineering, 2010; Kuhn & Jenkins, 1986). Over time, environmental regulators ordered enforcement actions and eventually designated the facility as a Superfund remediation site in 1983 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (EPA, 2018). The Contractor has been involved in remedial actions at the site since 1976 (EPA, 2018; HMC, Arcadis, & Hydro-Engineering, 2012).[71]

[71] Every year, the Contractor publishes an "Annual Monitoring Report / Performance Review." This annual report is typically submitted to NRC, EPA, various other state and federal regulatory agencies and made available to the public as well. In these annals, the Contractor provides a progress report on various parameters associated with the groundwater remediation efforts at the site. These reports are available via request to NRC and in many instances, are readily accessible on NRC's Agencywide Documents Access and Management System (ADAMS) via the internet at https://www.nrc.gov/reading-rm/adams.html.

3.4.3. High Level Description of the Specimen's Physical, Hydrogeological, Hydraulic, and Aeolic Characteristics

3.4.3.1. General Topography

The Contactor's site is located near the lowest lying portion of the semi-circular San Mateo Basin in Cibola County, New Mexico. The Zuni Mountains exist to the southwest of the Contractor's site while a large volcanic mountain, Mount Taylor, rests to the east of the site. Other large plateaus and mesas surround the site nearly 360 degrees and varying in elevation from approximately 7,000 to 8,600 ft. MSL. There are several natural drainages that generally flow toward the Contractor's site from higher elevations. The bottom of the San Mateo Basin itself is generally flat and unremarkable (Gordon, Reeder, & Kunkler, 1961).

3.4.3.2. Prominent Geology

The entire San Mateo Basin is heavily mineralized, with the area once having been crowned "The Uranium Capital of the World." Significant natural deposits of uranium, radium, thorium, and selenium are prevalent (Gordon, Reeder, & Kunkler, 1961). The Contractor's site rests atop the San Mateo alluvium, which is approximately 120 feet thick in most places (HMC & Hydro-Engineering, 2010). Underlying the alluvium is the Chinle Formation (with Upper and Lower members); the Chinle Formation is mainly comprised of shale and siltstone and has three distinct strata associated with it (the Upper, Middle, and Lower Chinle Formations). The Chinle Formation is underlain by a large, regional formation called the San Andres Limestone Formation (EPA, 2016, p. D-1; HMC & Hydro-Engineering, 2010).

It is important to account for geological differences when attempting to determine a geographically appropriate location indicative of the relative natural background value for radon. Referring to Figure 19 below, which represents an artistic rendition of the specimen site, it is assumed that underlying geology of all sampling points is generally consistent. This assumption is supported by the work of numerous studies of the San Mateo Basin over the past 60 years.

3.4.3.3. Prevalent Meteorological / Aeolic Conditions

The Contractor's site is located in a predominantly arid to semi-arid continental climate. Precipitation at the site is generally from rainfall in late summer, although snowfall during the winter months is not uncommon (ERG, 2013). Average annual rainfall is approximately 10.5 inches (US Climate Data, 2018). Figure 15 illustrates the major drainage features and data collection points associated with the Contractor's site.

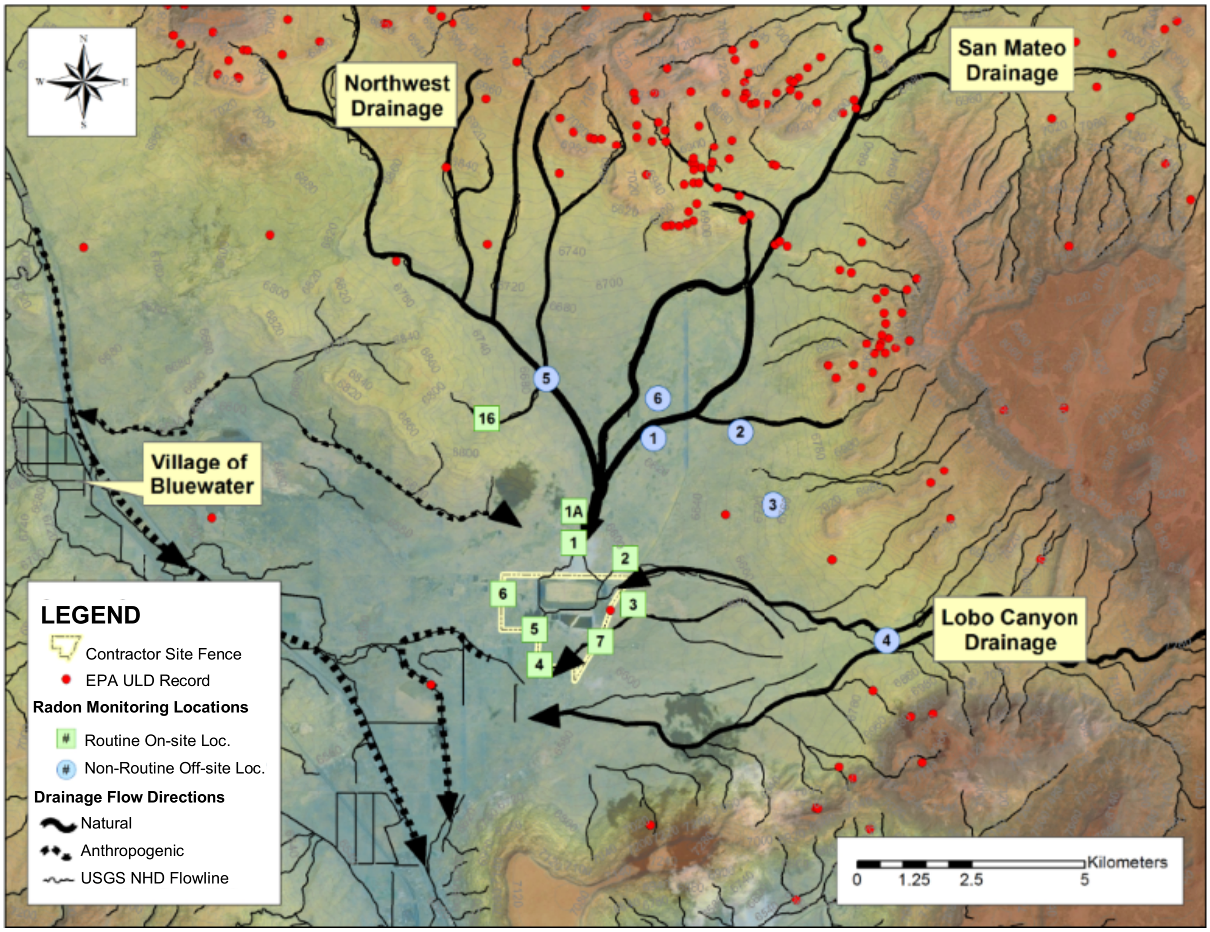

Figure 15. Specimen: Location of Major Drainage Features, Data Points, and Marked Locations of Known Anthropogenic Sources of Radon.[72]

As illustrated on Figure 15, the central focus is the contour of the Contractor's fence line. Surrounding the Contractor's site, are several routine radon monitoring locations (as indicated by the numbered green squares) and non-routine radon monitoring locations (as indicated by the numbered blue circles). (The numbered blue circles are referred to as *off-site* locations, and often spoken of as the designated number followed by the word "off," *e.g.,* "1 – Off.") The black arrows

[72] Illustration by Mr. Chuck Farr at Environmental Restoration Group, LLC, Albuquerque, New Mexico © 2013. Illustration shown in Figure 15 has been modified from the original publication in ERG (2013). Graphic used and modified with permission.

illustrate not only the natural water drainage channels associated with the site but also the natural elevation slope and direction, and thus, the natural flow path that heavier-than-air gases (like radon) would tend to follow.

3.4.3.4. Wind Rose Parameters

As presented in Table 2, wind rose parameters are important to understand the movement and accumulation of radon. For the purposes of this dissertation, data for wind speed and direction are illustrated in

Figure ***16*** below.[73]

[73] Wind rose data covering the years 2009 – 2011 is reflected in
Figure ***16***; this is assumed to be sufficient for the needs of this dissertation. Data has been excerpted HMC, Arcadis, and Hydro-Engineering (2012).

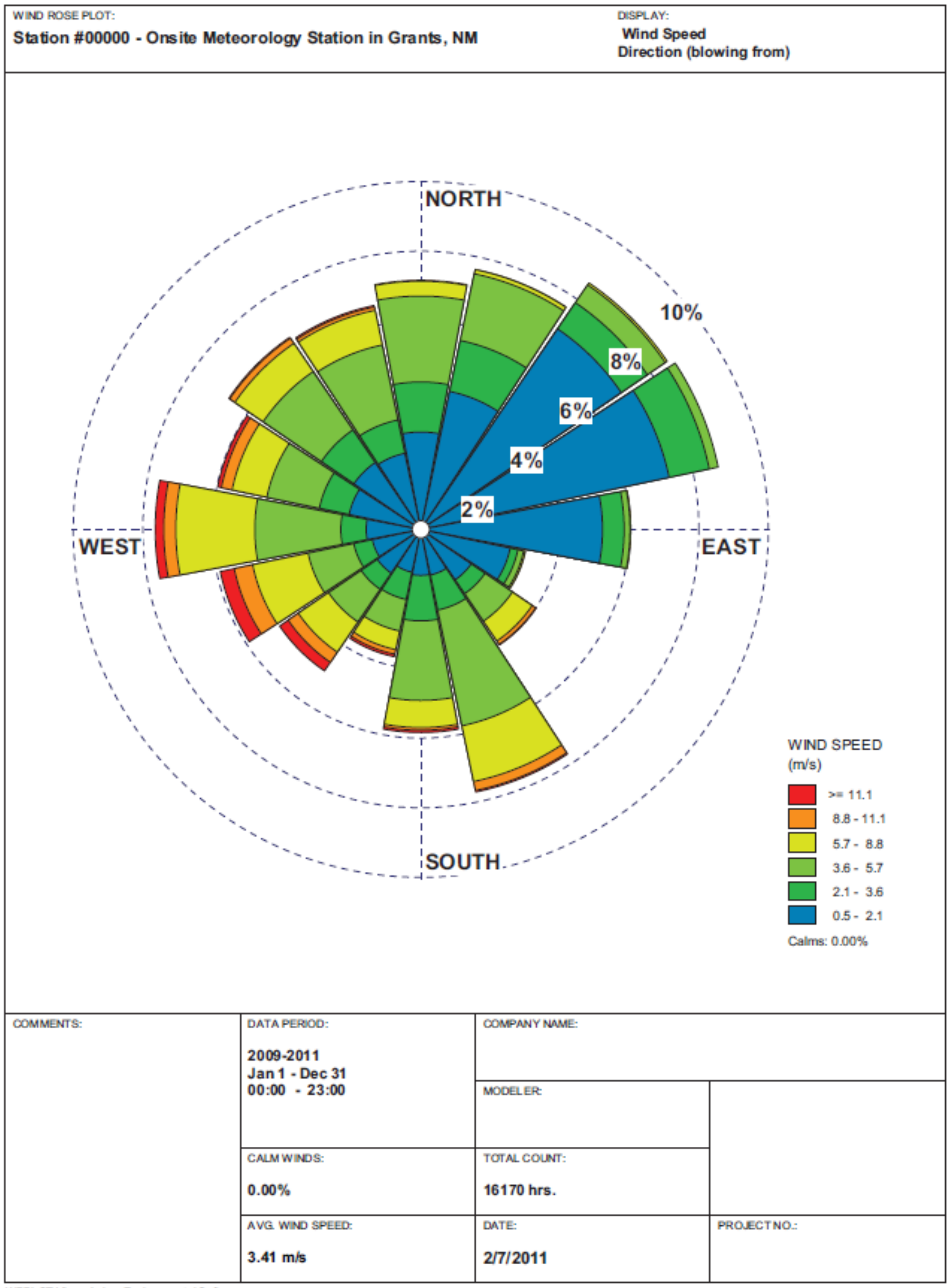

Figure 16. Specimen: Wind Rose Parameters as Measured, 2009 – 2011.[74]

[74] Graphic courtesy of Lakes Environmental Software: Print-out of queried report of Contractor's on-site meteorological monitoring station; published in HMC, Arcadis, and Hydro-Engineering (2012).

Under a more robust and in-depth examination, temperature and precipitation would normally be key factors to model when considering radon measurements. However, for the needs of this dissertation, temperature and precipitation are excluded as decision criteria for the following reasons. First, the only temperature and precipitation data publicly available are shown in Figures

Figure ***17*** and Figure ***18***, respectively. Second, since the temperatures and precipitation values represented are regional, the same temperature and precipitation values would be applied to all decision alternatives. The situation would be different if each location shown in Figure 15 had an associated temperature and precipitation measurement to go along with it that corresponded to the same time period that the radon measurements were taken.[75]

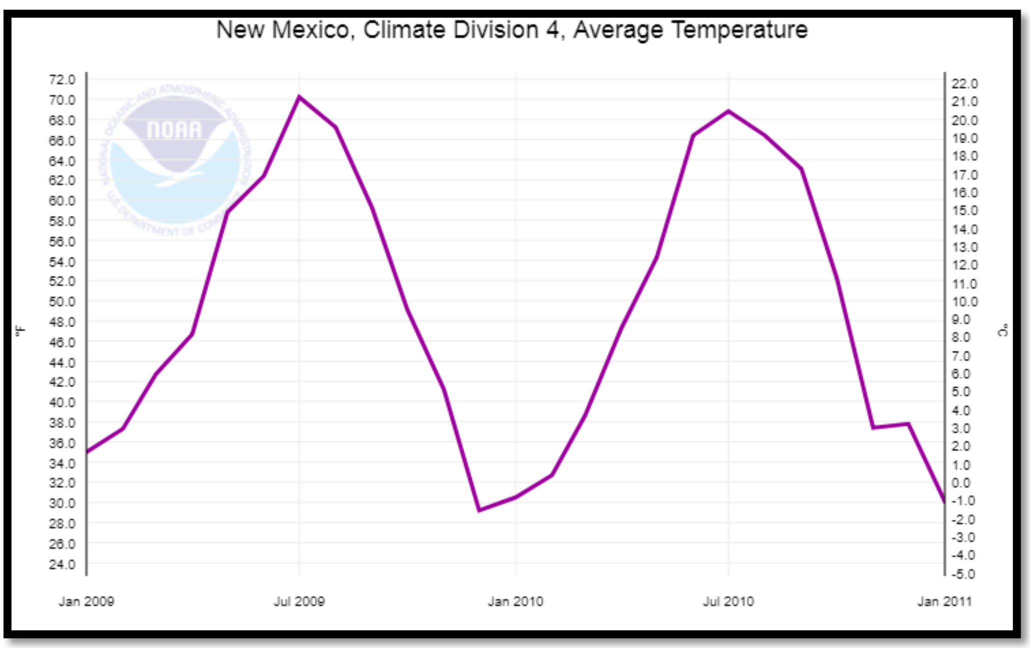

Figure 17. Average Temperature for Climate Division 4 (Southwest Mountain Region) of New Mexico, 2009 – 2011. [76]

[75] The absence / exclusion of this data in the MAUT, AHP, and ANP analyses is deemed acceptable for the needs of this dissertation.

[76] Graphic courtesy of NOAA's National Centers for Environmental Information. *See* NOAA (2018).

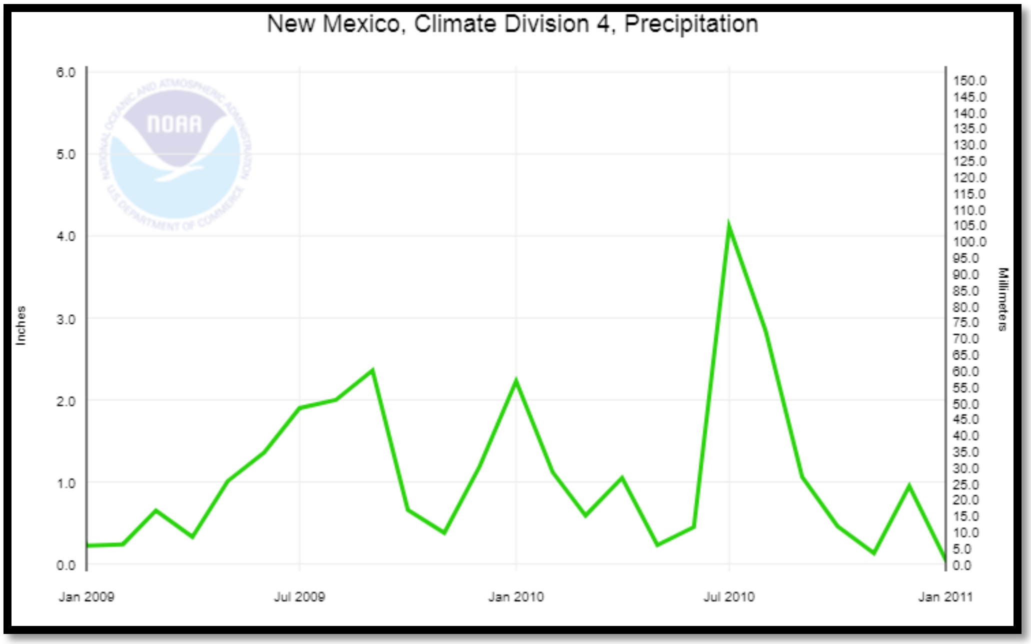

Figure 18. Average Precipitation for Climate Division 4 (Southwestern Mountain Region) of New Mexico, 2009 – 2011.[77]

3.4.3.5. Surface Water Flow

Surface drainage across the Site is generally directed to the southwest. The Contractor's site lies partially within the floodplain of San Mateo Creek, which is part of the Rio Grande drainage basin. The confluence of the San Mateo Creek and Arroyo Del Puerto is about 10 miles north of the Contractor's site. Snowmelt run-off during late spring and heavy summer and fall rainfall events, tend to cause flood waters to pass through the Contractor's site and continue to the nearby communities (EPA, 2016; HMC & Hydro-Engineering, 2010).

[77] Graphic courtesy of NOAA's National Centers for Environmental Information. (*See* NOAA, 2018).

3.4.3.6. Groundwater

Groundwater flow in the vicinity of the Contractor's site is a very complicated issue due to stratification of the underlying hydrogeologic formations, the details of which are far beyond the needs of this dissertation. Suffice it to say:

- With only a few exceptions, the general flow of groundwater in the alluvial and Chinle aquifers is from the northeast to the southwest while the general flow of groundwater in the San Andres-Glorietta aquifer is from west to east; and
- The Contractor's past site activities have contaminated the alluvial aquifer, with the underlying Chinle aquifers having been contaminated via hydraulic communication between the two formations (Gordon, Reeder, & Kunkler, 1961; HMC & Hydro-Engineering, 2010; Kaufmann, Eadie, & Russell, 1976). The San Andres-Glorietta aquifer has not been impacted by the Contractor's activities (HMC & Hydro-Engineering, 2010).

It may be intuitive to think that the natural process of *evapotranspiration* and the tendency of [radon] gas to exhale from water would dictate that groundwater containing uranium, thorium, and radium (and radon itself) would be a key decision attribute for practical applications involving geographic locations indicative of the relative natural background value for radon in air. While in some instances this would certainly be true, in order for groundwater characterized with such water quality to be a contributing factor to the presence of airborne radon, the depth-to-groundwater (as measured from the surface of the ground) would need to be very shallow, and the concentrations of radon and radon parent isotopes in the groundwater would need to be significantly elevated. A commonly used rule of thumb is that for every 10,000 pCi/L of radon in water, only 1 pCi/L of radon in air will result (National Academy of Sciences [NAS], 2009; Hoffman, 1995).

In the absence of site-specific data, the work of Girault, Perrier, and Przylibski (2016) can be used to approximate the ratio of ^{226}Ra to ^{222}Rn in groundwater (noting that ^{226}Ra is the immediate precursor to ^{222}Rn, with $\lambda_{Ra\text{-}226}$ = 16,000 years); at a ratio of 0.0037:1, it should be apparent that even if secular equilibrium were established, several thousands of picocuries of ^{226}Ra would need to be present to generate only a few picocuries of ^{222}Rn (in water), which would in turn, lead to even less ^{222}Rn in air.

As the issue of "vent piping" has often been discussed in many environmental studies and toxicological risk assessments, based on HMC and Hydro-Engineering (2013), the location of selected alluvial groundwater monitoring wells with respect to established radon monitoring locations is illustrated in Figure 19 below. The ^{226}Ra concentration is known for some of these wells. Table 21 provides the designation, location, elevation, measured ^{226}Ra concentration, and the calculated ^{222}Rn concentration. As can be seen, the ^{222}Rn concentration in air attributable to the ^{226}Ra concentration in the groundwater associated with these wells is insignificant, and in most cases, would be beyond measurement with current technology.

Table 21. Specimen: Insignificance of ^{222}Rn Attributable to ^{226}Ra Concentrations in Groundwater Wells.[78]

Loc. ID	Latitude °N	Longitude °E	Elevation (ft. MSL)	Measured $^{226}Ra_{gw}$ (pCi/L)	Calculated $^{222}Rn_{air}$ (pCi/L)
A	35.24004	-107.88614	6570	No Data	N/A
B	35.25206	-107.87099	6593	0.09	0.0001
C	35.25329	-107.86996	6593	0.36	0.0006
D	35.24978	-107.86482	6590	0.18	0.0002
E	35.25674	-107.86024	6594	0.35	0.0005
F	35.26136	-107.85233	6604	0.29	0.0004
G	35.24914	-107.85113	6593	Lab Error	N/A
H	35.23426	-107.86111	6572	Lab Error	N/A
I	35.22901	-107.86428	6568	No Data	N/A
J	35.22958	-107.86909	6563	No Data	N/A
K	35.23400	-107.87127	6566	No Data	N/A
L	35.27517	-107.84803	6624	0.79	0.0012
M	35.27627	-107.84434	6623	No Data	N/A
N	35.27545	-107.83111	6642	No Data	N/A

Thus, even though the Contractor has more than 2,000 cased water wells scattered across the vicinity, and even though such borings could act as airflow channels, neither groundwater in its host hydrogeologic setting nor these numerous water wells are considered significant sources of airborne radon. This conclusion is supported by work of EPA (2016), among others. Accordingly, these groundwater radiochemistry factors are excluded as decision attributes from the MAUT-ANP decision models in this dissertation.

[78] Radium and elevation data presented in Table 21 have been excerpted from HMC and Hydro-Engineering (2013); HMC and Hydro-Engineering (2013) should be consulted for specific details pertaining to the manner and method in which data was gathered, calculated, the instruments used, and other related matters. Geographic coordinates presented in Table 21 were obtained using the interactive geographic database provided by Nathansen (2018) and converting the northing and easting coordinates given in HMC and Hydro-Engineering (2013). These values are assumed to be sufficient for the needs of this dissertation.

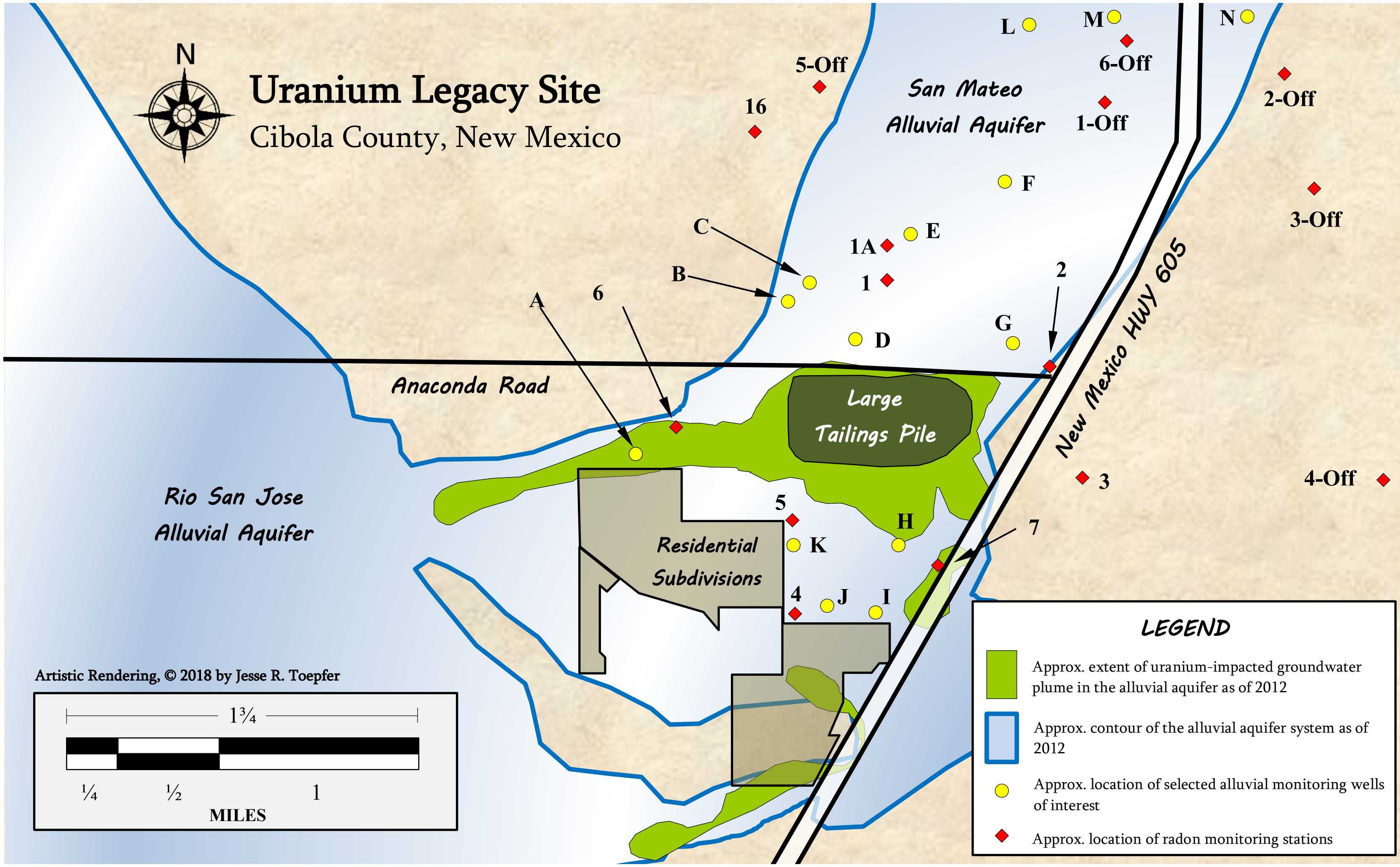

Figure 19. Specimen: Artistic Rendering of Uranium-Impacted Alluvial Groundwater Plumes and Other Selected Features in the Vicinity of the Contractor's Site as of 2012.

3.4.4. Important Rates Associated with Radon Movement and Transport

There are a number of particular attributes that would be somewhat unique to any case study decision problem involving radon. The natural phenomena discussed in CHAPTER 1 (*see* Table 2) that affect radon concentrations are obviously among these attributes, but for this specific case study, there are a few important pieces of information needed for the MAUT-ANP decision model. These are as follows:

1. As the chief cause for the presence of radon is ultimately due to geological factors, the first piece of information needed is an accounting of the estimated rate at which radon emanates from its host geology; migrates through soil gas, groundwater, and interstitial spaces and transpires from the sub-surface to the atmosphere;[79, 80, 81]
2. The estimated rate at which the Contractor's onsite structures and features release radon into the environment; and
3. Information pertaining to potential sources of bias in the vicinity, including:
    a. The location of known nearby uranium mining features (*e.g.,* mine shafts, vents, portals, adits, *etc.*); and

[79] For the purposes of this dissertation, the process by which radon *emanates*, *migrates,* and *transpires* is collectively referred to as *exhalation*. It is recognized that other sources may use the word *exhalation* differently in similar contexts.

[80] In reality, there would likely be three different rates, or values, for each phase of exhalation. That is to say, one rate for emanation, one rate for migration, and one rate for transpiration, and each of these would be dependent on a multitude to specific, local geochemical and hydrogeological factors. For the purposes of this dissertation, one *cumulative* rate is assumed to be sufficient.

[81] In the absence of any anthropogenic disturbances to the land, a geographically appropriate location for the relative natural background value for radon (in air) could be determined by taking several measurements in the area and selecting the location that lies closest to a preferred measure of central tendency (*i.e.,* the location that lies closes to the mean or median value of all the measurements taken). Clearly, such circumstances do not afford themselves to this case.

b. The distance from known nearby uranium mining features to the Contractor's site and to the respective geographic locations where radon measurements were collected.

3.4.4.1. Estimated Rate of Radon Exhalation

Traversing through fractures, cracks, and pore spaces between grains of soil, radon has much greater mobility than its parent isotopes (*i.e.,* radium, uranium, and thorium), due to its gaseous state at STP. The freedom with which radon can move through these interstitial spaces effects how much radon can reach the surface. The more easily radon can move before undergoing a nuclear transformation (*i.e.,* before radioactively decaying), the more likely it is for higher concentrations of radon to accumulate in the atmosphere (USGS, 1995).

The mode of transport and speed that radon can travel through the interstitial spaces in soil is predominantly controlled by the amount of water present (*i.e.,* the soil moisture content) within those interstitial spaces (Hoffman, 1995; Lindmark & Rosen, 1985; USGS, 1995); soil permeability is the soil's ability to transmit water and air and is determined by the soil's porosity and the degree of communication (*i.e.,* interconnectedness) of the interstitial spaces in the soil (USGS, 1995).

It is intuitive (and correct) to imagine that radon can move more easily through permeable soils such as coarse sand and gravel and less easily through impermeable clayey soils; the average distance that radon can travel prior to decaying is less than one inch in water-saturated rocks or soils, but it can move several tens of feet through dry rocks or soils (USGS, 1995). Schumann, Owen, and Asher-Bolinder (1988) concluded that there is an optimal soil moisture content of between approximately 15 and 20 percent that best allows for the mobility and transport of radon. The reason for this, is that between these levels, thin coatings of moisture on the soil grains are able to absorb some of the α-recoil[82] energy of radon atoms as they emanate from the soil grains and escape; this in turn, helps to reduce the likelihood that the radon atoms will re-enter the soil matrix (which is what tends to happen if moisture content is less than 15 percent). At higher moisture levels, radon tends to get trapped in the pore spaces.

The emanation coefficient is the fraction of radon atoms that escape from a mineral grain into the contiguous pore space. The rate of diffusion of radon into the atmosphere can be determined by the radon gas concentration gradient across the radon gas sources (rocks, soils, and building materials, *etc.*) and the surrounding air; this can provide a measure of the rate of liberation of radon from its geologic origins to the atmosphere (Hassan, Hosoda, Ishikawa, Sorimachi, Sahoo, Tokonami, & Fukushi, 2009).

In their study on radon emissions from soils, Hassan *et al.* (2009) listed the exhalation rate for soils in New Mexico as 32 ± 4.1 millibecquerels[83] per square meter per second (mBq/m^2 s), which equates to 0.8649 ± 0.1108 pCi/m^2 s. While the value listed by Hassan *et al*. (2009) is helpful, it was not clear if the radon exhalation rates given were specifically for the San Mateo Basin, which is a heavily mineralized region of New Mexico and the location of the specimen. That is to say, it is not clear if 0.8649 ± 0.1108 pCi/m^2 s is a statewide average, a local average for a different area of New Mexico, or an accurate representation of the radon exhalation rates in the vicinity of the San Mateo Basin.[84]

[82] When a radioactive nucleus undergoes α-decay (*i.e.,* ejects an α particle from its nucleus), which is the mode of decay that transforms ^{226}Ra into ^{222}Rn, the laws of conservation of energy and momentum dictate that the remainder of the mass (*i.e.,* the newly formed isotope) must recoil in the opposite path of the particle ejected; this is referred to as *α-recoil* (Alpha Particle, 2014).

[83] Named after the French physicist Antoine Henri Becquerel; the becquerel (Bq) is the SI unit for radioactivity. 1 Bq = 2.7×10^{-11} Ci = 27 pCi (Allisy, 1996).

[84] The radon exhalation rate from soil of 0.8649 pCi/m^2 s is assumed to be sufficient for the RDM and MCDM needs of this dissertation.

The importance of this number with respect to the MCDM method at hand is as follows: As indicated by Figures Figure ***15*** and Figure *19*, there are several radon monitoring locations (*i.e.,* data points) surrounding the Contractor's site. Some of these data points lie in undisturbed areas. While the largest source of radon in the vicinity originates from the Contractor's Large Tailings Pile (LTP), and even though wind conditions could blow radon toward some of these data points (even up to a mile or more away), it is also well within reason that a *portion* of the measured radon values observed at these data point locations are due to natural exhalation from the underlying, uranium-and-radium-and-thorium-bearing soil. As was discussed in CHAPTER 1, since no pre-anthropogenic measurements were taken to establish a baseline environmental condition, no one can ever really ascribe an exact quantity for this *portion*, but it is nonetheless an important consideration for making a rational decision. As will be explained later, ascribing the exhalation rate of radon from soil is an attribute common to all alternatives.

3.4.4.2. Estimated Emission Rate of Radon from Contractor's Site

ERG (2013) gives a total ^{222}Rn emission rate of 507.78 Ci/y and includes the emissions from the LTP and all other radon sources at the Contractor's site. The total area of these structures and features is approximately 300 acres, which equates to approximately 1.2 million square meters. Thus, for the purposes of this dissertation, it is assumed that all onsite sources combined generate approximately 13.255 pCi/m^2 s. The dispersion of radon from the Contractor's site is governed by Fick's and Charles' Laws relating to gasses, along with a host of differential equations and the natural phenomena presented in Table 2.

3.4.4.3. Known and Unknown Biasing Factors

As shown on Figure 15, there are more than two hundred *other* anthropogenic radon sources upwind, up-gradient, and adjacent to the Contractor's site. Each of these sites represents a known source of radon that has the potential to influence the measured radon values at geographic alternatives of the decision model. The red dots scattered across Figure 15 represent the numerous legacy uranium mines in the area as derived from the EPA's Uranium Locations Database (ULD); these legacy uranium mines are unaffiliated with the Contractor's site.

It is important to note that these two hundred or so sites only represent the *known* legacy uranium mines in the area; it is believed with the confidence of firsthand experience that there are likely several hundred *additional* uranium mining features scattered across the San Mateo Basin, none of which would be affiliated with the Contractor's site. Measured values of radon emanating from these features is not believed to have ever been collected, let alone in any sort of comprehensive work. Thus, while radon measurements have been collected at the numbered geographic locations identified in Figure 15, when dissecting these measurements, it would be wholly impossible to distinguish the portion of radon is being measured at the Contractor's site from that which is from these hundreds of other sites. It would also be equally impossible to distinguish both of the former from how much is exhaling naturally from the ground.

Still referring back to Figure 15, locations associated with 5-Off, 6-Off, and 4-Off, all of which are located at higher elevations and are each sufficiently located within their respective natural drainage pathways to approximate *point sources* for the up-gradient sources of anthropogenic radon. That is to say, in order to simplify the modeling, since it is known that there are numerous sources of anthropogenic radon surrounding the Contractor's site, and since these sources collectively form a partial circumscription around the Contractor's site stretching more than a hundred miles, and since the terrain is such (as evident by the natural drainage channel flows) that there are essentially three different main flow paths entering the main channel of the San Mateo Valley floor, it can therefore be assumed, that the radon measurements associated with

5-Off, 6-Off, and 4-Off unto themselves, represent anthropogenic sources of radon. Another way to look at it, is to say they are sufficiently biased so as to represent anthropogenic radon from sources not associated with the Contractor's site and also in addition to the Contractor's site. Thus, while the Contractor's LTP certainly represents the largest source of radon in the general vicinity, the notion that the aforementioned offsite locations are receiving undue bias from other anthropogenic sources cannot be dismissed.

What does all this mean? In terms of this dissertation, it is important to explain these parameters for context in an attempt to convey a fuller understanding of the case study. In terms of the specimen, it means that regardless as to whether the question pertains to background values or determining the specific contributions due to a particular PRP, there are confounding variables in the mix that preclude an accurate answer from ever being known with certainty. In terms of the MAUT-ANP MCDM at issue, it means that the rational answer must be based on a limited set of attributes, and the decision-maker(s) must accept the fact that none of the decision alternatives can ever be a true marker for the relative natural background value for radon.

3.4.5. Specimen Information Selected for MCDM Modeling

Noting that there are essentially four attributes of the specimen that have been deemed critical for the evaluation of the MAUT, AHP, ANP, and MAUT-ANP Hybrids. These are: The measured ^{222}Rn concentration, distance from an anthropogenic source, relative elevation, and windward exposure relative to an anthropogenic source. Table 22 below summarizes the attributes of the specimen that have been selected and those that have been excluded.

Table 22. Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Measured ^{222}Rn concentration in air	Actual measured value of radon in air taken at the location of each alternative.	***Included for the following reason(s):*** Key parameter of case study for the dissertation. Geographic alternatives whose measured radon concentrations are equal to the calculated median value are more desirable, with utility/preference diminishing as a function of deviation from the median value. However, as mentioned in CHAPTER 1, since the objective of the dissertation is to find a background *location* and not a *value*, the purpose of including radon measurements as a decision attribute is merely to help ensure there are no localized hydrogeological anomalies that could bias the data points. As such, measured ^{222}Rn concentration is ascribed a low overall importance.
Elevation	Reported elevation of each geographic alternative measured in feet above MSL.	***Included for the following reason(s):*** In the absence of wind movement, radon will follow the natural [water] drainage features of the local topography and accumulate in the lowest lying areas. Geographic alternatives whose reported elevation values are equal to the calculated median value are more desirable, with utility/preference diminishing as a function of deviation from the calculated average.
Distance from Contractor's LTP	Calculated distance to alternative location, as determined from cited SPCS coordinates.	***Included for the following reason(s):*** With respect to the other decision attributes, proximity to the Contractor's LTP can serve as an indication for the degree of bias present in the measured radon value, with more distal alternatives being more desirable.
Distance to nearest source of known bias.	Calculated distance to alternative location, as determined from cited SPCS coordinates.	***Included for the following reason(s):*** With respect to the other decision attributes, proximity to a known EPA ULD location can serve as an indication for the degree of bias present in the measured radon value, with more distal alternatives being more desirable. For the purposes of this dissertation, in addition to the Contractor's site, there are three locations that are considered point sources of up-gradient anthropogenic radon. These are: 5-Off, 6-Off, and 4-Off.

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Wind Speed[85]	The approximate number of hours a particular range of wind speed was observed (as a function of wind direction from a relative position), as measured hourly by the Contractor's onsite meteorological station and illustrated by the wind rose in Figure ***16***.	***Included for the following reason(s):*** Wind is a key natural phenomenon that affects the ability of radon to accumulate. With respect to the other decision attributes and with emphasis on selecting a geographically appropriate location indicative of the ***relative natural*** background value for radon, deference is given to the norms of the area under study.
Wind Exposure	With geospatial reference beginning at an anthropogenic source (*i.e.,* as a starting point), the approximate number of hours within the data period that wind conditions were blowing toward a geographic alternative.	***Included for the following reason(s):*** Wind is a key natural phenomenon that affects the ability of radon to accumulate.
Precipitation	Recorded precipitation values in the region during the data period.	***Excluded for the following reason(s):*** *See* Notes 1 and 3.
Toxicological & Human Health Risk Factors	Values, either calculated or estimated, that are typically considered when ascribing a Lifetime Risk of Cancer (LTRC) to a human population exposed to a contaminant of concern.	***Excluded for the following reason(s):*** *See* Notes 2, 3, and 4.

[85] Data pertaining to wind speed and direction is sourced from the Contractor's onsite meteorological station (*see* Figure 16); these wind speed observations, taken from 2009 – 2012, are assumed to be indicative of the year-over-year conditions that would typically been seen during any radon measurement exercise. Radon measurements, as reported by ERG (2013), were from various 90-day periods from 2009 to 2012. Thus, correlating *average* aeolic conditions to *average* radon measurements taken over approximately the same period of time would seem to be defensible, especially in the absence of better data. Correlating daily, hourly, or even synchronous real-time aeolic parameters to similar daily, hourly, or synchronous radon measurements would require an elaborate sampling and analysis plan with a significantly greater degree of quality assurance, effort, and financial resources. Such information is not believed to be available for the Contractor's site, nor has the additional value of such refinement been evaluated during the course of this dissertation.

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Air Dispersion Modeling Results	Reported preferences for each geographic alternative based on computer simulated air flow modeling.	***[Partially] Excluded for the following reason(s):*** ERG (2013) includes the results of an air dispersion model using AERMOD,[86] and used the AERMOD results to confirm their own conceptual model of radon dispersion (which accounted for various other parameters). Unfortunately, AERMOD can only model radon as a neutrally buoyant gas, and therefore cannot account for any dynamics associated with its heavier-than-air qualities (ERG, 2013), which would be especially important in fluidic systems. This dissertation does not make use of air dispersion modeling, as this would be highly technical and slightly beyond the scope of the MCDM / RDM focus. (However, in similar "confirmatory" fashion to ERG (2013), the discussions found in the conclusion of this dissertation will reflect back upon the AERMOD results presented in ERG (2013) for comparison to the MCDM-modeled results.)
Ecological Impacts	Values, either calculated or estimated, that are typically considered when ascribing a quantitative measure of risk to one or more species of flora or fauna exposed to a contaminant of concern.	***Excluded for the following reason(s):*** *See* Notes 2 and 3.
PRP / Corporate Responsibility	Values, either real or perceived, that may be considered in a decision-making model to reflect the impact that a particular alternative may have on a PRP's Social License To Operate (SLTO).[87]	***Excluded for the following reason(s):*** *See* Notes 2, 3, and 4.
Estimates on Remedial Solution Costs	Estimated Lifetime Remediation Costs (LRC) associated with a particular decision alternative.	***Excluded for the following reason(s):*** *See* Notes 2, 3, and 4.

[86] AERMOD stands for American Meteorological Society/EPA Regulatory Model and is a software program designed to model air dispersion.

[87] SLTO refers to the practices of organizations that affect their reputations in the communities in which they operate; in the age of globalization and social media, SLTO is gaining prominence in businesses as it affects commerce and trade. The importance (and therefore the utility) of SLTO will vary from one organization to another.

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Groundwater Contamination	Measurable contributions to radon concentrations from groundwater bearing radon and radon parent isotopes.	***Excluded for the following reason(s):*** Groundwater contamination is not believed to significantly contribute to the amount of airborne radon present in the vicinity of the Contractor's site. (*See* Section 3.4.3.6 and Table 21 for a more detailed explanation.)
Geology (Geologic Consistency)	Data pertaining to the characterization and composition of geologic and lithologic formations (and strata) underlying the surface of the earth.	***Excluded for the following reason(s):*** As supported by a large body of work spanning more than six decades, it is assumed that the underlying geology of all sampling points is generally consistent. The measured ^{222}Rn concentrations taken across several square miles of land indicate the absence any localized hydrogeological anomalies.
Temperature	Recorded temperature values in the region during data period.	***Exlcuded for the following reason(s):*** *See* Notes 1 and 3.
Cloud Cover Data	Reported or measured cloud cover percentage per unit time for a given geographic area.	***Excluded for the following reason(s):*** *See* Notes 1,[88] 2, and 3.
Diurnal Changes	Measurable changes in radon concentrations between night and day.	***Excluded for the following reason(s):*** *See* Notes 1, 2, and 3.
Seasonal Variations	Measurable changes in radon concentrations throughout different times of the year.	***Excluded for the following reason(s):*** *See* Notes 1, 2, and 3.
Barometric Pressure	Data pertaining to the force per square area associated with the column of natural atmospheric gases bearing down on a particular area of interest.	***Excluded for the following reason(s):*** *See* Notes 1, 2, and 3.
Socio-Political Factors	Values, either real or perceived, that may be considered in a decision-making model to reflect the impact that a particular alternative may have on a community's reputation, economy, or system of governance.	***Excluded for the following reason(s):*** *See* Notes 2, 3, and 4.

[88] ERG (2013) made use of cloud cover data that it retrieved from the National Weather Service station in Albuquerque, New Mexico and considered this data to be indicative of cloud cover for the San Mateo Basin (which is approximately 80 miles west-northwest of Albuquerque).

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Nuclear Transformations	Measurements related to the actual number of disintegrations of airborne radon and airborne RDP nuclei within the geographic area of observation *v.* the total abundance of airborne radon and RDPs measured in the same area.[89]	***Excluded for the following reason(s):*** *See* Notes 1, 2 and 4. • Would require a profound financial investment in sophisticated instrumentation along with an elaborate sampling and analysis plan. • Modeling of the system would be required[90] (as it would be practically impossible to collect the required data in the natural environment, *esp.* one whose area occupies roughly 400 square miles). Data pertaining to the rate, mode, and/or probability of nuclear transformations of radon have generally been well established by researchers and are widely accepted by the scientific community. At great financial cost, the purpose of collecting this data and taking such measurements would be to: • Place less reliance on the stochastic aspects for this specific situation; • Place more reliance on the deterministic aspects for this specific situation; • Better inform the decision attributes related to flow and transport modeling for radon and RDP dispersions in air; and • Better inform the health risk, toxicological, and ecological decision attributes. This data could represent a possible decision attribute for a real-life decision problem similar to that of the case study but noting the cost and effort required, it would seem consideration of this data might be better suited for a different decision problem.

[89] Even though the λ values of isotopes in the ^{238}U decay series are well established and widely accepted, they are nevertheless stochastic (*i.e.,* based on probabilities and sophisticated guesswork); the most meaningful value of the comparison of these measurements would be to inform subsequent decision attributes related to the BEIR (specifically, from radon and RDPs) but even then, only in a descriptive and retrospective manner. Use of the widely accepted λ values would be akin to using prescriptive decision theories—they inform decision-makers how frequently nuclear transformations *ought* to occur, whereas the comparison of the measurements discussed above would only serve to explain the nuclear lifespan, mode of transport, and ultimate fate of those specific radionuclides observed, much the same way a descriptive decision theory tends to look back upon a decision that has already been made in an attempt to psychoanalyze it. Furthermore, noting how examination of decisions via descriptive theories can sometimes be used to draw parallels to other decisions with similar circumstances, it is sometimes overlooked that in reality, such examinations are only truly valid for the specific decision under scrutiny, so too would be the case of comparing actual disintegrations of a given radionuclide *v.* the total abundance of said radionuclide. In reality, the probabilistic nature of radioactive decay, dictates such measurements would only be valid for that specific situation for that specific time.

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
Geochemical Considerations	Accounting and evaluation of the chemical interactions taking place between the subterranean geological formations and the passing movement of groundwater and how those interactions affect the solubility (and mobility) of radon and radon parent isotopes within those formations.	***Excluded for the following reason(s):*** *See* Notes 1, 2, and 3.
Soil Type	Measurements of radon concentration and rates of exhalation due to soil classification (*e.g.,* sandy, loamy, clayey, *etc.*)	***Excluded for the following reason(s):*** *See* Notes 1 and 3. A value for radon exhalation from the soil was assumed based on data published in Hassan *et al.* (2009). This is deemed to be sufficient for the needs of this dissertation.
Soil Moisture	Measurements of radon concentration and rates of exhalation due to soil moisture content.	***Excluded for the following reason(s):*** *See* Notes 1 and 3. A value for radon exhalation from the soil was assumed based on data published in Hassan *et al.* (2009). This is deemed to be sufficient for the needs of this dissertation.
Laboratory Methods	Values ascribed to the analytical measurement techniques used by various labs to measure radon, the margin of error associated with those techniques and the value ascribed by the decision-maker(s) to the importance of these considerations.	***Excluded for the following reason(s):*** *See* Notes 1, 2, 3, and 4.

[90] Any model would inextricably require some degree of abstraction, which could be viewed as self-defeating when noting the overall purpose of the measurements is to decrease the degree of stochasticity.

Table 21 (Cont'd). Specimen: Decision Attributes for MCDM Modeling.

Attribute	Description	Reason for Inclusion / Exclusion
QA / QC Concerns	The degree of confidence, either measured or estimated, with respect to: • The radon measurements taken; • The calibration techniques of the measurement instrumentation used; • The level of proficiency and training given to the person collecting the data; • The level of supervision during the data collection efforts; • The manner and method in which data verification was ensured; and • The value ascribed by the decision-maker(s) to the importance of each of these considerations.	***Excluded for the following reason(s):*** *See* Notes 1, 2, 3, and 4.

Notes:

1. Data was either not found to be publicly available for the point of interest, or was deemed to be insufficient for the needs of the dissertation.
2. Were the data available, the impact of its inclusion is not believed to be of consequence to the MCDM method discussion of this dissertation, the answer to this dissertation's problem statement, or the response to the null hypotheses posited herein.
3. Unnecessary for the needs of this dissertation, but assuming a decision problem similar to the case study presented in this dissertation, collection, evaluation, and consideration of this data as a decision attribute would provide a greater degree of robustness and comprehensiveness to any real-life practical application of the MCDM methods discussed in this research.
4. Ascribing a realistic and reasonable value for this decision attribute (*i.e.,* one that would be reasonably accepted by the key stakeholders involved) would likely require a more sophisticated means of eliciting values for utilities, preferences, and weighting factors, *etc.* than have otherwise been used in this dissertation. This effort would likely require the coordinated efforts of several decision-makers. Discussion of such elicitation techniques is beyond the scope of this dissertation.

3.4.6. Tabularized Data for Specimen

The following tables extract the relevant data from the previous discussion on the selected aspects of the specimen and will serve, in part, as necessary inputs to the MAUT-ANP model discussed in the next section. These tables are introduced as follows:

- Table 23 below summarizes the measured ^{222}Rn concentrations at the selected radon monitoring locations that are depicted in Figures Figure ***15*** and Figure *19* above.
- Table 24 summarizes the calculated differences in elevation (measured in feet) of every point to every other point based on the elevation data listed in Table 23.
- Table 25 summarizes the calculated differences in horizontal distance (measured in feet) of every point to every other point based on the geographic coordinates listed in Table 23.
- Tables Table ***26*** and Table ***27*** summarize various aspects of the aeolic data illustrated on the wind rose shown in
- Figure ***16***.
- Tables Table ***28***, Table ***29***, Table ***30***, and Table ***31*** present the wind speed, *n*, categories and estimated number of windward hours for each data point relative to: (1) the LTP, (2) 5-Off, (3), 6-Off, and (4) 4-Off, respectively.

Table 23. Specimen: Summary of Radon Measurements from Selected Locations. [91, 92]

Loc. ID	Latitude °N	Longitude °E	Elevation (ft. MSL)	$^{222}Rn_{air}$ (pCi/L)
1	35.25335	-107.86286	6,594	1.43
2	35.25030	-107.85052	6,590	1.54
3	35.24124	-107.84856	6,608	1.09
4	35.22942	-107.87106	6,563	1.6
5	35.23634	-107.87231	6,569	1.49
6	35.24333	-107.87985	6,573	1.37
7	35.23394	-107.85641	6,579	1.17
1A	35.25955	-107.86280	6,602	1.25
1-Off	35.27104	-107.84145	6,620	1.49
2-Off	35.27083	-107.82987	6,632	0.8
3-Off	35.26017	-107.81390	6,740	0.67
4-Off	35.24262	-107.78817	6,804	0.63
5-Off	35.27809	-107.87108	6,653	1.53
6-Off	35.28089	-107.84035	6,639	1.33
16	35.27402	-107.88121	6,738	0.96

[91] Radon measurements presented in Table 23 have been excerpted from ERG (2013); ERG (2013) should be consulted for specific details pertaining to the manner and method in which data was gathered, calculated, the instruments used, and other related matters. Geographic coordinates and elevation data presented in Table 23 was obtained by superimposing and approximating the data point locations of Figure 15 onto the interactive geographic database provided by Nathansen (2018). These values are assumed to be sufficient for the needs of this dissertation.

[92] Values presented in Table 23 for Locations 4, 5, and 16 were calculated by taking the average of the two values given in Table 4-2 of ERG (2013) under the column headings "ERG Detector Average Radon Concentration" and "HMC Detector Average Radon Concentration." The values presented in Table 23 are assumed to be sufficient for the needs of this dissertation.

Table 24. Specimen: Summary of Elevational Relationships (Measured in Feet) between Data Points.[93, 94]

L. ID	LTP	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	4-Off	5-Off	6-Off	16
LTP	0	86	90	72	117	111	107	101	78	60	48	-60	-124	27	41	-58
1	-86	0	4	-14	31	25	20	15	-9	-27	-38	-146	-211	-59	-45	-144
2	-90	-4	0	-18	28	21	17	11	-12	-30	-42	-150	-214	-62	-49	-147
3	-72	14	18	0	46	39	35	29	6	-12	-24	-132	-196	-44	-31	-129
4	-117	-31	-28	-46	0	-6	-11	-16	-40	-58	-69	-177	-242	-90	-76	-175
5	-111	-25	-21	-39	6	0	-5	-10	-33	-52	-63	-171	-236	-84	-70	-169
6	-107	-20	-17	-35	11	5	0	-6	-29	-47	-58	-167	-231	-79	-66	-164
7	-101	-15	-11	-29	16	10	6	0	-23	-41	-53	-161	-225	-73	-60	-158
1A	-78	9	12	-6	40	33	29	23	0	-18	-30	-138	-202	-50	-37	-135
1-Off	-60	27	30	12	58	52	47	41	18	0	-11	-120	-184	-32	-19	-117
2-Off	-48	38	42	24	69	63	58	53	30	11	0	-108	-173	-21	-7	-106
3-Off	60	146	150	132	177	171	167	161	138	120	108	0	-64	88	101	3
4-Off	124	211	214	196	242	236	231	225	202	184	173	64	0	152	165	67
5-Off	-27	59	62	44	90	84	79	73	50	32	21	-88	-152	0	13	-85
6-Off	-41	45	49	31	76	70	66	60	37	19	7	-101	-165	-13	0	-98
16	58	144	147	129	175	169	164	158	135	117	106	-3	-67	85	98	0

[93] For purposes of elevation, the relative elevational position of the observation matters with respect to the corresponding point (i.e., it matters if one point is higher than or lower than another).

[94] The LTP stands approximately 90 feet tall above ground level; as reported by various sources (*e.g.,* ERG, 2013; HMC & Hydro-Engineering, 2013; *et al.*), the side slopes of the LTP are capped with protective layers of earthen material and rocks that hinder the release of radon. Accordingly, elevational coordinates (and therefore elevational relationships) for the LTP are based on the elevation at the top of the LTP, *i.e.* approximately 6,680 ft. MSL.

Table 25. Specimen: Summary of Horizontal Distances (Measured in Feet) between Data Points.[95, 96]

L. ID	LTP	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	4-Off	5-Off	6-Off	16
LTP	0	3,554	4,821	4,844	5,546	3,546	4,583	4,288	5,799	12,106	14,303	16,257	22,796	12,678	15,344	12,117
1		0	3,846	6,139	9,046	6,804	6,247	7,320	2,257	9,072	11,725	14,826	22,640	9,333	12,067	9,306
2			0	3,353	9,766	8,256	9,116	6,208	4,977	8,019	9,686	11,508	18,826	11,829	11,539	12,586
3				0	7,979	7,314	9,374	3,542	7,908	11,053	12,130	12,432	18,038	15,005	14,639	15,408
4					0	2,545	5,700	4,675	11,239	17,539	19,452	20,410	25,215	17,713	20,856	16,512
5						0	3,396	4,827	8,912	15,634	17,837	19,478	25,229	15,200	18,814	13,970
6							0	7,787	7,794	15,269	17,967	20,621	27,375	12,920	18,053	11,178
7								0	9,513	14,221	15,589	15,881	20,621	16,653	17,746	16,357
1A									0	7,624	10,654	14,601	23,119	7,185	10,259	7,610
1-Off										0	3,457	9,126	18,974	9,208	3,600	11,917
2-Off											0	6,146	16,137	12,581	4,816	15,368
3-Off												0	9,991	18,271	10,918	20,715
4-Off													0	27,915	20,896	30,035
5-Off														0	9,228	3,367
6-Off															0	12,449
16																0

[95] For horizontal measurements, no distinction must be made with respect to the relative position of the observer (*i.e.,* horizontal orientation is irrelevant). As such, it can be seen that only half of the values for Table 25 are necessary.

[96] Coordinates (and therefore distances) associated with the LTP are based on the approximate geographic center of the LTP.

Table 26. Specimen: Interpreted Number of Hours the Wind Blew from Given Directions.

Wind Speed Category	Wind Speed (m / s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
***n*-Cat 0**	**Calm**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
***n*-Cat I**	**0.5 - 2.1**	445	614	1148	1164	825	340	259	215	215	202	243	226	243	323	356	344
***n*-Cat II**	**2.1 - 3.6**	243	291	162	202	129	20	53	251	283	162	81	81	97	129	283	259
***n*-Cat III**	**3.6 - 5.7**	437	323	107	32	24	20	162	485	323	162	202	216	340	299	340	348
***n*-Cat IV**	**5.7 - 8.8**	40	32	18	0	0	0	97	275	113	81	186	243	307	162	162	162
***n*-Cat V**	**8.8 - 11.1**	0	0	0	0	0	0	16	32	13	16	53	81	53	40	32	20
***n*-Cat VI**	**> 11.1**	0	0	0	0	0	0	0	13	13	13	53	73	40	13	11	0

Table 27. Specimen: Interpreted Percentage of Time the Wind Blew from Given Directions.

Wind Speed Category	Wind Speed (m / s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
***n*-Cat 0**	**Calm**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
***n*-Cat I**	**0.5 - 2.1**	2.75%	3.80%	7.10%	7.20%	5.10%	2.10%	1.60%	1.33%	1.33%	1.25%	1.50%	1.40%	1.50%	2.00%	2.20%	2.13%
***n*-Cat II**	**2.1 - 3.6**	1.50%	1.80%	1.00%	1.25%	0.80%	0.13%	0.33%	1.55%	1.75%	1.00%	0.50%	0.50%	0.60%	0.80%	1.75%	1.60%
***n*-Cat III**	**3.6 - 5.7**	2.70%	2.00%	0.66%	0.20%	0.15%	0.13%	1.00%	3.00%	2.00%	1.00%	1.25%	1.33%	2.10%	1.85%	2.10%	2.15%
***n*-Cat IV**	**5.7 - 8.8**	0.25%	0.20%	0.11%	0.00%	0.00%	0.00%	0.60%	1.70%	0.70%	0.50%	1.15%	1.50%	1.90%	1.00%	1.00%	1.00%
***n*-Cat V**	**8.8 - 11.1**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.20%	0.08%	0.10%	0.33%	0.50%	0.33%	0.25%	0.20%	0.13%
***n*-Cat VI**	**> 11.1**	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	0.08%	0.08%	0.33%	0.45%	0.25%	0.08%	0.07%	0.00%

Table 28. Specimen: Number of Hours Wind Blew Over the LTP and Toward a Given Data Point per Stated Wind Speed Category.

	Wind Speed, *n*, (m / s)						
Loc. ID	**Calm**	**0.5 - 2.1**	**2.1 - 3.6**	**3.6 - 5.7**	**5.7 - 8.8**	**8.8 - 11.1**	**> 11.1**
1	0	875	776	1172	655	115	92
2	0	469	162	418	429	134	126
3	0	922	509	978	631	126	65
4	0	1059	534	760	73	0	0
5	0	3371	897	899	91	0	0
6	0	825	129	24	0	0	0
7	0	788	501	784	202	20	0
1A	0	632	695	970	469	61	39
1-Off	0	445	243	364	267	70	66
2-Off	0	469	162	418	429	134	126
3-Off	0	226	81	216	243	81	73
4-Off	0	243	97	340	307	53	40
5-Off	0	430	534	809	388	45	26
6-Off	0	445	243	364	267	70	66
16	0	474	304	647	372	49	13

Table 29. Specimen: Number of Hours Wind Blew Over 5-Off and Toward a Given Data Point per Stated Wind Speed Category.

	Wind Speed, *n*, (m / s)						
Loc. ID	**Calm**	**0.5 - 2.1**	**2.1 - 3.6**	**3.6 - 5.7**	**5.7 - 8.8**	**8.8 - 11.1**	**> 11.1**
1	0	788	501	784	202	20	0
2	0	356	283	340	162	32	11
3	0	356	283	340	162	32	11
4	Shielded by LTP (with 5-Off as point of origin, LTP casts a “radon shadow”)						
5							
6	0	614	291	323	32	0	0
7	Shielded by LTP (with 5-Off as point of origin, LTP casts a “radon shadow”)						
1A	0	788	501	784	202	20	0
1-Off	0	243	97	340	307	53	40
2-Off	0	243	97	340	307	53	40
3-Off	0	243	97	340	307	53	40
4-Off	0	226	81	216	243	81	73
5-Off	N/A Point of Origin						
6-Off	0	469	178	555	550	134	113
16	0	1164	202	32	0	0	0

Table 30. Specimen: Number of Hours Wind Blew Over 6-Off and Toward a Given Data Point per Stated Wind Speed Category.

	Wind Speed, *n*, (m / s)						
Loc. ID	**Calm**	**0.5 - 2.1**	**2.1 - 3.6**	**3.6 - 5.7**	**5.7 - 8.8**	**8.8 - 11.1**	**> 11.1**
1	0	1148	162	107	18	0	0
2	0	614	291	323	32	0	0
3	0	445	243	437	40	0	0
4	Shielded by LTP (with 5-Off as point of origin, LTP casts a "radon shadow")						
5							
6	0	1148	162	107	18	0	0
7	0	614	291	323	32	0	0
1A	0	1148	162	107	18	0	0
1-Off	0	2207	695	867	91	0	0
2-Off	0	323	129	299	162	40	13
3-Off	0	356	283	340	162	32	11
4-Off	0	344	259	348	162	20	0
5-Off	0	825	129	24	0	0	0
6-Off	N/A Point of Origin						
16	0	1164	202	32	0	0	0

Table 31. Specimen: Number of Hours Wind Blew Over 4-Off and Toward a Given Data Point per Stated Wind Speed Category.

	Wind Speed, *n*, (m / s)						
Loc. ID	**Calm**	**0.5 - 2.1**	**2.1 - 3.6**	**3.6 - 5.7**	**5.7 - 8.8**	**8.8 - 11.1**	**> 11.1**
1	0	340	20	20	0	0	0
2	0	340	20	20	0	0	0
3	0	825	129	24	0	0	0
4	0	1164	202	32	0	0	0
5	0	825	129	24	0	0	0
6	Shielded by LTP (with 5-Off as point of origin, LTP casts a "radon shadow")						
7	0	825	129	24	0	0	0
1A	0	340	20	20	0	0	0
1-Off	0	215	251	485	275	32	13
2-Off	0	215	283	323	113	13	13
3-Off	0	430	534	809	388	45	26
4-Off	N/A Point of Origin						
5-Off	0	259	53	162	97	16	0
6-Off	0	215	251	485	275	32	13
16	Not readily aligned with any wind data.						

3.5. Data Check

In the interests of providing a better picture of the statistical range of the data, two often-used statistical metrics have been calculated for the selected data above, which are deemed to be of importance to the MCDM process. One of the most common methods to determine statistical outliers is six-sigma (6σ), which holds that any data point lying greater than three standard deviations from either side of the mean (greater than 3σ from μ) is considered a potential outlier. A second commonly used method to determine statistical outliers is via the interquartile range (IQR). Under the IQR method, any data point that is greater than 1.5 times the IQR plus the third quartile value or less than 1.5 times the IQR minus the first quartile value is considered a potential outlier.

Using the data provided above in Tables Table ***23***, Table ***24***, Table ***25***, Table ***26***, Table ***27***, Table ***28***, Table ***29***, Table ***30***, and Table ***31***, Table 32 presents the results of statistical calculations with respect to $\boldsymbol{C}_{\text{Rn-222}}$, Elevation, and Distances from the LTP, 5-Off, 6-Off, and 4-Off.

Table 32. Specimen: Check for Potential Outliers with respect to Measured $C_{Rn\text{-}222}$, Elevation, and Key Distances.

Loc. ID	Meas. $C_{Rn\text{-}222}$ [in air] (pCi/L)	Elevation (ft. MSL)	Distance from LTP (ft.)	Distance from 5-Off (ft.)	Distance from 6-Off (ft.)	Distance from 4-Off (ft.)
1	1.43	6,594	3,554	9,333	12,067	22,640
2	1.54	6,590	4,821	11,829	11,539	18,826
3	1.09	6,608	4,844	15,005	14,639	18,038
4	1.6	6,563	5,546	17,713	20,856	22,215
5	1.49	6,569	3,546	15,200	18,814	25,229
6	1.37	6,573	4,583	12,290	18,053	27,375
7	1.17	6,579	4,288	16,653	17,746	20,621
1A	1.25	6,602	5,799	7,185	10,259	23,119
1-Off	1.49	6,620	12,106	9,208	3,600	18,974
2-Off	0.8	6,632	14,303	12,581	4,816	16,137
3-Off	0.67	6,740	16,257	18,271	10,918	9,991
16	0.96	6,738	12,117	3,367	12,449	30,035
Mean	1.2383	6,617	7,647	12,386	12,980	21,100
Median	1.3100	6,598	5,195	12,436	12,258	21,418
Mode	1.4900	N/A	N/A	N/A	N/A	N/A
Variance	0.0852	3,347	19,684,353	18,680,495	26,396,024	25,940,597
Standard Deviation	0.2918	58	4,437	4,322	5,138	5,093
μ - 3σ	0.3628	6,444	-5,663	-580	-2,433	5,820
μ + 3σ	2.1138	6,791	20,957	25,353	28,393	36,380
Q_1	1.0575	6,578	4,509	9,302	10,753	18,629
Q_3	1.4900	6,623	12,109	15,563	17,823	23,647
IQR	0.4325	46	7,600	6,262	7,070	5,018
Q_1 - 1.5*IQR	0.4088	6,509	-6,890	-91	149	11,103
Q_3 + 1.5*IQR	1.0575	6,578	4,509	9,302	10,753	18,629
Potential Outliers	Yes	Yes	Yes	Yes	Yes	Yes

As indicated in Table 32, there are potential statistical outliers present in every single category. These data points have all been reviewed, and for the needs of this dissertation, these data points are deemed acceptable and will not be excluded from consideration at this point in time.

Similar statistical calculations are also required for the windward exposure hours with respect to given points. As such, Tables, Table ***33***, Table ***34***, Table ***35***, and Table ***36*** are presented below which base their inputs on the data presented in Tables Table ***28***, Table ***29***, Table ***30***, and Table ***31***, respectively. To conserve space and simplify the analysis, the wind speed category of "calm" has been excluded from Tables, Table ***33***, Table ***34***, Table ***35***, and Table ***36*** below because, as indicated in Tables Table ***28***, Table ***29***, Table ***30***, and Table ***31*** above, there were no recorded number of hours for this wind speed category.

Table 33. Specimen: Check for Potential Outliers with respect to Windward Exposure from the LTP, *f* (*n*-Cat).

Loc. ID	*n*-Cat I (hrs.)	*n*-Cat II (hrs.)	*n*-Cat III (hrs.)	*n*-Cat IV (hrs.)	*n*-Cat V (hrs.)	*n*-Cat VI (hrs.)
1	875	776	1,172	655	115	92
2	469	162	418	429	134	126
3	922	509	978	631	126	65
4	1,059	534	760	73	0	0
5	3,371	897	899	91	0	0
6	825	129	24	0	0	0
7	788	501	784	202	20	0
1A	632	695	970	469	61	39
1-Off	445	243	364	267	70	66
2-Off	469	162	418	429	134	126
3-Off	226	81	216	243	81	73
16	474	304	647	372	49	13
Mean	880	416	638	322	66	50
Median	710	403	704	320	66	52
Mode	469	162	418	429	0	0
Variance	619,293	69,558	111,861	41,341	2,582	2,151
Standard Deviation	787	264	334	203	51	46
μ - 3σ	-1481	-375	-366	-288	-87	-89
μ + 3σ	3240	1207	1641	932	218	189
Q_1	469	162	404.5	174.25	15	0
Q_3	887	574	917	439	118	78
IQR	418	412	512	265	103	78
Q_1 - 1.5*IQR	-158	-456	-364	-223	-139	-117
Q_3 + 1.5*IQR	469	162	405	174	15	0
Potential Outliers	Yes	Yes	Yes	Yes	Yes	Yes

Table 34. Specimen: Check for Potential Outliers with respect to Windward Exposure from 5-Off, *f* (*n*-Cat).

Loc. ID	*n*-Cat I (hrs.)	*n*-Cat II (hrs.)	*n*-Cat III (hrs.)	*n*-Cat IV (hrs.)	*n*-Cat V (hrs.)	*n*-Cat VI (hrs.)
1	788	501	784	202	20	0
2	356	283	340	162	32	11
3	356	283	340	162	32	11
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	614	291	323	32	0	0
7	0	0	0	0	0	0
1A	788	501	784	202	20	0
1-Off	243	97	340	307	53	40
2-Off	243	97	340	307	53	40
3-Off	243	97	340	307	53	40
16	1,164	202	32	0	0	0
Mean	400	196	302	140	22	12
Median	300	150	340	162	20	0
Mode	0	0	340	0	0	0
Variance	124,033	29,575	68,235	15,199	459	280
Standard Deviation	352	172	261	123	21	17
$\mu - 3\sigma$	-657	-320	-482	-230	-42	-38
$\mu + 3\sigma$	1456	712	1086	510	86	62
Q_1	182	73	24	0	0	0
Q_3	658	285	340	228	37	18
IQR	475	212	316	228	37	18
Q_1 - 1.5*IQR	-531	-246	-450	-342	-56	-27
Q_3 + 1.5*IQR	182	73	24	0	0	0
Potential Outliers	Yes	Yes	Yes	Yes	Yes	Yes

Table 35. Specimen: Check for Potential Outliers with respect to Windward Exposure from 6-Off, $f\,(n\text{-Cat})$.

Loc. ID	*n*-Cat I (hrs.)	*n*-Cat II (hrs.)	*n*-Cat III (hrs.)	*n*-Cat IV (hrs.)	*n*-Cat V (hrs.)	*n*-Cat VI (hrs.)
1	1,148	162	107	18	0	0
2	614	291	323	32	0	0
3	445	243	437	40	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	1,148	162	107	18	0	0
7	614	291	323	32	0	0
1A	1,148	162	107	18	0	0
1-Off	2,207	695	867	91	0	0
2-Off	323	129	299	162	40	13
3-Off	356	283	340	162	32	11
16	1,164	202	32	0	0	0
Mean	764	218	245	48	6	2
Median	614	182	203	25	0	0
Mode	1148	162	107	18	0	0
Variance	363,310	29,639	55,867	3,169	183	20
Standard Deviation	603	172	236	56	14	4
$\mu - 3\sigma$	-1044	-298	-464	-121	-35	-11
$\mu + 3\sigma$	2572	735	954	217	47	15
Q_1	348	154	88	14	0	0
Q_3	1148	285	327	53	0	0
IQR	800	131	239	39	0	0
Q_1 - 1.5*IQR	-853	-43	-270	-45	0	0
Q_3 + 1.5*IQR	348	154	88	14	0	0
Potential Outliers	Yes	Yes	Yes	Yes	Yes	Yes

Table 36. Specimen: Check for Potential Outliers with respect to Windward Exposure from 4-Off, *f* (*n*-Cat).

Loc. ID	*n*-Cat I (hrs.)	*n*-Cat II (hrs.)	*n*-Cat III (hrs.)	*n*-Cat IV (hrs.)	*n*-Cat V (hrs.)	*n*-Cat VI (hrs.)
1	340	20	20	0	0	0
2	340	20	20	0	0	0
3	825	129	24	0	0	0
4	1,164	202	32	0	0	0
5	825	129	24	0	0	0
6	0	0	0	0	0	0
7	825	129	24	0	0	0
1A	340	20	20	0	0	0
1-Off	215	251	485	275	32	13
2-Off	215	283	323	113	13	13
3-Off	430	534	809	388	45	26
16	0	0	0	0	0	0
Mean	460	143	148	65	8	4
Median	340	129	24	0	0	0
Mode	340	20	20	0	0	0
Variance	123,553	22,875	61,138	15,730	212	66
Standard Deviation	352	151	247	125	15	8
$\mu - 3\sigma$	-595	-311	-593	-312	-36	-20
$\mu + 3\sigma$	1514	597	890	441	51	29
Q_1	215	20	20	0	0	0
Q_3	825	214	105	28	3	3
IQR	610	194	85	28	3	3
Q_1 - 1.5*IQR	-700	-271	-107	-42	-5	-5
Q_3 + 1.5*IQR	215	20	20	0	0	0
Potential Outliers	Yes	Yes	Yes	Yes	Yes	Yes

It is important to identify potential outliers, even if they are eventually admitted into an evaluation. Tables, Table ***32***, Table ***33***, Table ***34***, Table ***35***, and Table ***36*** above can now be used as references moving forward with the MCDM models. That is to say, even though the potential outliers have not been excluded from consideration, the fact that they have been flagged may provide context in the event the decision criteria they are based on needs to be modified. In other words, whatever ultimate decision an MCDM model points to as a rational choice, is really only as good as the data supporting it. The old adage of "garbage in, garbage out," or GIGO, is important to remember. With all the input data having been presented and now having also been checked for potential outliers, this dissertation can now proceed to testing the MCDM models and combinational hybrid approaches.

3.6. Analysis via MAUT

While it often goes unmentioned, it is usually a helpful first step in any MCDM process is to depict the decision problem pictorially. Using the process illustrated in Figure 9 as a guide, the general arrangement for the particular decision problem at hand is illustrated below in Figure 20.

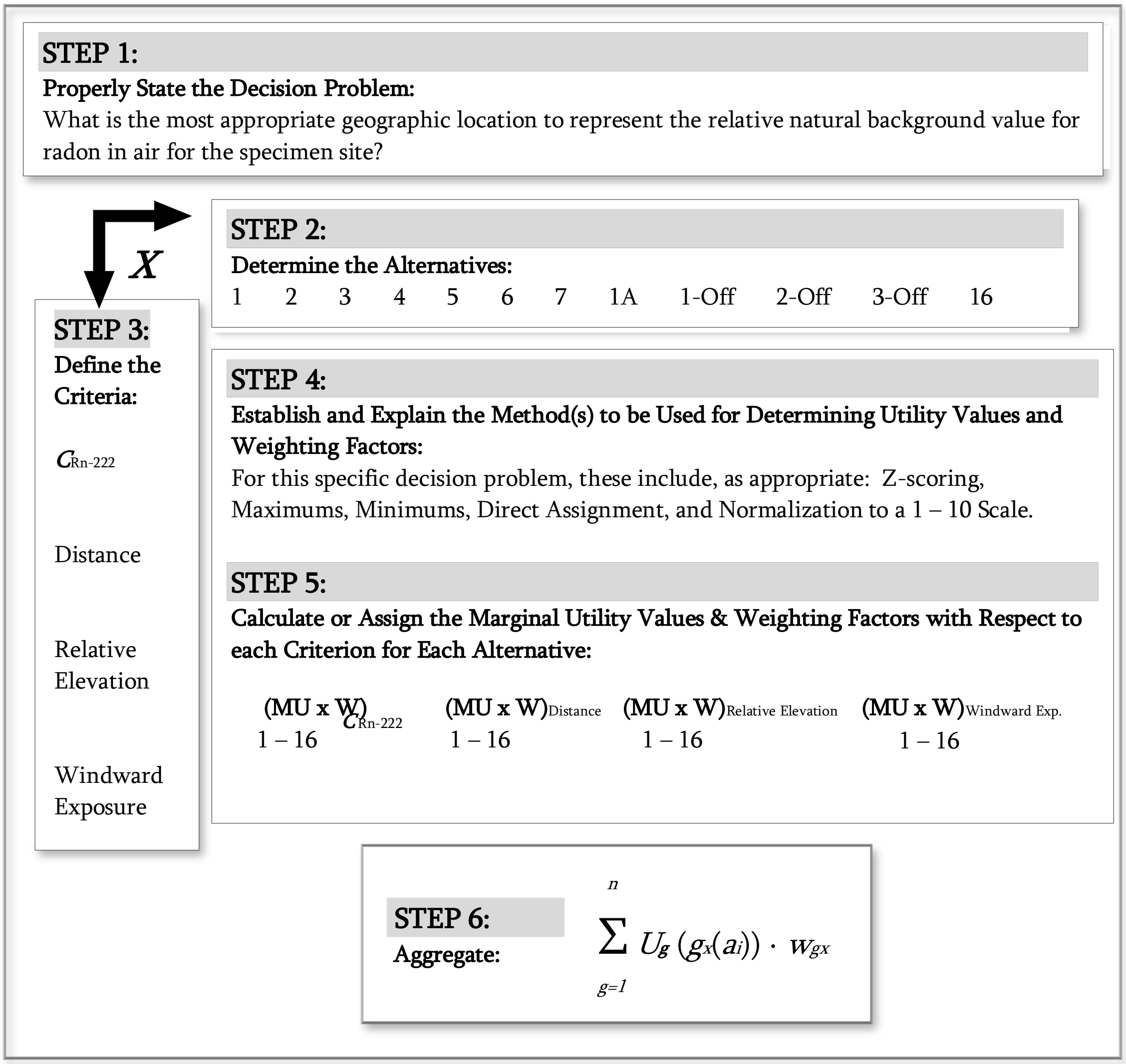

Figure 20. MAUT Decision Model for Dissertation Problem Statement.

As illustrated in Figure 20, the first step in the MAUT process is to properly state the decision problem. The next step is to identify the alternatives, which for the situation at hand, are merely the 12 different locations that have radon measurements associated with them that are not considered anthropogenic sources (*i.e.,* locations 5-Off, 6-Off, 4-Off, and the LTP are not considered alternatives). The next step in the MAUT process is to identify and define the criteria associated with each alternative. As illustrated, there are four criteria against which each alternative will be screened (*see* Table 22); broadly stated, these are: (1) the $\boldsymbol{C}_{\text{Rn-222}}$, (2) distance [from the source], (3) elevation, and (4) influence of wind speed and direction. Determining the weighting factors for each of the criteria is the next step, followed lastly by additive aggregation, *i.e.,* multiplying the value of each utility score by the respective criterion weight and then summing to obtain a global utility score.

As discussed in

CHAPTER 2, there are several methods to do determine the value of each criterion and weighing factor, including: stakeholder elicitation, personal preferences, direct assignment, *etc.*; utility values can be ascribed by individuals, via committee, via a selected groups of subject matter experts and even by other MCDMs. For the purposes of the example scenario under study, utility values and weighting factors were determined by an individual decision-maker, namely, the author of this research.

Sticking with the order in which they were presented above (*see* Table 22), the utility factors associated with each criterion are introduced as follows:

- Table 37 summarizes the logic used to choose MU values for the MAUT analysis.
- Table 38 presents the Marginal Utility (MU) values associated with the measured radon concentration values.
- Tables Table ***39***Table 40Table 41, and Table ***42***present the MU values associated with proximity to: (1) the LTP, (2) 5-Off, (3), 6-Off, and (4) 4-Off, respectively.
- Table 43 presents the MU values associated with elevation.
- Tables 38, 39, 40, and 41 present the MU values associated with windward exposure as a function of wind speed category for: (1) the LTP, (2) 5-Off, (3) 6-Off, and (4) 4-Off.

Table 37. Summary of Rationale for Selection of MU Values for the MAUT Analysis.

Decision Attribute	MU Value Selection Logic	Method
^{222}Rn Concentration	Data points closest to the mean are deemed of highest utility. Deviations from the mean would represent bias.	Normalization of the absolute value of the inverse Z-score, 1 – 10.
Distance from Anthropogenic Source	The farthest waypoint is assigned the highest utility. Proximity to an anthropogenic source would introduce bias.	Normalization of the distance measurements, 1 – 10.

Elevational Relationship	With respect to each anthropogenic source relative to all data points, the data points closest to the mean are deemed of highest utility (*see* Figure 20). Deviations from the mean would represent bias. Merely assigning the highest MU value to the mean without respect to an anthropogenic source would also introduce bias.	Normalization of the absolute value of the inverse Z-score, 1 – 10.
Wind Speed and Direction	As a function of wind speed and with respect to any given data point relative to an anthropogenic source, lowest utility is assigned to the location that is subjected to the most windward hours at the highest wind speed category. When wind blows across an anthropogenic radon source and then toward a geographic alternative, the measured radon value at that point will be unfairly biased and is therefore undesirable.	Normalization of the number of hours recorded for each wind speed category for windward conditions at each location relative to an anthropogenic source.

Table 38. MU Values Associated with Measured ^{222}Rn Concentration Values.

Loc. ID	**Measured ^{222}Rn (in air) (pCi/L)**	**1/|Z-Score|**	**Normalized MU Value, 1 – 10**
1	1.43	1.5226	1.3707
2	1.54	0.9674	1.1667
3	1.09	1.9674	1.5341
4	1.6	0.8069	1.1078
5	1.49	1.1596	1.2373
6	1.37	2.2164	1.6256
7	1.17	4.2707	2.3802
1A	1.25	25.0139	10.0000
1-Off	1.49	1.1596	1.2373
2-Off	0.8	0.6658	1.0559
3-Off	0.67	0.5135	1.0000
16	0.96	1.0485	1.1965

As shown in Table 38, the statistical method of Z-scoring[97] was used to relate each of the data points. As discussed in CHAPTER 1, radon values, whether natural or anthropogenic, can vary greatly; and since there are several known anthropogenic and natural sources in the vicinity, it seems intuitive that values within the sample population that have closer adherence to measures of central tendency would have the greatest utility. For this reason, and as shown in Table 38, the highest utility value is assigned to the mean value of the data points. Since Z-scores can be negative and positive, in order to for the greatest Z-score to correspond to a utility value of 10, the absolute value of the inverse Z-score is calculated.

[97] A Z-score (a.k.a., *Z-test* or *Standard Score* or sometimes the *Altman Z-score*) is obtained by subtracting the raw score (*i.e.,* the value of the data point) from the mean of the population, and then dividing that quantity by the standard deviation of the population. Z-scores represent the degree by which the value of a data point differs from the mean value of the population. Values above the mean are positive; values below the mean are negative; a Z-score of zero would indicate a value identical to the population mean (Bethea, Duran, Boullion, 1995). Z-scores are useful because they incorporate common measures of central tendency to allow one data point to be compared to the other values in the group. With respect to the MAUT analysis, the highest utility value is assigned to the mean value of the data points. Since Z-scores can be negative and positive, in order to for the greatest Z-score to correspond to a utility value of 10, the absolute value of the inverse Z-score is calculated.

Clearly, the objective is to determine a location to represent the relative *natural* background for radon, then, from the available alternatives, the one most distal from an anthropogenic source would have the greatest utility, when is considered a decision attribute. Accordingly, for Tables 33 through 36, locations most distant from the point of reference are given the highest utility while the reference location itself is given the lowest utility.

Table 39. MU Values Associated with Distance from the LTP.

Loc. ID	Distance from LTP (Feet)	Normalized MU Value, 1 – 10
1	3,554	1.0057
2	4,821	1.9028
3	4,844	1.9190
4	5,546	2.4161
5	3,546	1.0000
6	4,583	1.7342
7	4,288	1.5254
1A	5,799	2.5952
1-Off	12,106	7.0609
2-Off	14,303	8.6165
3-Off	16,257	10.0000
16	12,117	7.0687

Table 40. MU Values Associated with Distance from 5-Off.

Loc. ID	Distance from 5-Off (Feet)	Normalized MU Value, 1 – 10
1	9,333	4.6027
2	11,829	6.1099
3	15,005	8.0278
4	17,713	9.6630
5	15,200	8.1455
6	12,290	6.3883
7	16,653	9.0229
1A	7,185	3.3056
1-Off	9,208	4.5272
2-Off	12,581	6.5640
3-Off	18,271	10.0000
16	3,367	1.0000

Table 41. MU Values Associated with Distance from 6-Off.

Loc. ID	Distance from 6-Off (Feet)	Normalized MU Value, 1 – 10
1	12,067	5.4160
2	11,539	5.1406
3	14,639	6.7575
4	20,856	10.0000
5	18,814	8.9350
6	18,053	8.5381
7	17,746	8.3780
1A	10,259	4.4731
1-Off	3,600	1.0000
2-Off	4,816	1.6342
3-Off	10,918	4.8168
16	12,449	5.6153

Table 42. MU Values Associated with Distance from 4-Off.

Loc. ID	Distance from 4-Off (Feet)	Normalized MU Value, 1 – 10
1	22,640	6.6796
2	18,826	4.9670
3	18,038	4.6132
4	22,215	6.4887
5	25,229	7.8420
6	27,375	8.8056
7	20,621	5.7730
1A	23,119	6.8946
1-Off	18,974	5.0335
2-Off	16,137	3.7596
3-Off	9,991	1.0000
16	30,035	10.0000

Assigning MU values to elevational relationships follows the same logic used to determine assignment of utility values for $\boldsymbol{C}_{\text{Rn-222}}$, with the highest utility assigned to the relative mean.

Table 43. MU Values Associated with Elevation.

Loc. ID	Elevation (ft. MSL)	1/|Z-Score|	Normalized MU Value, 1 – 10
1	6,594	2.4795	1.8514
2	6,590	2.1167	1.6976
3	6,608	6.1988	3.4286
4	6,563	1.0648	1.2515
5	6,569	1.1970	1.3076
6	6,573	1.3050	1.3534
7	6,579	1.5093	1.4400
1A	6,602	3.7732	2.4000
1-Off	6,620	21.6957	10.0000
2-Off	6,632	3.9447	2.4727
3-Off	6,740	0.4716	1.0000
16	6,738	0.4795	1.0033

Determining the MU values for wind is tricky. If considered in isolation, calm conditions would be deemed undesirable because the general area is not prone to calm conditions. Neither is the area prone to very windy conditions. Were this a standalone attribute considered in isolation from the physical circumstances at the site, then normally some measure of central tendency would be used to justify the value with greatest desirability. This logic accounts for the fact that nearly every location is surrounded by multiple anthropogenic sources; therefore, assigning an MU value in this manner would not be appropriate for this particular case.

Radon will naturally "flow" downhill, so in the absence of wind (*i.e.,* during calm conditions), relative elevation and gravity will influence radon measurements. Since all the data points are situated at various points in a geographic basin which exhibits relatively smooth topography (*i.e.,* none of the data points would conceivably be *wind-screened* due to abrupt changes in elevation, topographic contours, or other natural features), then what can be assumed is that any data point windward an anthropogenic source would be influenced by that source regardless of elevation, and the stronger the wind, the greater the influence. If a particular geographic alternative were constantly upwind of all proximal anthropogenic sources, it would hypothetically only come into contact with natural sources of radon, which would serve to identify a geographic location that answers the case study decision problem. Unfortunately, neither wind speed nor direction are constant for long; and regardless, for all but a few data point locations, the wind will always be toward or away from any given geographic alternative depending on the reference point of interest. Thus, for this particular MDCM problem, wind speed cannot readily be made into a decision attribute without consideration of wind direction.

The Contractor's onsite meteorological station reports the wind conditions hourly and reports the measured wind speed into seven different categories, each based on a stated range. As a decision attribute, consideration is given to the wind speed each geographic alternative experienced as a function of wind direction relative to the LTP and other point sources. Using the logic just explained, as far as wind speed and direction are concerned, the location that would have the lowest MU value would be a location that is exposed to the most windward hours at the highest wind speed category. For the MAUT, the notion of "wind speed and direction" as a decision attribute has been broken into multiple attributes, one for each wind speed category for each anthropogenic source. Normalization of the number of hours recorded for each wind speed category for windward exposure at each location relative to an anthropogenic source is then used to yield the MU value. This logic lends itself nicely to the MAUT model because each wind speed category as well as each anthropogenic source can be weighted differently. To conserve space and simplify the analysis, the wind speed category of "calm" has been excluded from Tables Table ***44***,

Table 46, and **47** below; as indicated in Tables Table ***28***, Table ***29***, Table ***30***, and Table ***31*** above, there were no recorded number of hours for this wind speed category.

Table 44. MU Values for Windward Exposure from LTP per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 0.5 < n < 2.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 2.1 < n < 3.6 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 3.6 < n < 5.7 m/s	Normalized, 10 - 1
1	875	8.1428	776	2.3346	1172	1.0000
2	469	9.3046	162	9.1066	418	6.9111
3	922	8.0083	509	5.2794	978	2.5209
4	1059	7.6162	534	5.0037	760	4.2300
5	3371	1.0000	897	1.0000	899	3.1402
6	825	8.2859	129	9.4706	24	10.0000
7	788	8.3917	501	5.3676	784	4.0418
1A	632	8.8382	695	3.2279	970	2.5836
1-Off	445	9.3733	243	8.2132	364	7.3345
2-Off	469	9.3046	162	9.1066	418	6.9111
3-Off	226	10.0000	81	10.0000	216	8.4948
16	474	9.2903	304	7.5404	647	5.1159

Table 43 (Cont'd). MU Values for Windward Exposure from LTP per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 5.7 < n < 8.8 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 8.8 < n < 11.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed n > 11.1 m/s	Normalized, 10 - 1
1	655	1.0000	115	2.2761	92	3.4286
2	429	4.1053	134	1.0000	126	1.0000
3	631	1.3298	126	1.5373	65	5.3571
4	73	8.9969	0	10.0000	0	10.0000
5	91	8.7496	0	10.0000	0	10.0000
6	0	10.0000	0	10.0000	0	10.0000
7	202	7.2244	20	8.6567	0	10.0000
1A	469	3.5557	61	5.9030	39	7.2143
1-Off	267	6.3313	70	5.2985	66	5.2857
2-Off	429	4.1053	134	1.0000	126	1.0000
3-Off	243	6.6611	81	4.5597	73	4.7857
16	372	4.8885	49	6.7090	13	9.0714

Table 45. MU Values for Windward Exposure from 5-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 0.5 < *n* < 2.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 2.1 < *n* < 3.6 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 3.6 < *n* < 5.7 m/s	Normalized, 10 - 1
1	788	3.9072	501	1.0000	784	1.0000
2	356	7.2474	283	4.9162	340	6.0969
3	356	7.2474	283	4.9162	340	6.0969
4	0	10.0000	0	10.0000	0	10.0000
5	0	10.0000	0	10.0000	0	10.0000
6	614	5.2526	291	4.7725	323	6.2921
7	0	10.0000	0	10.0000	0	10.0000
1A	788	3.9072	501	1.0000	784	1.0000
1-Off	243	8.1211	97	8.2575	340	6.0969
2-Off	243	8.1211	97	8.2575	340	6.0969
3-Off	243	8.1211	97	8.2575	340	6.0969
16	1164	1.0000	202	6.3713	32	9.6327

Table 44 (Cont'd). MU Values for Windward Exposure from 5-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 5.7 < n < 8.8 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 8.8 < n < 11.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed n > 11.1 m/s	Normalized, 10 - 1
1	202	4.0782	20	6.6038	0	10.0000
2	162	5.2508	32	4.5660	11	7.5250
3	162	5.2508	32	4.5660	11	7.5250
4	0	10.0000	0	10.0000	0	10.0000
5	0	10.0000	0	10.0000	0	10.0000
6	32	9.0619	0	10.0000	0	10.0000
7	0	10.0000	0	10.0000	0	10.0000
1A	202	4.0782	20	6.6038	0	10.0000
1-Off	307	1.0000	53	1.0000	40	1.0000
2-Off	307	1.0000	53	1.0000	40	1.0000
3-Off	307	1.0000	53	1.0000	40	1.0000
16	0	10.0000	0	10.0000	0	10.0000

Table 46. MU Values for Windward Exposure from 6-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 0.5 < *n* < 2.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 2.1 < *n* < 3.6 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 3.6 < *n* < 5.7 m/s	Normalized, 10 - 1
1	1148	5.3185	162	7.9022	107	8.8893
2	614	7.4961	291	6.2317	323	6.6471
3	445	8.1853	243	6.8532	437	5.4637
4	0	10.0000	0	10.0000	0	10.0000
5	0	10.0000	0	10.0000	0	10.0000
6	1148	5.3185	162	7.9022	107	8.8893
7	614	7.4961	291	6.2317	323	6.6471
1A	1148	5.3185	162	7.9022	107	8.8893
1-Off	2207	1.0000	695	1.0000	867	1.0000
2-Off	323	8.6828	129	8.3295	299	6.8962
3-Off	356	8.5483	283	6.3353	340	6.4706
16	1164	5.2533	202	7.3842	32	9.6678

Table 45 (Cont'd). MU Values for Windward Exposure from 6-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 5.7 < *n* < 8.8 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 8.8 < *n* < 11.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed *n* > 11.1 m/s	Normalized, 10 - 1
1	18	9.0000	0	10.0000	0	10.0000
2	32	8.2222	0	10.0000	0	10.0000
3	40	7.7778	0	10.0000	0	10.0000
4	0	10.0000	0	10.0000	0	10.0000
5	0	10.0000	0	10.0000	0	10.0000
6	18	9.0000	0	10.0000	0	10.0000
7	32	8.2222	0	10.0000	0	10.0000
1A	18	9.0000	0	10.0000	0	10.0000
1-Off	91	4.9444	0	10.0000	0	10.0000
2-Off	162	1.0000	40	1.0000	13	1.0000
3-Off	162	1.0000	32	2.8000	11	2.3846
16	0	10.0000	0	10.0000	0	10.0000

Table 47. MU Values for Windward Exposure from 4-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 0.5 < *n* < 2.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 2.1 < *n* < 3.6 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 3.6 < *n* < 5.7 m/s	Normalized, 10 - 1
1	340	7.3711	20	9.6629	20	9.7775
2	340	7.3711	20	9.6629	20	9.7775
3	825	3.6211	129	7.8258	24	9.7330
4	1164	1.0000	202	6.5955	32	9.6440
5	825	3.6211	129	7.8258	24	9.7330
6	0	10.0000	0	10.0000	0	10.0000
7	825	3.6211	129	7.8258	24	9.7330
1A	340	7.3711	20	9.6629	20	9.7775
1-Off	215	8.3376	251	5.7697	485	4.6044
2-Off	215	8.3376	283	5.2303	323	6.4067
3-Off	430	6.6753	534	1.0000	809	1.0000
16	0	10.0000	0	10.0000	0	10.0000

Table 46 (Cont'd). MU Values for Windward Exposure from 4-Off per Wind Speed Category.

Loc. ID	Interpreted Number of Hours at Wind Speed 5.7 < *n* < 8.8 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed 8.8 < *n* < 11.1 m/s	Normalized, 10 - 1	Interpreted Number of Hours at Wind Speed *n* > 11.1 m/s	Normalized, 10 - 1
1	0	10.0000	0	10.0000	0	10.0000
2	0	10.0000	0	10.0000	0	10.0000
3	0	10.0000	0	10.0000	0	10.0000
4	0	10.0000	0	10.0000	0	10.0000
5	0	10.0000	0	10.0000	0	10.0000
6	0	10.0000	0	10.0000	0	10.0000
7	0	10.0000	0	10.0000	0	10.0000
1A	0	10.0000	0	10.0000	0	10.0000
1-Off	275	3.6211	32	3.6000	13	5.5000
2-Off	113	7.3789	13	7.4000	13	5.5000
3-Off	388	1.0000	45	1.0000	26	1.0000
16	0	10.0000	0	10.0000	0	10.0000

The next step in the MAUT process is to weight each of the decision attributes. As before, while there are certainly a number of ways to solicit these values, they have been directly assigned by this author for the needs of this dissertation. As shown in Table 48, a simple numerical scale from 1 to 10 has been used, with 1 being the lightest and 10 being the heaviest. Table 48 presents both raw weights along and with the corresponding normalized weight (normalization constraint applied, *see* Eq. (**3**) associated with each criterion.

Table 48. Assigned Weighting Factors.

Criteria	Assigned Weighting Value (1 – 10)	Normalized Weight (Eq. (3 Applied)
Meas. $C_{Rn\text{-}222}$	1	0.0098
Distance from LTP	10	0.0980
Distance from 5-Off	2	0.0196
Distance from 6-Off	2	0.0196
Distance form 4-Off	1	0.0098
Elevation	10	0.0980
Windward Exposure, LTP		
$0.5 < n < 2.1$ m/s	7	0.0686
$2.1 < n < 3.6$ m/s	4	0.0392
$3.6 < n < 5.7$ m/s	3	0.0294
$5.7 < n < 8.8$ m/s	2	0.0196
$8.8 < n < 11.1$ m/s	1	0.0098
$n > 11.1$ m/s	1	0.0098
Windward Exposure, 5-Off		
$0.5 < n < 2.1$ m/s	8	0.0784
$2.1 < n < 3.6$ m/s	4	0.0392
$3.6 < n < 5.7$ m/s	3	0.0294
$5.7 < n < 8.8$ m/s	2	0.0196
$8.8 < n < 11.1$ m/s	1	0.0098
$n > 11.1$ m/s	1	0.0098

Table 47 (Cont'd). Assigned Weighting Factors.

Criteria	Assigned Weighting Value (1 – 10)	Normalized Weight (Eq. (3 Applied)
Windward Exposure, 6-Off		
0.5 < *n* < 2.1 m/s	8	0.0784
2.1 < *n* < 3.6 m/s	4	0.0392
3.6 < *n* < 5.7 m/s	3	0.0294
5.7 < *n* < 8.8 m/s	2	0.0196
8.8 < *n* < 11.1 m/s	1	0.0098
***n* > 11.1 m/s**	1	0.0098
Windward Exposure, 4-Off		
0.5 < *n* < 2.1 m/s	9	0.0882
2.1 < *n* < 3.6 m/s	4	0.0392
3.6 < *n* < 5.7 m/s	3	0.0294
5.7 < *n* < 8.8 m/s	2	0.0196
8.8 < *n* < 11.1 m/s	1	0.0098
***n* > 11.1 m/s**	1	0.0098

Finally, using the simple additive technique, the utility values associated with each decision attribute for each alternative are multiplied by their respective normalized weighting factors and then summed to provide an aggregated utility value for each alternative. The MU factor along with its corresponding weighted marginal utility (WMU) value for each attribute for each alternative is shown in Table 49, which spans the next few pages. For convenience, a summary comparison of all the WMUs is presented in Table 50.

Table 49. Specimen: Analysis via MAUT: Aggregated Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 1		Loc. 2		Loc. 3	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0098	1.3707	**0.0134**	1.1667	**0.0114**	1.5341	**0.0150**
Distance from LTP	0.0980	1.0057	**0.0986**	1.9028	**0.1865**	1.9190	**0.1881**
Distance from 5-Off	0.0196	4.6027	**0.0902**	6.1099	**0.1198**	8.0278	**0.1573**
Distance from 6-Off	0.0196	5.4160	**0.1062**	5.1406	**0.1008**	6.7575	**0.1324**
Distance form 4-Off	0.0098	6.6796	**0.0655**	4.9670	**0.0487**	4.6132	**0.0452**
Elevation	0.0980	1.8514	**0.1814**	1.6976	**0.1664**	3.4286	**0.3360**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0686	8.1428	**0.5586**	9.3046	**0.6383**	8.0083	**0.5494**
2.1 < *n* < 3.6 m/s	0.0392	2.3346	**0.0915**	9.1066	**0.3570**	5.2794	**0.2070**
3.6 < *n* < 5.7 m/s	0.0294	1.0000	**0.0294**	6.9111	**0.2032**	2.5209	**0.0741**
5.7 < *n* < 8.8 m/s	0.0196	1.0000	**0.0196**	4.1053	**0.0805**	1.3298	**0.0261**
8.8 < *n* < 11.1 m/s	0.0098	2.2761	**0.0223**	1.0000	**0.0098**	1.5373	**0.0151**
***n* > 11.1 m/s**	0.0098	3.4286	**0.0336**	1.0000	**0.0098**	5.3571	**0.0525**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0784	3.9072	**0.3063**	7.2474	**0.5682**	7.2474	**0.5682**
2.1 < *n* < 3.6 m/s	0.0392	1.0000	**0.0392**	4.9162	**0.1927**	4.9162	**0.1927**
3.6 < *n* < 5.7 m/s	0.0294	1.0000	**0.0294**	6.0969	**0.1792**	6.0969	**0.1792**
5.7 < *n* < 8.8 m/s	0.0196	4.0782	**0.0799**	5.2508	**0.1029**	5.2508	**0.1029**
8.8 < *n* < 11.1 m/s	0.0098	6.6038	**0.0647**	4.5660	**0.0447**	4.5660	**0.0447**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	7.5250	**0.0737**	7.5250	**0.0737**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0784	5.3185	**0.4170**	7.4961	**0.5877**	8.1853	**0.6417**
2.1 < *n* < 3.6 m/s	0.0392	7.9022	**0.3098**	6.2317	**0.2443**	6.8532	**0.2686**
3.6 < *n* < 5.7 m/s	0.0294	8.8893	**0.2613**	6.6471	**0.1954**	5.4637	**0.1606**
5.7 < *n* < 8.8 m/s	0.0196	9.0000	**0.1764**	8.2222	**0.1612**	7.7778	**0.1524**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.0882	7.3711	**0.6501**	7.3711	**0.6501**	3.6211	**0.3194**
2.1 < *n* < 3.6 m/s	0.0392	9.6629	**0.3788**	9.6629	**0.3788**	7.8258	**0.3068**
3.6 < *n* < 5.7 m/s	0.0294	9.7775	**0.2875**	9.7775	**0.2875**	9.7330	**0.2862**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	10.0000	**0.1960**	10.0000	**0.1960**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Aggregated Utility Score		-	**4.9967**	-	**6.1865**	-	**5.6835**

Table 48 (Cont'd). Specimen: Analysis via MAUT: Aggregated Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 4		Loc. 5		Loc. 6	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0098	1.1078	**0.0109**	1.2373	**0.0121**	1.6256	**0.0159**
Distance from LTP	0.0980	2.4161	**0.2368**	1.0000	**0.0980**	1.7342	**0.1700**
Distance from 5-Off	0.0196	9.6630	**0.1894**	8.1455	**0.1597**	6.3883	**0.1252**
Distance from 6-Off	0.0196	10.0000	**0.1960**	8.9350	**0.1751**	8.5381	**0.1673**
Distance form 4-Off	0.0098	6.4887	**0.0636**	7.8420	**0.0769**	8.8056	**0.0863**
Elevation	0.0980	1.2515	**0.1226**	1.3076	**0.1281**	1.3534	**0.1326**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0686	7.6162	**0.5225**	1.0000	**0.0686**	8.2859	**0.5684**
2.1 < *n* < 3.6 m/s	0.0392	5.0037	**0.1961**	1.0000	**0.0392**	9.4706	**0.3712**
3.6 < *n* < 5.7 m/s	0.0294	4.2300	**0.1244**	3.1402	**0.0923**	10.0000	**0.2940**
5.7 < *n* < 8.8 m/s	0.0196	8.9969	**0.1763**	8.7496	**0.1715**	10.0000	**0.1960**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0584	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0784	10.0000	**0.7840**	10.0000	**0.7840**	5.2526	**0.4118**
2.1 < *n* < 3.6 m/s	0.0392	10.0000	**0.3920**	10.0000	**0.3920**	4.7725	**0.1871**
3.6 < *n* < 5.7 m/s	0.0294	10.0000	**0.2940**	10.0000	**0.2940**	6.2921	**0.1850**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	10.0000	**0.1960**	9.0619	**0.1776**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0784	10.0000	**0.7840**	10.0000	**0.7840**	5.3185	**0.4170**
2.1 < *n* < 3.6 m/s	0.0392	10.0000	**0.3920**	10.0000	**0.3920**	7.9022	**0.3098**
3.6 < *n* < 5.7 m/s	0.0294	10.0000	**0.2940**	10.0000	**0.2940**	8.8893	**0.2613**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	10.0000	**0.1960**	9.0000	**0.1764**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.0882	1.0000	**0.0882**	3.6211	**0.3194**	10.0000	**0.8820**
2.1 < *n* < 3.6 m/s	0.0392	6.5955	**0.2585**	7.8258	**0.3068**	10.0000	**0.3920**
3.6 < *n* < 5.7 m/s	0.0294	9.6440	**0.2835**	9.7330	**0.2862**	10.0000	**0.2940**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	10.0000	**0.1960**	10.0000	**0.1960**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Aggregated Utility Score		-	**6.7809**	-	**6.2458**	-	**6.8010**

Table 48 (Cont'd). Specimen: Analysis via MAUT: Aggregated Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 7		Loc. 1A		Loc. 1-Off	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0098	2.3802	**0.0233**	10.0000	**0.0980**	1.2373	**0.0121**
Distance from LTP	0.0980	1.5254	**0.1495**	2.5952	**0.2543**	7.0609	**0.6920**
Distance from 5-Off	0.0196	9.0229	**0.1768**	3.3056	**0.0648**	4.5272	**0.0887**
Distance from 6-Off	0.0196	8.3780	**0.1642**	4.4731	**0.0877**	1.0000	**0.0196**
Distance form 4-Off	0.0098	5.7730	**0.0566**	6.8946	**0.0676**	5.0335	**0.0493**
Elevation	0.0980	1.4400	**0.1411**	2.4000	**0.2352**	10.0000	**0.9800**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0686	8.3917	**0.5757**	8.8382	**0.6063**	9.3733	**0.6430**
2.1 < *n* < 3.6 m/s	0.0392	5.3676	**0.2104**	3.2279	**0.1265**	8.2132	**0.3220**
3.6 < *n* < 5.7 m/s	0.0294	4.0418	**0.1188**	2.5836	**0.0760**	7.3345	**0.2156**
5.7 < *n* < 8.8 m/s	0.0196	7.2244	**0.1416**	3.5557	**0.0697**	6.3313	**0.1241**
8.8 < *n* < 11.1 m/s	0.0098	8.6567	**0.0848**	5.9030	**0.0578**	5.2985	**0.0519**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	7.2143	**0.0707**	5.2857	**0.0518**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0784	10.0000	**0.7840**	3.9072	**0.3063**	8.1211	**0.6367**
2.1 < *n* < 3.6 m/s	0.0392	10.0000	**0.3920**	1.0000	**0.0392**	8.2575	**0.3237**
3.6 < *n* < 5.7 m/s	0.0294	10.0000	**0.2940**	1.0000	**0.0294**	6.0969	**0.1792**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	4.0782	**0.0799**	1.0000	**0.0196**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	6.6038	**0.0647**	1.0000	**0.0098**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	1.0000	**0.0098**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0784	7.4961	**0.5877**	5.3185	**0.4170**	1.0000	**0.0784**
2.1 < *n* < 3.6 m/s	0.0392	6.2317	**0.2443**	7.9022	**0.3098**	1.0000	**0.0392**
3.6 < *n* < 5.7 m/s	0.0294	6.6471	**0.1954**	8.8893	**0.2613**	1.0000	**0.0294**
5.7 < *n* < 8.8 m/s	0.0196	8.2222	**0.1612**	9.0000	**0.1764**	4.9444	**0.0969**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	10.0000	**0.0980**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.0882	3.6211	**0.3194**	7.3711	**0.6501**	8.3376	**0.7354**
2.1 < *n* < 3.6 m/s	0.0392	7.8258	**0.3068**	9.6629	**0.3788**	5.7697	**0.2262**
3.6 < *n* < 5.7 m/s	0.0294	9.7330	**0.2862**	9.7775	**0.2875**	4.6044	**0.1354**
5.7 < *n* < 8.8 m/s	0.0196	10.0000	**0.1960**	10.0000	**0.1960**	3.6211	**0.0710**
8.8 < *n* < 11.1 m/s	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	3.6000	**0.0353**
***n* > 11.1 m/s**	0.0098	10.0000	**0.0980**	10.0000	**0.0980**	5.5000	**0.0539**
Aggregated Utility Score		-	**6.4918**	-	**5.5010**	-	**6.1260**

Table 48 (Cont'd). Specimen: Analysis via MAUT: Aggregated Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 2-Off		Loc. 3-Off		Loc. 16	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0098	1.0559	**0.0103**	1.0000	**0.0098**	1.1965	**0.0117**
Distance from LTP	0.0980	8.6165	**0.8444**	10.0000	**0.9800**	7.0687	**0.6927**
Distance from 5-Off	0.0196	6.5640	**0.1287**	10.0000	**0.1960**	1.0000	**0.0196**
Distance from 6-Off	0.0196	1.6342	**0.0320**	4.8168	**0.0944**	5.6153	**0.1101**
Distance form 4-Off	0.0098	3.7596	**0.0368**	1.0000	**0.0098**	10.0000	**0.0980**
Elevation	0.0980	2.4727	**0.2423**	1.0000	**0.0980**	1.0033	**0.0983**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	0.0686	9.3046	**0.6383**	10.0000	**0.6860**	9.2903	**0.6373**
$2.1 < n < 3.6$ m/s	0.0392	9.1066	**0.3570**	10.0000	**0.3920**	7.5404	**0.2956**
$3.6 < n < 5.7$ m/s	0.0294	6.9111	**0.2032**	8.4948	**0.2497**	5.1159	**0.1504**
$5.7 < n < 8.8$ m/s	0.0196	4.1053	**0.0805**	6.6611	**0.1306**	4.8885	**0.0958**
$8.8 < n < 11.1$ m/s	0.0098	1.0000	**0.0098**	4.5597	**0.0447**	6.7090	**0.0657**
$n > 11.1$ m/s	0.0098	1.0000	**0.0098**	4.7857	**0.0469**	9.0714	**0.0889**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0784	8.1211	**0.6367**	8.1211	**0.6367**	1.0000	**0.0784**
$2.1 < n < 3.6$ m/s	0.0392	8.2575	**0.3237**	8.2575	**0.3237**	6.3713	**0.2498**
$3.6 < n < 5.7$ m/s	0.0294	6.0969	**0.1792**	6.0969	**0.1792**	9.6327	**0.2832**
$5.7 < n < 8.8$ m/s	0.0196	1.0000	**0.0196**	1.0000	**0.0196**	10.0000	**0.1960**
$8.8 < n < 11.1$ m/s	0.0098	1.0000	**0.0098**	1.0000	**0.0098**	10.0000	**0.0980**
$n > 11.1$ m/s	0.0098	1.0000	**0.0098**	1.0000	**0.0098**	10.0000	**0.0980**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0784	8.6828	**0.6807**	8.5483	**0.6702**	5.2533	**0.4119**
$2.1 < n < 3.6$ m/s	0.0392	8.3295	**0.3265**	6.3353	**0.2483**	7.3842	**0.2895**
$3.6 < n < 5.7$ m/s	0.0294	6.8962	**0.2027**	6.4706	**0.1902**	9.6678	**0.2842**
$5.7 < n < 8.8$ m/s	0.0196	1.0000	**0.0196**	1.0000	**0.0196**	10.0000	**0.1960**
$8.8 < n < 11.1$ m/s	0.0098	1.0000	**0.0098**	2.8000	**0.0274**	10.0000	**0.0980**
$n > 11.1$ m/s	0.0098	1.0000	**0.0098**	2.3846	**0.0234**	10.0000	**0.0980**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.0882	8.3376	**0.7354**	6.6753	**0.5888**	10.0000	**0.8820**
$2.1 < n < 3.6$ m/s	0.0392	5.2303	**0.2050**	1.0000	**0.0392**	10.0000	**0.3920**
$3.6 < n < 5.7$ m/s	0.0294	6.4067	**0.1884**	1.0000	**0.0294**	10.0000	**0.2940**
$5.7 < n < 8.8$ m/s	0.0196	7.3789	**0.1446**	1.0000	**0.0196**	10.0000	**0.1960**
$8.8 < n < 11.1$ m/s	0.0098	7.4000	**0.0725**	1.0000	**0.0098**	10.0000	**0.0980**
$n > 11.1$ m/s	0.0098	5.5000	**0.0539**	1.0000	**0.0098**	10.0000	**0.0980**
Aggregated Utility Score		-	6.4210	-	5.9925	-	6.7051

Table 50. Specimen: Analysis via MAUT: Summary of Aggregated Weighted Marginal Utility Scores for Each Alternative.

Decision Problem Alternative	Aggregated Weighted Utility Score
Location 1	4.9967
Location 2	6.1865
Location 3	5.6835
Location 4	6.7809
Location 5	6.2458
Location 6	**6.8010**
Location 7	6.4918
Location 1A	5.5010
Location 1-Off	6.1260
Location 2-Off	6.4210
Location 3-Off	5.9925
Location 16	6.7051

As indicated in the summary provided in Table 50 above, the MAUT analysis exercise has shown Location 6 to be the decision problem alternative with the greatest utility. That is, according to preferences and weighting factors used, Location 6 represents the most rational choice to designate as the geographically appropriate location indicative of the relative natural background value for radon in air.

As a follow-up measure to any MAUT analysis, a sensitivity analysis is generally performed. For the needs of this dissertation, each MAUT and AHP analysis will be accompanied by thirteen what-if scenarios, which are described as follows:

- The effects on the outcome from setting all criteria weighting factors (and local PV weights, in the case of AHP model runs) equal to one another.

- The effects on the outcome of manipulating all wind-related criteria weighting factors and local PV weights first by reducing them 10 percent, then reducing them by 20 percent, and finally reducing them by 50 percent.
- The effects on the outcome of manipulating all distance-related criteria weighting factors and local PV weights first by reducing them 10 percent, then reducing them by 20 percent, and finally reducing them by 50 percent.
- The effects on the outcome of manipulating the elevation criterion weighting factor and local PV weight first by reducing it 10 percent, then reducing it by 20 percent, and finally reducing it by 50 percent.
- The effects on the outcome of manipulating the Measured $\boldsymbol{C}_{\text{Rn-222}}$ criterion weighting factor and local PV weight first by reducing it 10 percent, then reducing it by 20 percent, and finally reducing it by 50 percent.

The results of the sensitivity analysis for the initial MAUT analysis are provided in Table 51.

Table 51. Sensitivity Analysis for Initial MAUT Model Run.

Criteria	As-Is: What Changed? Nothing. Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score	What-If Scenario I: What Changed? *All Criteria Weighting Factors Equalized.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score
$C_{Rn\text{-}222}$	0.0098	1st	Loc. 6	6.8010	0.0333	1st	Loc. 4	8.1338
Distance, LTP	0.0980	2nd	Loc. 4	6.7809	0.0333	2nd	Loc. 6	8.0897
Distance, 5-Off	0.0196	3rd	Loc. 16	6.7051	0.0333	3rd	Loc. 5	7.7846
Distance, 6-Off	0.0196	4th	Loc. 7	6.4918	0.0333	4th	Loc. 7	7.7326
Distance, 4-Off	0.0098	5th	Loc. 2-Off	6.4210	0.0333	5th	Loc. 16	7.5936
Elevation	0.0980	6th	Loc. 5	6.2458	0.0333	6th	Loc. 1A	6.5167
W.E., LTP, *n*-Cat I	0.0686	7th	Loc. 2	6.1865	0.0333	7th	Loc. 2	6.4474
W.E., LTP, *n*-Cat II	0.0392	8th	Loc. 1-Off	6.1260	0.0333	8th	Loc. 3	6.1792
W.E., LTP, *n*-Cat III	0.0294	9th	Loc. 3-Off	5.9925	0.0333	9th	Loc. 1	5.7873
W.E., LTP, *n*-Cat IV	0.0196	10th	Loc. 3	5.6835	0.0333	10th	Loc. 1-Off	5.1849
W.E., LTP, *n*-Cat V	0.0098	11th	Loc. 1A	5.5010	0.0333	11th	Loc. 2-Off	4.9389
W.E., LTP, *n*-Cat VI	0.0098	12th	Loc. 1	4.9967	0.0333	12th	Loc. 3-Off	4.5669
W.E., 5-Off, *n*-Cat I	0.0784				0.0333			
W.E., 5-Off, *n*-Cat II	0.0392				0.0333			
W.E., 5-Off, *n*-Cat III	0.0294				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0196				0.0333			
W.E., 5-Off, *n*-Cat V	0.0098				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0098				0.0333			
W.E., 6-Off, *n*-Cat I	0.0784				0.0333			
W.E., 6-Off, *n*-Cat II	0.0392				0.0333			
W.E., 6-Off, *n*-Cat III	0.0294				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0196				0.0333			
W.E., 6-Off, *n*-Cat V	0.0098				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0098				0.0333			
W.E., 4-Off, *n*-Cat I	0.0882				0.0333			
W.E., 4-Off, *n*-Cat II	0.0392				0.0333			
W.E., 4-Off, *n*-Cat III	0.0294				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0196				0.0333			
W.E., 4-Off, *n*-Cat V	0.0098				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0098				0.0333			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

	What-If Scenario II				What-If Scenario III			
	What Changed? *All Wind-Related Weighting Factors Reduced 10% from Original "As-Is" Values.*				What Changed? *All Wind-Related Weighting Factors Reduced 20% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0106	1st	Loc. 6	6.6917	0.0115	1st	Loc. 4	6.5698
Distance, LTP	0.1059	2nd	Loc. 4	6.6853	0.1152	2nd	Loc. 6	6.5601
Distance, 5-Off	0.0212	3rd	Loc. 16	6.6344	0.0230	3rd	Loc. 16	6.5482
Distance, 6-Off	0.0212	4th	Loc. 7	6.3924	0.0230	4th	Loc. 2-Off	6.3431
Distance, 4-Off	0.0106	5th	Loc. 2-Off	6.3866	0.0115	5th	Loc. 7	6.2726
Elevation	0.1059	6th	Loc. 1-Off	6.1587	0.1152	6th	Loc. 1-Off	6.1943
W.E., LTP, *n*-Cat I	0.0667	7th	Loc. 5	6.1465	0.0645	7th	Loc. 5	6.0268
W.E., LTP, *n*-Cat II	0.0381	8th	Loc. 2	6.0870	0.0369	8th	Loc. 2	5.9671
W.E., LTP, *n*-Cat III	0.0286	9th	Loc. 3-Off	5.9798	0.0276	9th	Loc. 3-Off	5.9621
W.E., LTP, *n*-Cat IV	0.0191	10th	Loc. 3	5.6236	0.0184	10th	Loc. 3	5.5507
W.E., LTP, *n*-Cat V	0.0095	11th	Loc. 1A	5.4389	0.0092	11th	Loc. 1A	5.3634
W.E., LTP, *n*-Cat VI	0.0095	12th	Loc. 1	4.9210	0.0092	12th	Loc. 1	4.8298
W.E., 5-Off, *n*-Cat I	0.0763				0.0737			
W.E., 5-Off, *n*-Cat II	0.0381				0.0369			
W.E., 5-Off, *n*-Cat III	0.0286				0.0276			
W.E., 5-Off, *n*-Cat IV	0.0191				0.0184			
W.E., 5-Off, *n*-Cat V	0.0095				0.0092			
W.E., 5-Off, *n*-Cat VI	0.0095				0.0092			
W.E., 6-Off, *n*-Cat I	0.0763				0.0737			
W.E., 6-Off, *n*-Cat II	0.0381				0.0369			
W.E., 6-Off, *n*-Cat III	0.0286				0.0276			
W.E., 6-Off, *n*-Cat IV	0.0191				0.0184			
W.E., 6-Off, *n*-Cat V	0.0095				0.0092			
W.E., 6-Off, *n*-Cat VI	0.0095				0.0092			
W.E., 4-Off, *n*-Cat I	0.0858				0.0829			
W.E., 4-Off, *n*-Cat II	0.0381				0.0369			
W.E., 4-Off, *n*-Cat III	0.0286				0.0276			
W.E., 4-Off, *n*-Cat IV	0.0191				0.0184			
W.E., 4-Off, *n*-Cat V	0.0095				0.0092			
W.E., 4-Off, *n*-Cat VI	0.0095				0.0092			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

	What-If Scenario IV				What-If Scenario V			
	What Changed? *All Wind-Related Weighting Factors Reduced 50% from Original "As-Is" Values.*				What Changed? *All Distance-Related Weighting Factors Reduced 10% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	Criteria Weighting Factor	Rank	Alternative	Aggregated Weighted Utility Score	Criteria Weighting Factor	Rank	Alternative	Aggregated Weighted Utility Score
$C_{Rn\text{-}222}$	0.0156	1st	Loc. 1-Off	6.3518	0.0100	1st	Loc. 6	6.8495
Distance, LTP	0.1563	2nd	Loc. 16	6.1667	0.0896	2nd	Loc. 4	6.8152
Distance, 5-Off	0.0313	3rd	Loc. 2-Off	6.1508	0.0179	3rd	Loc. 16	6.7145
Distance, 6-Off	0.0313	4th	Loc. 4	6.0588	0.0179	4th	Loc. 7	6.5357
Distance, 4-Off	0.0156	5th	Loc. 6	5.9777	0.0090	5th	Loc. 2-Off	6.4136
Elevation	0.1563	6th	Loc. 3-Off	5.8837	0.0995	6th	Loc. 5	6.2898
W.E., LTP, *n*-Cat I	0.0547	7th	Loc. 7	5.7425	0.0697	7th	Loc. 2	6.2351
W.E., LTP, *n*-Cat II	0.0313	8th	Loc. 5	5.4972	0.0398	8th	Loc. 1-Off	6.1336
W.E., LTP, *n*-Cat III	0.0234	9th	Loc. 2	5.4368	0.0299	9th	Loc. 3-Off	5.9544
W.E., LTP, *n*-Cat IV	0.0156	10th	Loc. 3	5.2277	0.0199	10th	Loc. 3	5.7175
W.E., LTP, *n*-Cat V	0.0078	11th	Loc. 1A	5.0292	0.0100	11th	Loc. 1A	5.5372
W.E., LTP, *n*-Cat VI	0.0078	12th	Loc. 1	4.4260	0.0100	12th	Loc. 1	5.0367
W.E., 5-Off, *n*-Cat I	0.0625				0.0796			
W.E., 5-Off, *n*-Cat II	0.0313				0.0398			
W.E., 5-Off, *n*-Cat III	0.0234				0.0299			
W.E., 5-Off, *n*-Cat IV	0.0156				0.0199			
W.E., 5-Off, *n*-Cat V	0.0078				0.0100			
W.E., 5-Off, *n*-Cat VI	0.0078				0.0100			
W.E., 6-Off, *n*-Cat I	0.0625				0.0796			
W.E., 6-Off, *n*-Cat II	0.0313				0.0398			
W.E., 6-Off, *n*-Cat III	0.0234				0.0299			
W.E., 6-Off, *n*-Cat IV	0.0156				0.0199			
W.E., 6-Off, *n*-Cat V	0.0078				0.0100			
W.E., 6-Off, *n*-Cat VI	0.0078				0.0100			
W.E., 4-Off, *n*-Cat I	0.0703				0.0896			
W.E., 4-Off, *n*-Cat II	0.0313				0.0398			
W.E., 4-Off, *n*-Cat III	0.0234				0.0299			
W.E., 4-Off, *n*-Cat IV	0.0156				0.0199			
W.E., 4-Off, *n*-Cat V	0.0078				0.0100			
W.E., 4-Off, *n*-Cat VI	0.0078				0.0100			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

	What-If Scenario VI — What Changed? ***All Distance-Related Weighting Factors Reduced 20% from Original "As-Is" Values.***				**What-If Scenario VII** — What Changed? ***All Distance-Related Weighting Factors Reduced 50% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0101	1st	Loc. 6	6.8968	0.0106	1st	Loc. 6	7.0474
Distance, LTP	0.0808	2nd	Loc. 4	6.8478	0.0529	2nd	Loc. 4	6.9517
Distance, 5-Off	0.0162	3rd	Loc. 16	6.7213	0.0106	3rd	Loc. 16	6.7432
Distance, 6-Off	0.0162	4th	Loc. 7	6.5784	0.0106	4th	Loc. 7	6.7144
Distance, 4-Off	0.0081	5th	Loc. 2-Off	6.4034	0.0053	5th	Loc. 5	6.4691
Elevation	0.1010	6th	Loc. 5	6.3326	0.1058	6th	Loc. 2	6.4341
W.E., LTP, *n*-Cat I	0.0707	7th	Loc. 2	6.2826	0.0741	7th	Loc. 2-Off	6.3708
W.E., LTP, *n*-Cat II	0.0404	8th	Loc. 1-Off	6.1390	0.0423	8th	Loc. 1-Off	6.1561
W.E., LTP, *n*-Cat III	0.0303	9th	Loc. 3-Off	5.9126	0.0317	9th	Loc. 3	5.8546
W.E., LTP, *n*-Cat IV	0.0202	10th	Loc. 3	5.7502	0.0212	10th	Loc. 3-Off	5.7795
W.E., LTP, *n*-Cat V	0.0101	11th	Loc. 1A	5.5722	0.0106	11th	Loc. 1A	5.6839
W.E., LTP, *n*-Cat VI	0.0101	12th	Loc. 1	5.0759	0.0106	12th	Loc. 1	5.2009
W.E., 5-Off, *n*-Cat I	0.0808				0.0847			
W.E., 5-Off, *n*-Cat II	0.0404				0.0423			
W.E., 5-Off, *n*-Cat III	0.0303				0.0317			
W.E., 5-Off, *n*-Cat IV	0.0202				0.0212			
W.E., 5-Off, *n*-Cat V	0.0101				0.0106			
W.E., 5-Off, *n*-Cat VI	0.0101				0.0106			
W.E., 6-Off, *n*-Cat I	0.0808				0.0847			
W.E., 6-Off, *n*-Cat II	0.0404				0.0423			
W.E., 6-Off, *n*-Cat III	0.0303				0.0317			
W.E., 6-Off, *n*-Cat IV	0.0202				0.0212			
W.E., 6-Off, *n*-Cat V	0.0101				0.0106			
W.E., 6-Off, *n*-Cat VI	0.0101				0.0106			
W.E., 4-Off, *n*-Cat I	0.0909				0.0952			
W.E., 4-Off, *n*-Cat II	0.0404				0.0423			
W.E., 4-Off, *n*-Cat III	0.0303				0.0317			
W.E., 4-Off, *n*-Cat IV	0.0202				0.0212			
W.E., 4-Off, *n*-Cat V	0.0101				0.0106			
W.E., 4-Off, *n*-Cat VI	0.0101				0.0106			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? *Elevation Weighting Factor Reduced 10% from Original "As-Is" Value.*				**What Changed? *Elevation Weighting Factor Reduced 20% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0099	1st	Loc. 6	6.8577	0.0100	1st	Loc. 6	6.9127
Distance, LTP	0.0990	2nd	Loc. 4	6.8383	0.1000	2nd	Loc. 4	6.8942
Distance, 5-Off	0.0198	3rd	Loc. 16	6.7643	0.0200	3rd	Loc. 16	6.8219
Distance, 6-Off	0.0198	4th	Loc. 7	6.5444	0.0200	4th	Loc. 7	6.5955
Distance, 4-Off	0.0099	5th	Loc. 2-Off	6.4627	0.0100	5th	Loc. 2-Off	6.5026
Elevation	0.0891	6th	Loc. 5	6.2972	0.0800	6th	Loc. 5	6.3471
W.E., LTP, *n*-Cat I	0.0693	7th	Loc. 2	6.2334	0.0700	7th	Loc. 2	6.2788
W.E., LTP, *n*-Cat II	0.0396	8th	Loc. 1-Off	6.0901	0.0400	8th	Loc. 3-Off	6.0948
W.E., LTP, *n*-Cat III	0.0297	9th	Loc. 3-Off	6.0443	0.0300	9th	Loc. 1-Off	6.0510
W.E., LTP, *n*-Cat IV	0.0198	10th	Loc. 3	5.7081	0.0200	10th	Loc. 3	5.7309
W.E., LTP, *n*-Cat V	0.0099	11th	Loc. 1A	5.5340	0.0100	11th	Loc. 1A	5.5653
W.E., LTP, *n*-Cat VI	0.0099	12th	Loc. 1	5.0299	0.0100	12th	Loc. 1	5.0617
W.E., 5-Off, *n*-Cat I	0.0792				0.0800			
W.E., 5-Off, *n*-Cat II	0.0396				0.0400			
W.E., 5-Off, *n*-Cat III	0.0297				0.0300			
W.E., 5-Off, *n*-Cat IV	0.0198				0.0200			
W.E., 5-Off, *n*-Cat V	0.0099				0.0100			
W.E., 5-Off, *n*-Cat VI	0.0099				0.0100			
W.E., 6-Off, *n*-Cat I	0.0792				0.0800			
W.E., 6-Off, *n*-Cat II	0.0396				0.0400			
W.E., 6-Off, *n*-Cat III	0.0297				0.0300			
W.E., 6-Off, *n*-Cat IV	0.0198				0.0200			
W.E., 6-Off, *n*-Cat V	0.0099				0.0100			
W.E., 6-Off, *n*-Cat VI	0.0099				0.0100			
W.E., 4-Off, *n*-Cat I	0.0891				0.0900			
W.E., 4-Off, *n*-Cat II	0.0396				0.0400			
W.E., 4-Off, *n*-Cat III	0.0297				0.0300			
W.E., 4-Off, *n*-Cat IV	0.0198				0.0200			
W.E., 4-Off, *n*-Cat V	0.0099				0.0100			
W.E., 4-Off, *n*-Cat VI	0.0099				0.0100			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

	What-If Scenario X				**What-If Scenario XI**			
	What Changed? ***Elevation Weighting Factor Reduced 50% from Original "As-Is" Value.***				**What Changed?** ***Measured C_{Rn-222} Weighting Factor Reduced 10% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
C_{Rn-222}	0.0103	1st	Loc. 6	7.0847	0.0088	1st	Loc. 6	6.8088
Distance, LTP	0.1031	2nd	Loc. 4	7.0687	0.0981	2nd	Loc. 4	6.7891
Distance, 5-Off	0.0206	3rd	Loc. 16	7.0018	0.0196	3rd	Loc. 16	6.7132
Distance, 6-Off	0.0206	4th	Loc. 7	6.7549	0.0196	4th	Loc. 7	6.4984
Distance, 4-Off	0.0103	5th	Loc. 2-Off	6.6272	0.0098	5th	Loc. 2-Off	6.4288
Elevation	0.0515	6th	Loc. 5	6.5030	0.0981	6th	Loc. 5	6.2532
W.E., LTP, *n*-Cat I	0.0722	7th	Loc. 2	6.4205	0.0687	7th	Loc. 2	6.1939
W.E., LTP, *n*-Cat II	0.0412	8th	Loc. 3-Off	6.2523	0.0393	8th	Loc. 1-Off	6.1332
W.E., LTP, *n*-Cat III	0.0309	9th	Loc. 1-Off	5.9289	0.0294	9th	Loc. 3-Off	5.9998
W.E., LTP, *n*-Cat IV	0.0206	10th	Loc. 3	5.8021	0.0196	10th	Loc. 3	5.6898
W.E., LTP, *n*-Cat V	0.0103	11th	Loc. 1A	5.6632	0.0098	11th	Loc. 1A	5.4988
W.E., LTP, *n*-Cat VI	0.0103	12th	Loc. 1	5.1609	0.0098	12th	Loc. 1	5.0023
W.E., 5-Off, *n*-Cat I	0.0825				0.0785			
W.E., 5-Off, *n*-Cat II	0.0412				0.0393			
W.E., 5-Off, *n*-Cat III	0.0309				0.0294			
W.E., 5-Off, *n*-Cat IV	0.0206				0.0196			
W.E., 5-Off, *n*-Cat V	0.0103				0.0098			
W.E., 5-Off, *n*-Cat VI	0.0103				0.0098			
W.E., 6-Off, *n*-Cat I	0.0825				0.0785			
W.E., 6-Off, *n*-Cat II	0.0412				0.0393			
W.E., 6-Off, *n*-Cat III	0.0309				0.0294			
W.E., 6-Off, *n*-Cat IV	0.0206				0.0196			
W.E., 6-Off, *n*-Cat V	0.0103				0.0098			
W.E., 6-Off, *n*-Cat VI	0.0103				0.0098			
W.E., 4-Off, *n*-Cat I	0.0928				0.0883			
W.E., 4-Off, *n*-Cat II	0.0412				0.0393			
W.E., 4-Off, *n*-Cat III	0.0309				0.0294			
W.E., 4-Off, *n*-Cat IV	0.0206				0.0196			
W.E., 4-Off, *n*-Cat V	0.0103				0.0098			
W.E., 4-Off, *n*-Cat VI	0.0103				0.0098			

Table 50 (Cont'd). Sensitivity Analysis for Initial MAUT Model Run.

Criteria	What-If Scenario XII — What Changed? *Measured C_{Rn-222} Weighting Factor Reduced 20% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score	What-If Scenario XIII — What Changed? *Measured C_{Rn-222} Weighting Factor Reduced 50% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score
C_{Rn-222}	0.0079	1st	Loc. 6	6.8139	0.0049	1st	Loc. 6	6.8292
Distance, LTP	0.0982	2nd	Loc. 4	6.7947	0.0985	2nd	Loc. 4	6.8115
Distance, 5-Off	0.0196	3rd	Loc. 16	6.7186	0.0197	3rd	Loc. 16	6.7350
Distance, 6-Off	0.0196	4th	Loc. 7	6.5025	0.0197	4th	Loc. 7	6.5146
Distance, 4-Off	0.0098	5th	Loc. 2-Off	6.4341	0.0099	5th	Loc. 2-Off	6.4500
Elevation	0.0982	6th	Loc. 5	6.2582	0.0985	6th	Loc. 5	6.2730
W.E., LTP, *n*-Cat I	0.0688	7th	Loc. 2	6.1988	0.0690	7th	Loc. 2	6.2137
W.E., LTP, *n*-Cat II	0.0393	8th	Loc. 1-Off	6.1381	0.0394	8th	Loc. 1-Off	6.1525
W.E., LTP, *n*-Cat III	0.0295	9th	Loc. 3-Off	6.0047	0.0296	9th	Loc. 3-Off	6.0195
W.E., LTP, *n*-Cat IV	0.0196	10th	Loc. 3	5.6939	0.0197	10th	Loc. 3	5.7062
W.E., LTP, *n*-Cat V	0.0098	11th	Loc. 1A	5.4944	0.0099	11th	Loc. 1A	5.4811
W.E., LTP, *n*-Cat VI	0.0098	12th	Loc. 1	5.0058	0.0099	12th	Loc. 1	5.0166
W.E., 5-Off, *n*-Cat I	0.0786				0.0788			
W.E., 5-Off, *n*-Cat II	0.0393				0.0394			
W.E., 5-Off, *n*-Cat III	0.0295				0.0296			
W.E., 5-Off, *n*-Cat IV	0.0196				0.0197			
W.E., 5-Off, *n*-Cat V	0.0098				0.0099			
W.E., 5-Off, *n*-Cat VI	0.0098				0.0099			
W.E., 6-Off, *n*-Cat I	0.0786				0.0788			
W.E., 6-Off, *n*-Cat II	0.0393				0.0394			
W.E., 6-Off, *n*-Cat III	0.0295				0.0296			
W.E., 6-Off, *n*-Cat IV	0.0196				0.0197			
W.E., 6-Off, *n*-Cat V	0.0098				0.0099			
W.E., 6-Off, *n*-Cat VI	0.0098				0.0099			
W.E., 4-Off, *n*-Cat I	0.0884				0.0887			
W.E., 4-Off, *n*-Cat II	0.0393				0.0394			
W.E., 4-Off, *n*-Cat III	0.0295				0.0296			
W.E., 4-Off, *n*-Cat IV	0.0196				0.0197			
W.E., 4-Off, *n*-Cat V	0.0098				0.0099			
W.E., 4-Off, *n*-Cat VI	0.0098				0.0099			

Upon examination of the sensitivity analysis presented above, it can be seen that Location 6 is strongly weighted, taking the top-ranking position in all but three of the scenarios presented. It can also be seen that Locations 1 and 1A are the least preferred alternatives in every scenario, except for the one that forced equalized weighting factors.

As mentioned in , MAUT analyses are notoriously tedious, time-consuming, and require considerable amounts of effort and attention to detail. Next, the same decision problem is analyzed via a much less time-consuming method: AHP.

Analysis via AHP

As before with MAUT, a helpful but often unspoken first step in any AHP problem is to draw a picture of the decision-making process. Using the process illustrated in Figure 10 as a guide, the general arrangement for the particular decision problem at hand is illustrated below in Figure 21.

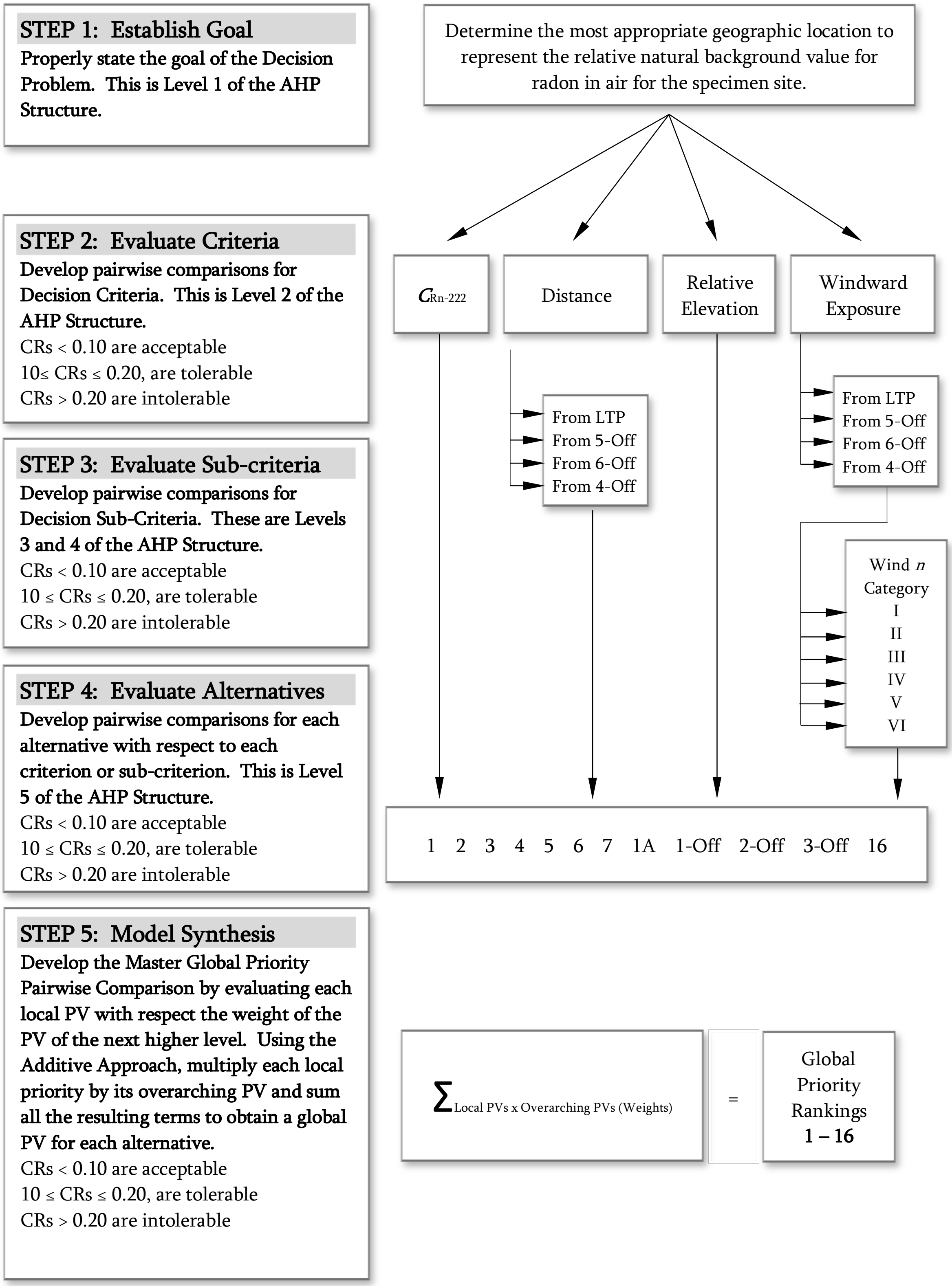

Figure 21. AHP Decision Model for Dissertation Problem Statement.

As illustrated in Figure 21, the first step in AHP is to define the goal of the decision problem. For the situation at hand, this is very easy—the goal of the decision problem is synonymous with the problem statement of this dissertation as it pertains to the specimen site, which has oft been repeated throughout this conversation. The next step in AHP is to define the criteria and sub-criteria. For the situation at hand, this is also very simple, the criteria at issue are the same four decision attributes (*see* Table 22) used in the MAUT analysis, namely:

1. The measured $\boldsymbol{C}_{\text{Rn-222}}$;
2. Distance [from an anthropogenic source];
3. Elevation; and
4. Windward Exposure.

In this case, the criterion associated with distance is broken up into four sub-criteria, with one sub-criterion dedicated to each of the four anthropogenic sources (*i.e.,* the LTP, 5-Off, 6-Off, and 4-Off). The criterion associated with windward exposure is broken up into four sub-criteria, with one sub-criterion dedicated to each of the four anthropogenic sources, and each one of those further broken up into six additional sub-criteria to delineate each wind speed category.

Still referring to Figure 21, the next step in AHP is to define the decision alternatives. These need to be consistent across the board (*i.e.,* each alternative needs to apply to each set up criteria, sub-criteria, and eventually roll up to the goal of the decision problem). For the situation at hand, the decision alternatives are the same 12 geographic locations used as alternatives in the MAUT process. Finally, once all the appropriate pairwise comparisons have been made, the process of model synthesis takes place. Model synthesis is the process by which global priority rankings are determined in AHP. This is done by taking the local PVs determined for each alternative and weighing them by the PVs of the next highest level and then adding the terms together to produce a single value. The alternative with the highest global priority represents the most rational choice.

As discussed in

CHAPTER 2, the central theme of AHP is to determine preferences, and this is done via pairwise comparisons. As with elicitation of the utility values and weighting factors used in a MAUT analysis, determining preferences in AHP can be done by individuals, small groups, large groups, via committee, via a selected groups of subject matter experts, or a combination of these, with checks and balances and/or other types of review steps incorporated along the way. As before, for the purposes of this research, preferences have been determined by this dissertation's author.

To facilitate the analysis of the particular decision problem at hand via AHP, a total of 34 pairwise comparisons are required at a minimum. Referring to Figure 21: there is one pairwise comparison required to evaluate the criteria to goal (Level 2 to 1); there are two pairwise comparisons required to evaluate the sub-criteria categories of Wind Speed and [Relative] Distance with respect to their overarching criteria categories of Windward Exposure and Distance, respectively; and finally, there are 31 pairwise comparisons that need to be made with respect to the alternatives—one for each overarching criteria or sub-criteria. A global priority score can then be determined by aggregating all the PVs for each alternative, with each one being multiplied by the respective PV (weight) of its overarching level. In light of the previous, the following tables are introduced:

- Tables Table ***52***, Table ***53*** and Table ***54*** pertain to the Goal Level relationships, and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***55***, Table ***56*** and Table ***57*** pertain to the Criteria Level relationships associated Distance from an Anthropogenic Source and present the pairwise

comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***58***, Table ***59*** and Table ***60*** pertain to the Criteria Level relationships associated Windward Exposure from an Anthropogenic Source and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***61***, Table ***62*** and Table ***63*** pertain to the Sub-Criteria relationships associated Wind Speed Categories and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***64***, Table ***65*** and Table ***66*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to measured $C_{Rn\text{-}222}$ and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***67***, Table ***68*** and Table ***69*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Distance from the LTP and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***70***, Table ***71*** and Table ***72*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Distance from 5-Off and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***73***, Table ***74*** and Table ***75*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Distance from 6-Off

and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***76***, Table ***77*** and Table ***78*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Distance from 4-Off and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***79***, Table ***80*** and Table ***81*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Elevation and present the pairwise comparison, the normalized pairwise comparison with calculated PVs and the CR check, respectively.
- Tables Table ***82***, Table ***83*** and Table ***84*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category I and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***85***, Table ***86*** and Table ***87*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category II and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***88***, Table ***89***, and Table ***90*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category III and present the pairwise

comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***91***, Table ***92*** and Table ***93*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category IV and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***94***, Table ***95*** and Table ***96*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category V and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***97***, Table ***98*** and Table ***99*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from the LTP as a function of Wind Speed for *n*-Category VI and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***100***, Table ***101*** and Table ***102*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category I and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***103***, Table **104** and Table ***105*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category II and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***106***, Table ***107*** and Table ***108*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category III and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***109***, Table ***110*** and Table ***111*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category IV and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***112***, Table ***113*** and Table ***114*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category V and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***115***, Table ***116*** and Table ***117*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category VI and present the

pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***118***, Table ***119*** and Table ***120*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category I and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***121***, Table ***122*** and Table ***123*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category II and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***124***, Table ***125*** and Table ***126*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category III and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***127***, Table ***128*** and Table ***129*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category IV and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***130***, Table ***131*** and Table ***132*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category V and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***133***, Table ***134*** and Table ***135*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category VI and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***136***, Table ***137*** and Table ***138*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category I and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***139***, Table ***140*** and Table ***141*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category II and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***142***, Table ***143*** and Table ***144*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category III and present the

pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.

- Tables Table ***145***, Table ***146*** and Table ***147*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category IV and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***148***, Table ***149*** and Table ***150*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category V and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Tables Table ***151***, Table ***152*** and Table ***153*** pertain to the Alternatives Level relationships associated with the derivation of local priorities with respect to Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category VI and present the pairwise comparison, the normalized pairwise comparison with calculated PVs, and the CR check, respectively.
- Table 154 presents the model synthesis and the derivation of global priorities for the entire AHP analysis.
- Lastly, Table 155 presents the summary of global priorities for the AHP analysis.

Table 52. Specimen: Analysis via AHP: Pairwise Comparison Criteria to Goal, Level 2 to 1.

	$C_{Rn\text{-}222}$	**Distance**	**Elevation**	**W. Exp.**

C_{Rn-222}	1.0000	0.1111	0.1429	0.1429
Distance	9.0000	1.0000	3.0000	0.5000
Elevation	7.0000	0.3333	1.0000	0.3333
W. Exp.	7.0000	2.0000	3.0000	1.0000
Sum	24.0000	3.4444	7.1429	1.9762

Table 53. Specimen: Analysis via AHP: Normalized Pairwise Comparison Criteria to Goal, Level 2 to 1, with Priority Vectors.

	C_{Rn-222}	**Distance**	**Elevation**	**W. Exp.**	**PV**
C_{Rn-222}	0.0417	0.0323	0.0200	0.0723	0.0416
Distance	0.3750	0.2903	0.4200	0.2530	0.3346
Elevation	0.2917	0.0968	0.1400	0.1687	0.1743
W. Exp.	0.2917	0.5806	0.4200	0.5060	0.4496

Table 54. Specimen: Analysis via AHP: Consistency Ratio Check for Pairwise Comparison Criteria to Goal, Level 2 to 1.

	C_{Rn-222}	**Distance**	**Elevation**	**W. Exp.**	**WS**	**WS / PV**
PV	0.0416	0.3346	0.1743	0.4496	1.0000	
C_{Rn-222}	0.0416	0.0372	0.0249	0.0642	0.1679	4.0394
Distance	0.3740	0.3346	0.5228	0.2248	1.4562	4.3523
Elevation	0.2909	0.1115	0.1743	0.1499	0.7265	4.1688
W. Exp.	0.2909	0.6692	0.5228	0.4496	1.9325	4.2983
Size of *n*	4.0000					
Sum	16.8589					
Sum/*n* = λ_{max}	4.2147					
CI	0.0716					
RI	0.8045					
CR	0.0890					

Table 55. Specimen: Analysis via AHP: Pairwise Comparison Sub-Criteria to Criteria, Level 3 to 2, Relative Distance.

	LTP	**5-Off**	**6-Off**	**4-Off**

LTP	1.0000	2.0000	2.0000	3.0000
5-Off	0.5000	1.0000	1.0000	2.0000
6-Off	0.5000	1.0000	1.0000	2.0000
4-Off	0.3333	0.5000	0.5000	1.0000
Sum	2.3333	4.5000	4.5000	8.0000

Table 56. Specimen: Analysis via AHP: Normalized Pairwise Comparison Sub-Criteria to Criteria, Level 3 to 2, Relative Distance, with Priority Vectors.

	LTP	**5-Off**	**6-Off**	**4-Off**	**PV**
LTP	0.4286	0.4444	0.4444	0.3750	0.4231
5-Off	0.2143	0.2222	0.2222	0.2500	0.2272
6-Off	0.2143	0.2222	0.2222	0.2500	0.2272
4-Off	0.1429	0.1111	0.1111	0.1250	0.1225

Table 57. Specimen: Analysis via AHP: Consistency Ratio Check for Pairwise Comparison Sub-Criteria to Criteria, Level 2 to 3, Relative Distance.

	LTP	**5-Off**	**6-Off**	**4-Off**	**WS**	**WS / PV**
PV	0.4231	0.2272	0.2272	0.1225	1.0000	
LTP	0.4231	0.4544	0.4544	0.3676	1.6994	4.0164
5-Off	0.2116	0.2272	0.2272	0.2450	0.9110	4.0098
6-Off	0.2116	0.2272	0.2272	0.2450	0.9110	4.0098
4-Off	0.1410	0.1136	0.1136	0.1225	0.4907	4.0054
Size of *n*	4.0000					
Sum	16.0415					
Sum/*n* = λ_{max}	4.0104					
CI	0.0035					
RI	0.8045					
CR	0.0043					

Table 58. Specimen: Analysis via AHP: Pairwise Comparison Sub-Criteria to Criteria, Level 3 to 2, Windward Exposure.

	LTP	**5-Off**	**6-Off**	**4-Off**

LTP	1.0000	0.3333	0.3333	0.1250
5-Off	3.0000	1.0000	1.0000	0.3333
6-Off	3.0000	1.0000	1.0000	0.3333
4-Off	8.0000	3.0000	3.0000	1.0000
Sum	15.0000	5.3333	5.3333	1.7917

Table 59. Specimen: Analysis via AHP: Normalized Pairwise Comparison Sub-Criteria to Criteria, Level 3 to 2, Windward Exposure, with Priority Vectors.

	LTP	**5-Off**	**6-Off**	**4-Off**	**PV**
LTP	0.0667	0.0625	0.0625	0.0698	0.0654
5-Off	0.2000	0.1875	0.1875	0.1860	0.1903
6-Off	0.2000	0.1875	0.1875	0.1860	0.1903
4-Off	0.5333	0.5625	0.5625	0.5581	0.5541

Table 60. Specimen: Analysis via AHP: Consistency Ratio Check for Pairwise Comparison Sub-Criteria to Criteria, Level 3 to 2, Windward Exposure.

	LTP	**5-Off**	**6-Off**	**4-Off**	**WS**	**WS / PV**
PV	0.0654	0.1903	0.1903	0.5541	1.0000	
LTP	0.0654	0.0634	0.0634	0.0693	0.2615	4.0005
5-Off	0.1961	0.1903	0.1903	0.1847	0.7613	4.0014
6-Off	0.1961	0.1903	0.1903	0.1847	0.7613	4.0014
4-Off	0.5229	0.5708	0.5708	0.5541	2.2186	4.0038
Size of *n*	4.0000					
Sum	16.0069					
Sum/*n* = λ_{max}	4.0017					
CI	0.0006					
RI	0.8045					
CR	0.0007					

Table 61. Specimen: Analysis via AHP: Pairwise Comparison Sub-Criteria to Sub-Criteria, Level 4 to 3, Wind Speed Category.

	0.5 < *n* < 2.1	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**
0.5 < n < 2.1	1.0000	3.0000	5.0000	7.0000	9.0000	9.0000
2.1 < n < 3.6	0.3333	1.0000	3.0000	5.0000	7.0000	9.0000
3.6 < n < 5.7	0.2000	0.3333	1.0000	3.0000	5.0000	7.0000
5.7 < n 8.8	0.1429	0.2000	0.3333	1.0000	3.0000	5.0000
8.8 < n < 11.1	0.1111	0.1429	0.2000	0.3333	1.0000	3.0000
n > 11.1	0.1111	0.1111	0.1429	0.2000	0.3333	1.0000
Sum	1.8984	4.7873	9.6762	16.5333	25.3333	34.0000

Table 62. Specimen: Analysis via AHP: Normalized Pairwise Comparison Sub-Criteria to Sub-Criteria, Level 4 to 3, Wind Speed Category, with Priority Vectors.

	0.5 < *n* < 2.1	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**	**PV**
0.5 < n < 2.1	0.5268	0.6267	0.5167	0.4234	0.3553	0.2647	0.4523
2.1 < n < 3.6	0.1756	0.2089	0.3100	0.3024	0.2763	0.2647	0.2563
3.6 < n < 5.7	0.1054	0.0696	0.1033	0.1815	0.1974	0.2059	0.1438
5.7 < n 8.8	0.0753	0.0418	0.0344	0.0605	0.1184	0.1471	0.0796
8.8 < n < 11.1	0.0585	0.0298	0.0207	0.0202	0.0395	0.0882	0.0428
n > 11.1	0.0585	0.0232	0.0148	0.0121	0.0132	0.0294	0.0252

Table 63. Specimen: Analysis via AHP: Consistency Ratio Check for Pairwise Comparison Sub-Criteria to Sub-Criteria, Level 4 to 3, Wind Speed Category.

	0.5 < *n* < 2.1	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**	**WS**	**WS / PV**
PV	0.4523	0.2563	0.1438	0.0796	0.0428	0.0252	1.0000	
0.5 < n < 2.1	0.4523	0.7690	0.7192	0.5570	0.3854	0.2268	3.1095	6.8757
2.1 < n < 3.6	0.1508	0.2563	0.4315	0.3979	0.2997	0.2268	1.7629	6.8777
3.6 < n < 5.7	0.0905	0.0854	0.1438	0.2387	0.2141	0.1764	0.9489	6.5970
5.7 < n 8.8	0.0646	0.0513	0.0479	0.0796	0.1285	0.1260	0.4978	6.2561
8.8 < n < 11.1	0.0503	0.0366	0.0288	0.0265	0.0428	0.0756	0.2606	6.0853
n > 11.1	0.0503	0.0285	0.0205	0.0159	0.0143	0.0252	0.1547	6.1386
Size of *n*	6.0000							
Sum	38.8305							
Sum/*n* = λ_{max}	6.4718							
CI	0.0944							
RI	1.1797							
CR	0.0800							

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Table 64. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Alternatives Pairwise Comparison with Respect to Measured ^{222}Rn Concentration.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	2.0000	1.0000	0.3333	0.2500	0.1429	1.0000	2.0000	2.0000	0.5000
2	1.0000	1.0000	0.5000	1.0000	0.5000	0.3333	0.2500	0.1429	1.0000	2.0000	2.0000	1.0000
3	1.0000	2.0000	1.0000	2.0000	2.0000	0.5000	0.2500	0.1429	0.5000	2.0000	2.0000	0.5000
4	0.5000	1.0000	0.5000	1.0000	1.0000	0.5000	0.2500	0.1429	0.5000	1.0000	1.0000	1.0000
5	1.0000	2.0000	0.5000	1.0000	1.0000	0.5000	0.2500	0.1429	1.0000	0.5000	0.5000	1.0000
6	3.0000	3.0000	2.0000	2.0000	2.0000	1.0000	0.2000	0.1429	3.0000	3.0000	3.0000	2.0000
7	4.0000	4.0000	4.0000	4.0000	4.0000	5.0000	1.0000	0.1667	5.0000	5.0000	5.0000	3.0000
1A	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	6.0000	1.0000	7.0000	7.0000	7.0000	7.0000
1-Off	1.0000	1.0000	2.0000	2.0000	1.0000	0.3333	0.2000	0.1429	1.0000	3.0000	3.0000	2.0000
2-Off	0.5000	0.5000	0.5000	1.0000	2.0000	0.3333	0.2000	0.1429	0.3333	1.0000	2.0000	1.0000
3-Off	0.5000	0.5000	0.5000	1.0000	2.0000	0.3333	0.2000	0.1429	0.3333	0.5000	1.0000	1.0000
16	2.0000	1.0000	2.0000	1.0000	1.0000	0.5000	0.3333	0.1429	0.5000	1.0000	1.0000	1.0000
Sum	22.5000	24.0000	21.5000	25.0000	24.5000	16.6667	9.3833	2.5952	21.1667	28.0000	29.5000	21.0000

Table 65. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Normalized Alternatives Pairwise Comparison with Respect to Measured ^{222}Rn Concentration, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0444	0.0417	0.0465	0.0800	0.0408	0.0200	0.0266	0.0550	0.0472	0.0714	0.0678	0.0238	0.0471
2	0.0444	0.0417	0.0233	0.0400	0.0204	0.0200	0.0266	0.0550	0.0472	0.0714	0.0678	0.0476	0.0421
3	0.0444	0.0833	0.0465	0.0800	0.0816	0.0300	0.0266	0.0550	0.0236	0.0714	0.0678	0.0238	0.0529
4	0.0222	0.0417	0.0233	0.0400	0.0408	0.0300	0.0266	0.0550	0.0236	0.0357	0.0339	0.0476	0.0350
5	0.0444	0.0833	0.0233	0.0400	0.0408	0.0300	0.0266	0.0550	0.0472	0.0179	0.0169	0.0476	0.0394
6	0.1333	0.1250	0.0930	0.0800	0.0816	0.0600	0.0213	0.0550	0.1417	0.1071	0.1017	0.0952	0.0913
7	0.1778	0.1667	0.1860	0.1600	0.1633	0.3000	0.1066	0.0642	0.2362	0.1786	0.1695	0.1429	0.1710
1A	0.3111	0.2917	0.3256	0.2800	0.2857	0.4200	0.6394	0.3853	0.3307	0.2500	0.2373	0.3333	0.3408
1-Off	0.0444	0.0417	0.0930	0.0800	0.0408	0.0200	0.0213	0.0550	0.0472	0.1071	0.1017	0.0952	0.0623
2-Off	0.0222	0.0208	0.0233	0.0400	0.0816	0.0200	0.0213	0.0550	0.0157	0.0357	0.0678	0.0476	0.0376
3-Off	0.0222	0.0208	0.0233	0.0400	0.0816	0.0200	0.0213	0.0550	0.0157	0.0179	0.0339	0.0476	0.0333
16	0.0889	0.0417	0.0930	0.0400	0.0408	0.0300	0.0355	0.0550	0.0236	0.0357	0.0339	0.0476	0.0472

Table 66 Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Alternatives Pairwise Comparison with Respect to Measured ^{222}Rn Concentration.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0471	0.0421	0.0529	0.0350	0.0394	0.0913	0.1710	0.3408	0.0623	0.0376	0.0333	0.0472	1.0000	
1	0.0471	0.0421	0.0529	0.0701	0.0394	0.0304	0.0427	0.0487	0.0623	0.0752	0.0666	0.0236	0.6011	12.7580
2	0.0471	0.0421	0.0264	0.0350	0.0197	0.0304	0.0427	0.0487	0.0623	0.0752	0.0666	0.0472	0.5435	12.9010
3	0.0471	0.0843	0.0529	0.0701	0.0789	0.0456	0.0427	0.0487	0.0312	0.0752	0.0666	0.0236	0.6667	12.6145
4	0.0236	0.0421	0.0264	0.0350	0.0394	0.0456	0.0427	0.0487	0.0312	0.0376	0.0333	0.0472	0.4528	12.9230
5	0.0471	0.0843	0.0264	0.0350	0.0394	0.0456	0.0427	0.0487	0.0623	0.0188	0.0166	0.0472	0.5142	13.0406
6	0.1414	0.1264	0.1057	0.0701	0.0789	0.0913	0.0342	0.0487	0.1869	0.1128	0.0999	0.0943	1.1904	13.0438
7	0.1885	0.1685	0.2114	0.1402	0.1577	0.4563	0.1710	0.0568	0.3115	0.1880	0.1664	0.1415	2.3578	13.7904
1A	0.3298	0.2949	0.3700	0.2453	0.2760	0.6388	1.0258	0.3408	0.4361	0.2632	0.2330	0.3301	4.7839	14.0355
1-Off	0.0471	0.0421	0.1057	0.0701	0.0394	0.0304	0.0342	0.0487	0.0623	0.1128	0.0999	0.0943	0.7870	12.6326
2-Off	0.0236	0.0211	0.0264	0.0350	0.0789	0.0304	0.0342	0.0487	0.0208	0.0376	0.0666	0.0472	0.4704	12.5100
3-Off	0.0236	0.0211	0.0264	0.0350	0.0789	0.0304	0.0342	0.0487	0.0208	0.0188	0.0333	0.0472	0.4183	12.5662
16	0.0942	0.0421	0.1057	0.0350	0.0394	0.0456	0.0570	0.0487	0.0312	0.0376	0.0333	0.0472	0.6171	13.0866

Size of *n*	12.0000
Sum	155.9022
Sum/*n* = λ_{max}	12.9918
CI	0.0902
RI	1.4497
CR	0.0622

Table 67. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from the LTP.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	0.5000	0.1667	0.1250	0.1111	0.1667
2	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2000	0.1429	0.1250	0.2000
3	3.0000	2.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2000	0.1429	0.1250	0.2000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2000	0.1667	0.1250	0.2000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.5000	0.1667	0.1250	0.1111	0.1667
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.2000	0.1429	0.1250	0.2000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1667	0.1429	0.1250	0.1667
1A	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	1.0000	1.0000	0.2500	0.1667	0.1429	0.2500
1-Off	6.0000	5.0000	5.0000	5.0000	6.0000	5.0000	6.0000	4.0000	1.0000	0.5000	0.3333	1.0000
2-Off	8.0000	7.0000	7.0000	6.0000	8.0000	7.0000	7.0000	6.0000	2.0000	1.0000	0.5000	2.0000
3-Off	9.0000	8.0000	8.0000	8.0000	9.0000	8.0000	8.0000	7.0000	3.0000	2.0000	1.0000	3.0000
16	6.0000	5.0000	5.0000	5.0000	6.0000	5.0000	6.0000	4.0000	1.0000	0.5000	0.3333	1.0000
Sum	40.0000	34.0000	31.8333	32.0000	38.0000	33.0000	35.0000	28.0000	8.5500	5.1548	3.1567	8.5500

Table 68. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Normalized Alternatives Pairwise Comparison with Respect to Distance from the LTP, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.0250	0.0294	0.0105	0.0313	0.0263	0.0303	0.0286	0.0179	0.0195	0.0242	0.0352	0.0195	0.0248
2	0.0250	0.0294	0.0157	0.0313	0.0263	0.0303	0.0286	0.0357	0.0234	0.0277	0.0396	0.0234	0.0280
3	0.0750	0.0588	0.0314	0.0313	0.0263	0.0303	0.0286	0.0357	0.0234	0.0277	0.0396	0.0234	0.0360
4	0.0250	0.0294	0.0314	0.0313	0.0263	0.0303	0.0286	0.0357	0.0234	0.0323	0.0396	0.0234	0.0297
5	0.0250	0.0294	0.0314	0.0313	0.0263	0.0303	0.0286	0.0179	0.0195	0.0242	0.0352	0.0195	0.0265
6	0.0250	0.0294	0.0314	0.0313	0.0263	0.0303	0.0286	0.0357	0.0234	0.0277	0.0396	0.0234	0.0293
7	0.0250	0.0294	0.0314	0.0313	0.0263	0.0303	0.0286	0.0357	0.0195	0.0277	0.0396	0.0195	0.0287
1A	0.0500	0.0294	0.0314	0.0313	0.0526	0.0303	0.0286	0.0357	0.0292	0.0323	0.0453	0.0292	0.0354
1-Off	0.1500	0.1471	0.1571	0.1563	0.1579	0.1515	0.1714	0.1429	0.1170	0.0970	0.1056	0.1170	0.1392
2-Off	0.2000	0.2059	0.2199	0.1875	0.2105	0.2121	0.2000	0.2143	0.2339	0.1940	0.1584	0.2339	0.2059
3-Off	0.2250	0.2353	0.2513	0.2500	0.2368	0.2424	0.2286	0.2500	0.3509	0.3880	0.3168	0.3509	0.2772
16	0.1500	0.1471	0.1571	0.1563	0.1579	0.1515	0.1714	0.1429	0.1170	0.0970	0.1056	0.1170	0.1392

Table 69. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from the LTP.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0248	0.0280	0.0360	0.0297	0.0265	0.0293	0.0287	0.0354	0.1392	0.2059	0.2772	0.1392	1.0000	
1	0.0248	0.0280	0.0120	0.0297	0.0265	0.0293	0.0287	0.0177	0.0232	0.0257	0.0308	0.0232	0.2998	12.0872
2	0.0248	0.0280	0.0180	0.0297	0.0265	0.0293	0.0287	0.0354	0.0278	0.0294	0.0346	0.0278	0.3403	12.1402
3	0.0744	0.0561	0.0360	0.0297	0.0265	0.0293	0.0287	0.0354	0.0278	0.0294	0.0346	0.0278	0.4359	12.1230
4	0.0248	0.0280	0.0360	0.0297	0.0265	0.0293	0.0287	0.0354	0.0278	0.0343	0.0346	0.0278	0.3632	12.2182
5	0.0248	0.0280	0.0360	0.0297	0.0265	0.0293	0.0287	0.0177	0.0232	0.0257	0.0308	0.0232	0.3237	12.1955
6	0.0248	0.0280	0.0360	0.0297	0.0265	0.0293	0.0287	0.0354	0.0278	0.0294	0.0346	0.0278	0.3583	12.2114
7	0.0248	0.0280	0.0360	0.0297	0.0265	0.0293	0.0287	0.0354	0.0232	0.0294	0.0346	0.0232	0.3490	12.1645
1A	0.0496	0.0280	0.0360	0.0297	0.0531	0.0293	0.0287	0.0354	0.0348	0.0343	0.0396	0.0348	0.4334	12.2267
1-Off	0.1488	0.1402	0.1798	0.1486	0.1593	0.1467	0.1721	0.1418	0.1392	0.1029	0.0924	0.1392	1.7110	12.2905
2-Off	0.1984	0.1962	0.2517	0.1783	0.2124	0.2054	0.2008	0.2127	0.2784	0.2059	0.1386	0.2784	2.5572	12.4217
3-Off	0.2232	0.2242	0.2877	0.2378	0.2389	0.2347	0.2295	0.2481	0.4176	0.4117	0.2772	0.4176	3.4484	12.4417
16	0.1488	0.1402	0.1798	0.1486	0.1593	0.1467	0.1721	0.1418	0.1392	0.1029	0.0924	0.1392	1.7110	12.2905

Size of *n*	12.0000
Sum	146.8111
Sum/*n* = λ_{max}	12.2343
CI	0.0213
RI	1.4497
CR	0.0147

Table 70. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 5-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.5000	0.3333	0.2000	0.2500	0.5000	0.2500	1.0000	1.0000	0.5000	0.2000	4.0000
2	2.0000	1.0000	0.5000	0.2500	0.5000	1.0000	0.3333	3.0000	2.0000	1.0000	0.2500	5.0000
3	3.0000	2.0000	1.0000	0.5000	1.0000	2.0000	0.5000	5.0000	4.0000	1.0000	0.5000	7.0000
4	5.0000	4.0000	2.0000	1.0000	2.0000	3.0000	1.0000	6.0000	5.0000	3.0000	1.0000	9.0000
5	4.0000	2.0000	1.0000	0.5000	1.0000	2.0000	0.5000	5.0000	4.0000	2.0000	0.5000	7.0000
6	2.0000	1.0000	0.5000	0.3333	0.5000	1.0000	0.3333	3.0000	2.0000	1.0000	0.3333	5.0000
7	4.0000	3.0000	2.0000	1.0000	2.0000	3.0000	1.0000	6.0000	4.0000	2.0000	1.0000	8.0000
1A	1.0000	0.3333	0.2000	0.1667	0.2000	0.3333	0.1667	1.0000	0.5000	0.3333	0.1429	2.0000
1-Off	1.0000	0.5000	0.2500	0.2000	0.2500	0.5000	0.2500	2.0000	1.0000	0.5000	0.2000	4.0000
2-Off	2.0000	1.0000	1.0000	0.3333	0.5000	1.0000	0.5000	3.0000	2.0000	1.0000	0.3333	6.0000
3-Off	5.0000	4.0000	2.0000	1.0000	2.0000	3.0000	1.0000	7.0000	5.0000	3.0000	1.0000	9.0000
16	0.2500	0.2000	0.1429	0.1111	0.1429	0.2000	0.1250	0.5000	0.2500	0.1667	0.1111	1.0000
Sum	30.2500	19.5333	10.9262	5.5944	10.3429	17.5333	5.9583	42.5000	30.7500	15.5000	5.5706	67.0000

Table 71. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Normalized Alternatives Pairwise Comparison with Respect to Distance from 5-Off, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0331	0.0256	0.0305	0.0357	0.0242	0.0285	0.0420	0.0235	0.0325	0.0323	0.0359	0.0597	0.0336
2	0.0661	0.0512	0.0458	0.0447	0.0483	0.0570	0.0559	0.0706	0.0650	0.0645	0.0449	0.0746	0.0574
3	0.0992	0.1024	0.0915	0.0894	0.0967	0.1141	0.0839	0.1176	0.1301	0.0645	0.0898	0.1045	0.0986
4	0.1653	0.2048	0.1830	0.1787	0.1934	0.1711	0.1678	0.1412	0.1626	0.1935	0.1795	0.1343	0.1729
5	0.1322	0.1024	0.0915	0.0894	0.0967	0.1141	0.0839	0.1176	0.1301	0.1290	0.0898	0.1045	0.1068
6	0.0661	0.0512	0.0458	0.0596	0.0483	0.0570	0.0559	0.0706	0.0650	0.0645	0.0598	0.0746	0.0599
7	0.1322	0.1536	0.1830	0.1787	0.1934	0.1711	0.1678	0.1412	0.1301	0.1290	0.1795	0.1194	0.1566
1A	0.0331	0.0171	0.0183	0.0298	0.0193	0.0190	0.0280	0.0235	0.0163	0.0215	0.0256	0.0299	0.0234
1-Off	0.0331	0.0256	0.0229	0.0357	0.0242	0.0285	0.0420	0.0471	0.0325	0.0323	0.0359	0.0597	0.0349
2-Off	0.0661	0.0512	0.0915	0.0596	0.0483	0.0570	0.0839	0.0706	0.0650	0.0645	0.0598	0.0896	0.0673
3-Off	0.1653	0.2048	0.1830	0.1787	0.1934	0.1711	0.1678	0.1647	0.1626	0.1935	0.1795	0.1343	0.1749
16	0.0083	0.0102	0.0131	0.0199	0.0138	0.0114	0.0210	0.0118	0.0081	0.0108	0.0199	0.0149	0.0136

Table 72. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 5-Off.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0336	0.0574	0.0986	0.1729	0.1068	0.0599	0.1566	0.0234	0.0349	0.0673	0.1749	0.0136	1.0000	
1	0.0336	0.0287	0.0329	0.0346	0.0267	0.0299	0.0391	0.0234	0.0349	0.0336	0.0350	0.0544	0.4070	12.1038
2	0.0672	0.0574	0.0493	0.0432	0.0534	0.0599	0.0522	0.0703	0.0699	0.0673	0.0437	0.0680	0.7019	12.2288
3	0.1009	0.1148	0.0986	0.0865	0.1068	0.1198	0.0783	0.1172	0.1398	0.0673	0.0875	0.0952	1.2125	12.2929
4	0.1681	0.2296	0.1973	0.1729	0.2135	0.1796	0.1566	0.1407	0.1747	0.2018	0.1749	0.1224	2.1322	12.3286
5	0.1345	0.1148	0.0986	0.0865	0.1068	0.1198	0.0783	0.1172	0.1398	0.1345	0.0875	0.0952	1.3134	12.3017
6	0.0672	0.0574	0.0493	0.0576	0.0534	0.0599	0.0522	0.0703	0.0699	0.0673	0.0583	0.0680	0.7308	12.2048
7	0.1345	0.1722	0.1973	0.1729	0.2135	0.1796	0.1566	0.1407	0.1398	0.1345	0.1749	0.1088	1.9253	12.2951
1A	0.0336	0.0191	0.0197	0.0288	0.0214	0.0200	0.0261	0.0234	0.0175	0.0224	0.0250	0.0272	0.2842	12.1241
1-Off	0.0336	0.0287	0.0247	0.0346	0.0267	0.0299	0.0391	0.0469	0.0349	0.0336	0.0350	0.0544	0.4222	12.0805
2-Off	0.0672	0.0574	0.0986	0.0576	0.0534	0.0599	0.0783	0.0703	0.0699	0.0673	0.0583	0.0816	0.8199	12.1876
3-Off	0.1681	0.2296	0.1973	0.1729	0.2135	0.1796	0.1566	0.1641	0.1747	0.2018	0.1749	0.1224	2.1556	12.3244
16	0.0084	0.0115	0.0141	0.0192	0.0153	0.0120	0.0196	0.0117	0.0087	0.0112	0.0194	0.0136	0.1647	12.1132

Size of *n*	12.0000
Sum	146.5853
Sum/*n* = λ_{max}	12.2154
CI	0.0196
RI	1.4497
CR	0.0135

Table 73. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 6-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	1.0000	1.0000
2	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	1.0000	1.0000
3	2.0000	2.0000	1.0000	3.0000	2.0000	2.0000	2.0000	1.0000	0.1667	1.0000	3.0000	3.0000
4	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
5	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
6	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
7	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	2.0000	1.0000
1-Off	8.0000	8.0000	6.0000	9.0000	9.0000	9.0000	9.0000	8.0000	1.0000	7.0000	9.0000	9.0000
2-Off	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1429	1.0000	2.0000	2.0000
3-Off	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	0.5000	0.1111	0.5000	1.0000	1.0000
16	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
Sum	20.0000	20.0000	12.5000	22.0000	21.0000	21.0000	21.0000	18.5000	2.3512	17.0000	24.0000	23.0000

Table 74. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Normalized Alternatives Pairwise Comparison with Respect to Distance from 6-Off, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0417	0.0435	0.0483
2	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0417	0.0435	0.0483
3	0.1000	0.1000	0.0800	0.1364	0.0952	0.0952	0.0952	0.0541	0.0709	0.0588	0.1250	0.1304	0.0951
4	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0467
5	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
6	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
7	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
1A	0.0500	0.0500	0.0800	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0833	0.0435	0.0551
1-Off	0.4000	0.4000	0.4800	0.4091	0.4286	0.4286	0.4286	0.4324	0.4253	0.4118	0.3750	0.3913	0.4176
2-Off	0.0500	0.0500	0.0800	0.0455	0.0476	0.0476	0.0476	0.0541	0.0608	0.0588	0.0833	0.0870	0.0594
3-Off	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0270	0.0473	0.0294	0.0417	0.0435	0.0420
16	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0294	0.0417	0.0435	0.0442

Table 75. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 6-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.4176	0.0594	0.0420	0.0442	1.0000	
1	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0420	0.0442	0.5871	12.1572
2	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0420	0.0442	0.5871	12.1572
3	0.0966	0.0966	0.0951	0.1401	0.0956	0.0956	0.0956	0.0551	0.0696	0.0594	0.1260	0.1327	1.1578	12.1742
4	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5654	12.1110
5	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
6	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
7	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
1A	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0840	0.0442	0.6766	12.2806
1-Off	0.3863	0.3863	0.5706	0.4202	0.4302	0.4302	0.4302	0.4408	0.4176	0.4155	0.3779	0.3981	5.1039	12.2233
2-Off	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.0597	0.0594	0.0840	0.0885	0.7283	12.2710
3-Off	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0275	0.0464	0.0297	0.0420	0.0442	0.5082	12.1047
16	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0297	0.0420	0.0442	0.5358	12.1111

Size of *n*	12.0000
Sum	146.0733
Sum/*n* = λ_{max}	12.1728
CI	0.0157
RI	1.4497
CR	0.0108

Table 76. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 4-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	1.0000	1.0000
2	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	1.0000	1.0000
3	2.0000	2.0000	1.0000	3.0000	2.0000	2.0000	2.0000	1.0000	0.1667	1.0000	3.0000	3.0000
4	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
5	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
6	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
7	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	1.0000	1.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	2.0000	1.0000
1-Off	8.0000	8.0000	6.0000	9.0000	9.0000	9.0000	9.0000	8.0000	1.0000	7.0000	9.0000	9.0000
2-Off	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1429	1.0000	2.0000	2.0000
3-Off	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	0.5000	0.1111	0.5000	1.0000	1.0000
16	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
Sum	20.0000	20.0000	12.5000	22.0000	21.0000	21.0000	21.0000	18.5000	2.3512	17.0000	24.0000	23.0000

Table 77. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Normalized Alternatives Pairwise Comparison with Respect to Distance from 4-Off, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0417	0.0435	0.0483
2	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0417	0.0435	0.0483
3	0.1000	0.1000	0.0800	0.1364	0.0952	0.0952	0.0952	0.0541	0.0709	0.0588	0.1250	0.1304	0.0951
4	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0467
5	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
6	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
7	0.0500	0.0500	0.0400	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0588	0.0417	0.0435	0.0478
1A	0.0500	0.0500	0.0800	0.0455	0.0476	0.0476	0.0476	0.0541	0.0532	0.0588	0.0833	0.0435	0.0551
1-Off	0.4000	0.4000	0.4800	0.4091	0.4286	0.4286	0.4286	0.4324	0.4253	0.4118	0.3750	0.3913	0.4176
2-Off	0.0500	0.0500	0.0800	0.0455	0.0476	0.0476	0.0476	0.0541	0.0608	0.0588	0.0833	0.0870	0.0594
3-Off	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0270	0.0473	0.0294	0.0417	0.0435	0.0420
16	0.0500	0.0500	0.0267	0.0455	0.0476	0.0476	0.0476	0.0541	0.0473	0.0294	0.0417	0.0435	0.0442

Table 78. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 3, Alternatives Pairwise Comparison with Respect to Distance from 4-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.4176	0.0594	0.0420	0.0442	1.0000	
1	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0420	0.0442	0.5871	12.1572
2	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0420	0.0442	0.5871	12.1572
3	0.0966	0.0966	0.0951	0.1401	0.0956	0.0956	0.0956	0.0551	0.0696	0.0594	0.1260	0.1327	1.1578	12.1742
4	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5654	12.1110
5	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
6	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
7	0.0483	0.0483	0.0476	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0594	0.0420	0.0442	0.5813	12.1610
1A	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.0522	0.0594	0.0840	0.0442	0.6766	12.2806
1-Off	0.3863	0.3863	0.5706	0.4202	0.4302	0.4302	0.4302	0.4408	0.4176	0.4155	0.3779	0.3981	5.1039	12.2233
2-Off	0.0483	0.0483	0.0951	0.0467	0.0478	0.0478	0.0478	0.0551	0.0597	0.0594	0.0840	0.0885	0.7283	12.2710
3-Off	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0275	0.0464	0.0297	0.0420	0.0442	0.5082	12.1047
16	0.0483	0.0483	0.0317	0.0467	0.0478	0.0478	0.0478	0.0551	0.0464	0.0297	0.0420	0.0442	0.5358	12.1111

Size of *n*	12.0000
Sum	146.0733
Sum/*n* = λ_{max}	12.1728
CI	0.0157
RI	1.4497
CR	0.0108

Table 79. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Alternatives Pairwise Comparison with Respect to Elevation.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
3	1.0000	1.0000	1.0000	2.0000	2.0000	2.0000	2.0000	2.0000	0.1429	1.0000	3.0000	3.0000
4	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
5	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
6	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
7	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1111	0.5000	1.0000	1.0000
1A	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	1.0000	1.0000	0.1250	1.0000	3.0000	3.0000
1-Off	9.0000	9.0000	7.0000	9.0000	9.0000	9.0000	9.0000	8.0000	1.0000	8.0000	9.0000	9.0000
2-Off	2.0000	2.0000	1.0000	2.0000	2.0000	2.0000	2.0000	1.0000	0.1250	1.0000	2.0000	2.0000
3-Off	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	0.3333	0.1111	0.5000	1.0000	1.0000
16	1.0000	1.0000	0.3333	1.0000	1.0000	1.0000	1.0000	0.3333	0.1111	0.5000	1.0000	1.0000
Sum	21.0000	21.0000	14.1667	22.0000	22.0000	22.0000	22.0000	18.6667	2.2817	15.0000	25.0000	25.0000

Table 80. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Normalized Alternatives Pairwise Comparison with Respect to Elevation, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0476	0.0476	0.0706	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0469
2	0.0476	0.0476	0.0706	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0469
3	0.0476	0.0476	0.0706	0.0909	0.0909	0.0909	0.0909	0.1071	0.0626	0.0667	0.1200	0.1200	0.0838
4	0.0476	0.0476	0.0353	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0440
5	0.0476	0.0476	0.0353	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0440
6	0.0476	0.0476	0.0353	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0440
7	0.0476	0.0476	0.0353	0.0455	0.0455	0.0455	0.0455	0.0536	0.0487	0.0333	0.0400	0.0400	0.0440
1A	0.0476	0.0476	0.0353	0.0455	0.0455	0.0455	0.0455	0.0536	0.0548	0.0667	0.1200	0.1200	0.0606
1-Off	0.4286	0.4286	0.4941	0.4091	0.4091	0.4091	0.4091	0.4286	0.4383	0.5333	0.3600	0.3600	0.4256
2-Off	0.0952	0.0952	0.0706	0.0909	0.0909	0.0909	0.0909	0.0536	0.0548	0.0667	0.0800	0.0800	0.0800
3-Off	0.0476	0.0476	0.0235	0.0455	0.0455	0.0455	0.0455	0.0179	0.0487	0.0333	0.0400	0.0400	0.0400
16	0.0476	0.0476	0.0235	0.0455	0.0455	0.0455	0.0455	0.0179	0.0487	0.0333	0.0400	0.0400	0.0400

Table 81. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Criteria, Level 5 to 2, Alternatives Pairwise Comparison with Respect to Elevation.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0469	0.0469	0.0838	0.0440	0.0440	0.0440	0.0440	0.0606	0.4256	0.0800	0.0400	0.0400	1.0000	
1	0.0469	0.0469	0.0838	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5817	12.3923
2	0.0469	0.0469	0.0838	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5817	12.3923
3	0.0469	0.0469	0.0838	0.0880	0.0880	0.0880	0.0880	0.1212	0.0608	0.0800	0.1201	0.1201	1.0319	12.3106
4	0.0469	0.0469	0.0419	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5397	12.2681
5	0.0469	0.0469	0.0419	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5397	12.2681
6	0.0469	0.0469	0.0419	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5397	12.2681
7	0.0469	0.0469	0.0419	0.0440	0.0440	0.0440	0.0440	0.0606	0.0473	0.0400	0.0400	0.0400	0.5397	12.2681
1A	0.0469	0.0469	0.0419	0.0440	0.0440	0.0440	0.0440	0.0606	0.0532	0.0800	0.1201	0.1201	0.7458	12.3041
1-Off	0.4224	0.4224	0.5868	0.3960	0.3960	0.3960	0.3960	0.4849	0.4256	0.6398	0.3604	0.3604	5.2866	12.4200
2-Off	0.0939	0.0939	0.0838	0.0880	0.0880	0.0880	0.0880	0.0606	0.0532	0.0800	0.0801	0.0801	0.9775	12.2222
3-Off	0.0469	0.0469	0.0279	0.0440	0.0440	0.0440	0.0440	0.0202	0.0473	0.0400	0.0400	0.0400	0.4854	12.1222
16	0.0469	0.0469	0.0279	0.0440	0.0440	0.0440	0.0440	0.0202	0.0473	0.0400	0.0400	0.0400	0.4854	12.1222

Size of *n*	12.0000
Sum	147.3581
Sum/*n* = λ_{max}	12.2798
CI	0.0254
RI	1.4497
CR	0.0175

Table 82. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category I, 0.5 < *n* < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	0.3333	8.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	1.0000	1.0000	1.0000	0.5000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3	1.0000	1.0000	1.0000	0.3333	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	3.0000	2.0000	3.0000	1.0000	7.0000	2.0000	1.0000	1.0000	0.5000	0.5000	0.3333	0.3333
5	0.1250	0.1111	0.1111	0.1429	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111
6	1.0000	1.0000	1.0000	0.5000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1-Off	1.0000	1.0000	1.0000	2.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2-Off	1.0000	1.0000	1.0000	2.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
3-Off	1.0000	1.0000	1.0000	3.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16	1.0000	1.0000	1.0000	3.0000	9.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Sum	13.1250	12.1111	13.1111	14.8095	97.0000	12.1111	11.1111	11.1111	10.6111	10.6111	10.4444	10.4444

Table 83. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category I, 0.5 < *n* < 2.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0762	0.0826	0.0763	0.0225	0.0825	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0819
2	0.0762	0.0826	0.0763	0.0338	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0837
3	0.0762	0.0826	0.0763	0.0225	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0827
4	0.2286	0.1651	0.2288	0.0675	0.0722	0.1651	0.0900	0.0900	0.0471	0.0471	0.0319	0.0319	0.1055
5	0.0095	0.0092	0.0085	0.0096	0.0103	0.0092	0.0100	0.0100	0.0105	0.0105	0.0106	0.0106	0.0099
6	0.0762	0.0826	0.0763	0.0338	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0837
7	0.0762	0.0826	0.0763	0.0675	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0865
1A	0.0762	0.0826	0.0763	0.0675	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0865
1-Off	0.0762	0.0826	0.0763	0.1350	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0921
2-Off	0.0762	0.0826	0.0763	0.1350	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0921
3-Off	0.0762	0.0826	0.0763	0.2026	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0977
16	0.0762	0.0826	0.0763	0.2026	0.0928	0.0826	0.0900	0.0900	0.0942	0.0942	0.0957	0.0957	0.0977

Table 84. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0819	0.0837	0.0827	0.1055	0.0099	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0000	
1	0.0819	0.0837	0.0827	0.0352	0.0790	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	0.9988	12.1989
2	0.0819	0.0837	0.0827	0.0527	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0263	12.2650
3	0.0819	0.0837	0.0827	0.0352	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0087	12.1916
4	0.2456	0.1674	0.2482	0.1055	0.0691	0.1674	0.0865	0.0865	0.0461	0.0461	0.0326	0.0326	1.3334	12.6447
5	0.0102	0.0093	0.0092	0.0151	0.0099	0.0093	0.0096	0.0096	0.0102	0.0102	0.0109	0.0109	0.1244	12.5927
6	0.0819	0.0837	0.0827	0.0527	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0263	12.2650
7	0.0819	0.0837	0.0827	0.1055	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0790	12.4756
1A	0.0819	0.0837	0.0827	0.1055	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.0790	12.4756
1-Off	0.0819	0.0837	0.0827	0.2109	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.1845	12.8583
2-Off	0.0819	0.0837	0.0827	0.2109	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.1845	12.8583
3-Off	0.0819	0.0837	0.0827	0.3164	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.2899	13.1969
16	0.0819	0.0837	0.0827	0.3164	0.0889	0.0837	0.0865	0.0865	0.0921	0.0921	0.0977	0.0977	1.2899	13.1969

Size of n	12.0000
Sum	151.2195
Sum/n = λ_{max}	12.6016
CI	0.0547
RI	1.4497
CR	0.0377

Table 85. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category II, $2.1 < n < 3.6$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.1429	0.3333	0.3333	1.0000	0.1429	0.3333	0.5000	0.1667	0.1429	0.1250	0.2000
2	7.0000	1.0000	4.0000	4.0000	8.0000	1.0000	4.0000	6.0000	1.0000	1.0000	1.0000	2.0000
3	3.0000	0.2500	1.0000	1.0000	4.0000	0.2500	1.0000	1.0000	0.3333	0.2500	0.2000	0.5000
4	3.0000	0.2500	1.0000	1.0000	4.0000	0.2500	1.0000	1.0000	0.3333	0.2500	0.2000	0.3333
5	1.0000	0.1250	0.2500	0.2500	1.0000	0.1250	0.2500	0.5000	0.1429	0.1250	0.1111	0.1429
6	7.0000	1.0000	4.0000	4.0000	8.0000	1.0000	4.0000	6.0000	2.0000	1.0000	1.0000	2.0000
7	3.0000	0.2500	1.0000	1.0000	4.0000	0.2500	1.0000	2.0000	0.3333	0.2500	0.2000	0.5000
1A	2.0000	0.1667	1.0000	1.0000	2.0000	0.1667	0.5000	1.0000	0.2000	0.1667	0.1429	0.2000
1-Off	6.0000	1.0000	3.0000	3.0000	7.0000	0.5000	3.0000	5.0000	1.0000	0.5000	0.5000	2.0000
2-Off	7.0000	1.0000	4.0000	4.0000	8.0000	1.0000	4.0000	6.0000	2.0000	1.0000	1.0000	2.0000
3-Off	8.0000	1.0000	5.0000	5.0000	9.0000	1.0000	5.0000	7.0000	2.0000	1.0000	1.0000	2.0000
16	5.0000	0.5000	2.0000	3.0000	7.0000	0.5000	2.0000	5.0000	0.5000	0.5000	0.5000	1.0000
Sum	53.0000	6.6845	26.5833	27.5833	63.0000	6.1845	26.0833	41.0000	10.0095	6.1845	5.9790	12.8762

Table 86. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category II, 2.1 < *n* < 3.6 m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.0189	0.0214	0.0125	0.0121	0.0159	0.0231	0.0128	0.0122	0.0167	0.0231	0.0209	0.0155	0.0171
2	0.1321	0.1496	0.1505	0.1450	0.1270	0.1617	0.1534	0.1463	0.0999	0.1617	0.1673	0.1553	0.1458
3	0.0566	0.0374	0.0376	0.0363	0.0635	0.0404	0.0383	0.0244	0.0333	0.0404	0.0335	0.0388	0.0400
4	0.0566	0.0374	0.0376	0.0363	0.0635	0.0404	0.0383	0.0244	0.0333	0.0404	0.0335	0.0259	0.0390
5	0.0189	0.0187	0.0094	0.0091	0.0159	0.0202	0.0096	0.0122	0.0143	0.0202	0.0186	0.0111	0.0148
6	0.1321	0.1496	0.1505	0.1450	0.1270	0.1617	0.1534	0.1463	0.1998	0.1617	0.1673	0.1553	0.1541
7	0.0566	0.0374	0.0376	0.0363	0.0635	0.0404	0.0383	0.0488	0.0333	0.0404	0.0335	0.0388	0.0421
1A	0.0377	0.0249	0.0376	0.0363	0.0317	0.0269	0.0192	0.0244	0.0200	0.0269	0.0239	0.0155	0.0271
1-Off	0.1132	0.1496	0.1129	0.1088	0.1111	0.0808	0.1150	0.1220	0.0999	0.0808	0.0836	0.1553	0.1111
2-Off	0.1321	0.1496	0.1505	0.1450	0.1270	0.1617	0.1534	0.1463	0.1998	0.1617	0.1673	0.1553	0.1541
3-Off	0.1509	0.1496	0.1881	0.1813	0.1429	0.1617	0.1917	0.1707	0.1998	0.1617	0.1673	0.1553	0.1684
16	0.0943	0.0748	0.0752	0.1088	0.1111	0.0808	0.0767	0.1220	0.0500	0.0808	0.0836	0.0777	0.0863

Table 87. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0171	0.1458	0.0400	0.0390	0.0148	0.1541	0.0421	0.0271	0.1111	0.1541	0.1684	0.0863	1.0000	
1	0.0171	0.0208	0.0133	0.0130	0.0148	0.0220	0.0140	0.0135	0.0185	0.0220	0.0211	0.0173	0.2075	12.1481
2	0.1196	0.1458	0.1602	0.1559	0.1187	0.1541	0.1683	0.1626	0.1111	0.1541	0.1684	0.1726	1.7914	12.2861
3	0.0512	0.0365	0.0400	0.0390	0.0594	0.0385	0.0421	0.0271	0.0370	0.0385	0.0337	0.0432	0.4862	12.1411
4	0.0512	0.0365	0.0400	0.0390	0.0594	0.0385	0.0421	0.0271	0.0370	0.0385	0.0337	0.0288	0.4718	12.1080
5	0.0171	0.0182	0.0100	0.0097	0.0148	0.0193	0.0105	0.0135	0.0159	0.0193	0.0187	0.0123	0.1794	12.0911
6	0.1196	0.1458	0.1602	0.1559	0.1187	0.1541	0.1683	0.1626	0.2222	0.1541	0.1684	0.1726	1.9025	12.3432
7	0.0512	0.0365	0.0400	0.0390	0.0594	0.0385	0.0421	0.0542	0.0370	0.0385	0.0337	0.0432	0.5133	12.1986
1A	0.0342	0.0243	0.0400	0.0390	0.0297	0.0257	0.0210	0.0271	0.0222	0.0257	0.0241	0.0173	0.3302	12.1866
1-Off	0.1025	0.1458	0.1201	0.1169	0.1039	0.0771	0.1262	0.1355	0.1111	0.0771	0.0842	0.1726	1.3730	12.3594
2-Off	0.1196	0.1458	0.1602	0.1559	0.1187	0.1541	0.1683	0.1626	0.2222	0.1541	0.1684	0.1726	1.9025	12.3432
3-Off	0.1367	0.1458	0.2002	0.1948	0.1335	0.1541	0.2104	0.1897	0.2222	0.1541	0.1684	0.1726	2.0826	12.3661
16	0.0854	0.0729	0.0801	0.1169	0.1039	0.0771	0.0842	0.1355	0.0555	0.0771	0.0842	0.0863	1.0590	12.2688

Size of *n*	12.0000
Sum	146.8401
Sum/*n* = λ_{max}	12.2367
CI	0.0215
RI	1.4497
CR	0.0148

Table 88. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
1	1.0000	0.1667	0.5000	0.3333	0.5000	0.1111	0.3333	0.5000	0.1667	0.1667	0.1429	0.2500
2	6.0000	1.0000	4.0000	3.0000	4.0000	0.3333	3.0000	4.0000	1.0000	1.0000	0.5000	2.0000
3	2.0000	0.2500	1.0000	0.5000	1.0000	0.1429	0.5000	1.0000	0.2000	0.2500	0.1667	0.3333
4	3.0000	0.3333	2.0000	1.0000	1.0000	0.1667	1.0000	2.0000	0.3333	0.3333	0.2500	1.0000
5	2.0000	0.2500	1.0000	1.0000	1.0000	0.1429	1.0000	1.0000	0.2500	0.2500	0.2000	0.5000
6	9.0000	3.0000	7.0000	6.0000	7.0000	1.0000	6.0000	7.0000	3.0000	3.0000	2.0000	5.0000
7	3.0000	0.3333	2.0000	1.0000	1.0000	0.1667	1.0000	1.0000	0.3333	0.3333	0.2500	1.0000
1A	2.0000	0.2500	1.0000	0.5000	1.0000	0.1429	1.0000	1.0000	0.2000	0.2500	0.1667	0.3333
1-Off	6.0000	1.0000	5.0000	3.0000	4.0000	0.3333	3.0000	5.0000	1.0000	1.0000	1.0000	2.0000
2-Off	6.0000	1.0000	4.0000	3.0000	4.0000	0.3333	3.0000	4.0000	1.0000	1.0000	2.0000	2.0000
3-Off	7.0000	2.0000	6.0000	4.0000	5.0000	0.5000	4.0000	6.0000	1.0000	0.5000	1.0000	3.0000
16	4.0000	0.5000	3.0000	1.0000	2.0000	0.2000	1.0000	3.0000	0.5000	0.5000	0.3333	1.0000
Sum	51.0000	10.0833	36.5000	24.3333	31.5000	3.5730	24.8333	35.5000	8.9833	8.5833	8.0095	18.4167

Table 89. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < *n* < 5.7 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0196	0.0165	0.0137	0.0137	0.0159	0.0311	0.0134	0.0141	0.0186	0.0194	0.0178	0.0136	0.0173
2	0.1176	0.0992	0.1096	0.1233	0.1270	0.0933	0.1208	0.1127	0.1113	0.1165	0.0624	0.1086	0.1085
3	0.0392	0.0248	0.0274	0.0205	0.0317	0.0400	0.0201	0.0282	0.0223	0.0291	0.0208	0.0181	0.0269
4	0.0588	0.0331	0.0548	0.0411	0.0317	0.0466	0.0403	0.0563	0.0371	0.0388	0.0312	0.0543	0.0437
5	0.0392	0.0248	0.0274	0.0411	0.0317	0.0400	0.0403	0.0282	0.0278	0.0291	0.0250	0.0271	0.0318
6	0.1765	0.2975	0.1918	0.2466	0.2222	0.2799	0.2416	0.1972	0.3340	0.3495	0.2497	0.2715	0.2548
7	0.0588	0.0331	0.0548	0.0411	0.0317	0.0466	0.0403	0.0282	0.0371	0.0388	0.0312	0.0543	0.0413
1A	0.0392	0.0248	0.0274	0.0205	0.0317	0.0400	0.0403	0.0282	0.0223	0.0291	0.0208	0.0181	0.0285
1-Off	0.1176	0.0992	0.1370	0.1233	0.1270	0.0933	0.1208	0.1408	0.1113	0.1165	0.1249	0.1086	0.1184
2-Off	0.1176	0.0992	0.1096	0.1233	0.1270	0.0933	0.1208	0.1127	0.1113	0.1165	0.2497	0.1086	0.1241
3-Off	0.1373	0.1983	0.1644	0.1644	0.1587	0.1399	0.1611	0.1690	0.1113	0.0583	0.1249	0.1629	0.1459
16	0.0784	0.0496	0.0822	0.0411	0.0635	0.0560	0.0403	0.0845	0.0557	0.0583	0.0416	0.0543	0.0588

Table 90. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < n < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0173	0.1085	0.0269	0.0437	0.0318	0.2548	0.0413	0.0285	0.1184	0.1241	0.1459	0.0588	1.0000	
1	0.0173	0.0181	0.0134	0.0146	0.0159	0.0283	0.0138	0.0143	0.0197	0.0207	0.0208	0.0147	0.2116	12.2420
2	0.1037	0.1085	0.1074	0.1311	0.1272	0.0849	0.1240	0.1141	0.1184	0.1241	0.0729	0.1176	1.3340	12.2924
3	0.0346	0.0271	0.0269	0.0218	0.0318	0.0364	0.0207	0.0285	0.0237	0.0310	0.0243	0.0196	0.3264	12.1542
4	0.0518	0.0362	0.0537	0.0437	0.0318	0.0425	0.0413	0.0571	0.0395	0.0414	0.0365	0.0588	0.5342	12.2282
5	0.0346	0.0271	0.0269	0.0437	0.0318	0.0364	0.0413	0.0285	0.0296	0.0310	0.0292	0.0294	0.3895	12.2443
6	0.1555	0.3256	0.1880	0.2621	0.2227	0.2548	0.2480	0.1997	0.3551	0.3724	0.2917	0.2939	3.1696	12.4384
7	0.0518	0.0362	0.0537	0.0437	0.0318	0.0425	0.0413	0.0285	0.0395	0.0414	0.0365	0.0588	0.5057	12.2323
1A	0.0346	0.0271	0.0269	0.0218	0.0318	0.0364	0.0413	0.0285	0.0237	0.0310	0.0243	0.0196	0.3471	12.1639
1-Off	0.1037	0.1085	0.1343	0.1311	0.1272	0.0849	0.1240	0.1427	0.1184	0.1241	0.1459	0.1176	1.4624	12.3554
2-Off	0.1037	0.1085	0.1074	0.1311	0.1272	0.0849	0.1240	0.1141	0.1184	0.1241	0.2917	0.1176	1.5528	12.5096
3-Off	0.1210	0.2170	0.1611	0.1747	0.1591	0.1274	0.1654	0.1712	0.1184	0.0621	0.1459	0.1763	1.7996	12.3369
16	0.0691	0.0543	0.0806	0.0437	0.0636	0.0510	0.0413	0.0856	0.0592	0.0621	0.0486	0.0588	0.7178	12.2119

Size of *n*	12.0000
Sum	147.4096
Sum/*n* = λ_{max}	12.2841
CI	0.0258
RI	1.4497
CR	0.0178

Table 91. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category IV, $5.7 < n < 8.8$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.3333	0.1250	0.1250	0.1111	0.1667	0.3333	0.3333	0.2000	0.3333	0.1667	0.2500
2	3.0000	1.0000	3.0000	0.2000	0.2000	0.1667	0.3333	1.0000	0.5000	1.0000	0.3333	1.0000
3	8.0000	0.3333	1.0000	0.1429	0.1250	0.1111	0.1667	0.5000	0.2000	0.3333	0.2000	0.2500
4	8.0000	5.0000	7.0000	1.0000	1.0000	1.0000	2.0000	5.0000	3.0000	5.0000	2.0000	4.0000
5	9.0000	5.0000	8.0000	1.0000	1.0000	1.0000	2.0000	5.0000	2.0000	5.0000	2.0000	4.0000
6	6.0000	6.0000	9.0000	1.0000	1.0000	1.0000	3.0000	6.0000	4.0000	6.0000	3.0000	5.0000
7	3.0000	3.0000	6.0000	0.5000	0.5000	0.3333	1.0000	4.0000	1.0000	3.0000	1.0000	2.0000
1A	3.0000	1.0000	2.0000	0.2000	0.2000	0.1667	0.2500	1.0000	0.3333	1.0000	0.3333	1.0000
1-Off	5.0000	2.0000	5.0000	0.3333	0.5000	0.2500	1.0000	3.0000	1.0000	2.0000	1.0000	1.0000
2-Off	3.0000	1.0000	3.0000	0.2000	0.2000	0.1667	0.3333	1.0000	0.5000	1.0000	0.3333	1.0000
3-Off	6.0000	3.0000	5.0000	0.5000	0.5000	0.3333	1.0000	3.0000	1.0000	3.0000	1.0000	2.0000
16	4.0000	1.0000	4.0000	0.2500	0.2500	0.2000	0.5000	1.0000	1.0000	1.0000	0.5000	1.0000
Sum	59.0000	28.6667	53.1250	5.4512	5.5861	4.8944	11.9167	30.8333	14.7333	28.6667	11.8667	22.5000

Table 92. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category IV, 5.7 < n < 8.8 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0169	0.0116	0.0024	0.0229	0.0199	0.0341	0.0280	0.0108	0.0136	0.0116	0.0140	0.0111	0.0164
2	0.0508	0.0349	0.0565	0.0367	0.0358	0.0341	0.0280	0.0324	0.0339	0.0349	0.0281	0.0444	0.0375
3	0.1356	0.0116	0.0188	0.0262	0.0224	0.0227	0.0140	0.0162	0.0136	0.0116	0.0169	0.0111	0.0267
4	0.1356	0.1744	0.1318	0.1834	0.1790	0.2043	0.1678	0.1622	0.2036	0.1744	0.1685	0.1778	0.1719
5	0.1525	0.1744	0.1506	0.1834	0.1790	0.2043	0.1678	0.1622	0.1357	0.1744	0.1685	0.1778	0.1692
6	0.1017	0.2093	0.1694	0.1834	0.1790	0.2043	0.2517	0.1946	0.2715	0.2093	0.2528	0.2222	0.2041
7	0.0508	0.1047	0.1129	0.0917	0.0895	0.0681	0.0839	0.1297	0.0679	0.1047	0.0843	0.0889	0.0898
1A	0.0508	0.0349	0.0376	0.0367	0.0358	0.0341	0.0210	0.0324	0.0226	0.0349	0.0281	0.0444	0.0344
1-Off	0.0847	0.0698	0.0941	0.0611	0.0895	0.0511	0.0839	0.0973	0.0679	0.0698	0.0843	0.0444	0.0748
2-Off	0.0508	0.0349	0.0565	0.0367	0.0358	0.0341	0.0280	0.0324	0.0339	0.0349	0.0281	0.0444	0.0375
3-Off	0.1017	0.1047	0.0941	0.0917	0.0895	0.0681	0.0839	0.0973	0.0679	0.1047	0.0843	0.0889	0.0897
16	0.0678	0.0349	0.0753	0.0459	0.0448	0.0409	0.0420	0.0324	0.0679	0.0349	0.0421	0.0444	0.0478

Table 93. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category IV, 5.7 < n < 8.8 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0164	0.0375	0.0267	0.1719	0.1692	0.2041	0.0898	0.0344	0.0748	0.0375	0.0897	0.0478	1.0000	
1	0.0164	0.0125	0.0033	0.0215	0.0188	0.0340	0.0299	0.0115	0.0150	0.0125	0.0150	0.0119	0.2024	12.3296
2	0.0492	0.0375	0.0802	0.0344	0.0338	0.0340	0.0299	0.0344	0.0374	0.0375	0.0299	0.0478	0.4862	12.9507
3	0.1313	0.0125	0.0267	0.0246	0.0212	0.0227	0.0150	0.0172	0.0150	0.0125	0.0179	0.0119	0.3285	12.2910
4	0.1313	0.1877	0.1871	0.1719	0.1692	0.2041	0.1795	0.1722	0.2245	0.1877	0.1794	0.1911	2.1858	12.7149
5	0.1477	0.1877	0.2138	0.1719	0.1692	0.2041	0.1795	0.1722	0.1497	0.1877	0.1794	0.1911	2.1541	12.7286
6	0.0985	0.2253	0.2405	0.1719	0.1692	0.2041	0.2693	0.2067	0.2993	0.2253	0.2692	0.2388	2.6180	12.8264
7	0.0492	0.1126	0.1603	0.0860	0.0846	0.0680	0.0898	0.1378	0.0748	0.1126	0.0897	0.0955	1.1611	12.9356
1A	0.0492	0.0375	0.0534	0.0344	0.0338	0.0340	0.0224	0.0344	0.0249	0.0375	0.0299	0.0478	0.4395	12.7589
1-Off	0.0821	0.0751	0.1336	0.0573	0.0846	0.0510	0.0898	0.1033	0.0748	0.0751	0.0897	0.0478	0.9642	12.8859
2-Off	0.0492	0.0375	0.0802	0.0344	0.0338	0.0340	0.0299	0.0344	0.0374	0.0375	0.0299	0.0478	0.4862	12.9507
3-Off	0.0985	0.1126	0.1336	0.0860	0.0846	0.0680	0.0898	0.1033	0.0748	0.1126	0.0897	0.0955	1.1491	12.8075
16	0.0656	0.0375	0.1069	0.0430	0.0423	0.0408	0.0449	0.0344	0.0748	0.0375	0.0449	0.0478	0.6205	12.9912

Size of n	12.0000
Sum	153.1710
Sum/n = λ_{max}	12.7643
CI	0.0695
RI	1.4497
CR	0.0479

Table 94. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	0.1250	0.1250	0.1250	0.3333	0.2500	0.3333	1.0000	0.5000	0.2500
2	1.0000	1.0000	1.0000	0.1111	0.1111	0.1111	0.3333	0.2000	0.2500	1.0000	0.2500	0.1667
3	1.0000	1.0000	1.0000	0.1250	0.1250	0.1250	0.1667	0.2500	0.2500	1.0000	0.3333	0.2000
4	8.0000	9.0000	8.0000	1.0000	1.0000	1.0000	2.0000	4.0000	5.0000	9.0000	5.0000	3.0000
5	8.0000	9.0000	8.0000	1.0000	1.0000	1.0000	2.0000	4.0000	5.0000	9.0000	5.0000	3.0000
6	8.0000	9.0000	8.0000	1.0000	1.0000	1.0000	3.0000	4.0000	5.0000	9.0000	5.0000	3.0000
7	3.0000	3.0000	6.0000	0.5000	0.5000	0.3333	1.0000	3.0000	3.0000	8.0000	4.0000	2.0000
1A	4.0000	5.0000	4.0000	0.2500	0.2500	0.2500	0.3333	1.0000	1.0000	5.0000	1.0000	1.0000
1-Off	3.0000	4.0000	4.0000	0.2000	0.2000	0.2000	0.3333	1.0000	1.0000	4.0000	1.0000	1.0000
2-Off	1.0000	1.0000	1.0000	0.1111	0.1111	0.1111	0.1250	0.2000	0.2500	1.0000	0.2500	0.1667
3-Off	2.0000	4.0000	3.0000	0.2000	0.2000	0.2000	0.2500	1.0000	1.0000	4.0000	1.0000	0.5000
16	4.0000	6.0000	5.0000	0.3333	0.3333	0.3333	0.5000	1.0000	1.0000	6.0000	2.0000	1.0000
Sum	44.0000	53.0000	50.0000	4.9556	4.9556	4.7889	10.3750	19.9000	23.0833	58.0000	25.3333	15.2833

Table 95. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < *n* < 11.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0227	0.0189	0.0200	0.0252	0.0252	0.0261	0.0321	0.0126	0.0144	0.0172	0.0197	0.0164	0.0209
2	0.0227	0.0189	0.0200	0.0224	0.0224	0.0232	0.0321	0.0101	0.0108	0.0172	0.0099	0.0109	0.0184
3	0.0227	0.0189	0.0200	0.0252	0.0252	0.0261	0.0161	0.0126	0.0108	0.0172	0.0132	0.0131	0.0184
4	0.1818	0.1698	0.1600	0.2018	0.2018	0.2088	0.1928	0.2010	0.2166	0.1552	0.1974	0.1963	0.1903
5	0.1818	0.1698	0.1600	0.2018	0.2018	0.2088	0.1928	0.2010	0.2166	0.1552	0.1974	0.1963	0.1903
6	0.1818	0.1698	0.1600	0.2018	0.2018	0.2088	0.2892	0.2010	0.2166	0.1552	0.1974	0.1963	0.1983
7	0.0682	0.0566	0.1200	0.1009	0.1009	0.0696	0.0964	0.1508	0.1300	0.1379	0.1579	0.1309	0.1100
1A	0.0909	0.0943	0.0800	0.0504	0.0504	0.0522	0.0321	0.0503	0.0433	0.0862	0.0395	0.0654	0.0613
1-Off	0.0682	0.0755	0.0800	0.0404	0.0404	0.0418	0.0321	0.0503	0.0433	0.0690	0.0395	0.0654	0.0538
2-Off	0.0227	0.0189	0.0200	0.0224	0.0224	0.0232	0.0120	0.0101	0.0108	0.0172	0.0099	0.0109	0.0167
3-Off	0.0455	0.0755	0.0600	0.0404	0.0404	0.0418	0.0241	0.0503	0.0433	0.0690	0.0395	0.0327	0.0469
16	0.0909	0.1132	0.1000	0.0673	0.0673	0.0696	0.0482	0.0503	0.0433	0.1034	0.0789	0.0654	0.0748

Table 96. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0209	0.0184	0.0184	0.1903	0.1903	0.1983	0.1100	0.0613	0.0538	0.0167	0.0469	0.0748	1.0000	
1	0.0209	0.0184	0.0184	0.0238	0.0238	0.0248	0.0367	0.0153	0.0179	0.0167	0.0234	0.0187	0.2588	12.3928
2	0.0209	0.0184	0.0184	0.0211	0.0211	0.0220	0.0367	0.0123	0.0135	0.0167	0.0117	0.0125	0.2253	12.2512
3	0.0209	0.0184	0.0184	0.0238	0.0238	0.0248	0.0183	0.0153	0.0135	0.0167	0.0156	0.0150	0.2245	12.1825
4	0.1671	0.1655	0.1474	0.1903	0.1903	0.1983	0.2200	0.2451	0.2690	0.1504	0.2343	0.2245	2.4021	12.6245
5	0.1671	0.1655	0.1474	0.1903	0.1903	0.1983	0.2200	0.2451	0.2690	0.1504	0.2343	0.2245	2.4021	12.6245
6	0.1671	0.1655	0.1474	0.1903	0.1903	0.1983	0.3300	0.2451	0.2690	0.1504	0.2343	0.2245	2.5121	12.6678
7	0.0627	0.0552	0.1105	0.0951	0.0951	0.0661	0.1100	0.1838	0.1614	0.1337	0.1874	0.1496	1.4107	12.8250
1A	0.0835	0.0919	0.0737	0.0476	0.0476	0.0496	0.0367	0.0613	0.0538	0.0836	0.0469	0.0748	0.7509	12.2565
1-Off	0.0627	0.0736	0.0737	0.0381	0.0381	0.0397	0.0367	0.0613	0.0538	0.0669	0.0469	0.0748	0.6659	12.3761
2-Off	0.0209	0.0184	0.0184	0.0211	0.0211	0.0220	0.0137	0.0123	0.0135	0.0167	0.0117	0.0125	0.2024	12.1066
3-Off	0.0418	0.0736	0.0553	0.0381	0.0381	0.0397	0.0275	0.0613	0.0538	0.0669	0.0469	0.0374	0.5801	12.3806
16	0.0835	0.1103	0.0921	0.0634	0.0634	0.0661	0.0550	0.0613	0.0538	0.1003	0.0937	0.0748	0.9178	12.2671

Size of *n*	12.0000
Sum	148.9551
Sum/*n* = λ_{max}	12.4129
CI	0.0375
RI	1.4497
CR	0.0259

Table 97. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	2.0000	0.5000	0.1429	0.1429	0.1429	0.1429	0.2500	0.5000	2.0000	1.0000	0.1667
2	0.5000	1.0000	0.2500	0.1111	0.1111	0.1111	0.1111	0.1667	0.2500	1.0000	0.2500	0.1250
3	2.0000	4.0000	1.0000	0.2000	0.2000	0.2000	0.2000	0.5000	1.0000	4.0000	1.0000	0.2500
4	7.0000	9.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	5.0000	9.0000	5.0000	1.0000
5	7.0000	9.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	5.0000	9.0000	5.0000	1.0000
6	7.0000	9.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	5.0000	9.0000	5.0000	1.0000
7	7.0000	9.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	5.0000	9.0000	5.0000	1.0000
1A	4.0000	6.0000	2.0000	0.3333	0.3333	0.3333	0.3333	1.0000	2.0000	6.0000	2.0000	0.5000
1-Off	2.0000	4.0000	1.0000	0.2000	0.2000	0.2000	0.2000	0.5000	1.0000	4.0000	1.0000	0.2500
2-Off	0.5000	1.0000	0.2500	0.1111	0.1111	0.1111	0.1111	0.1667	0.2500	1.0000	0.2500	0.1250
3-Off	1.0000	4.0000	1.0000	0.2000	0.2000	0.2000	0.2000	0.5000	1.0000	4.0000	1.0000	0.2500
16	6.0000	8.0000	4.0000	1.0000	1.0000	1.0000	1.0000	2.0000	4.0000	8.0000	4.0000	1.0000
Sum	45.0000	66.0000	30.0000	6.2984	6.2984	6.2984	6.2984	17.0833	30.0000	66.0000	30.5000	6.6667

Table 98. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from the LTP at Wind Speed Category VI, $n > 11.1$ m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0222	0.0303	0.0167	0.0227	0.0227	0.0227	0.0227	0.0146	0.0167	0.0303	0.0328	0.0250	0.0233
2	0.0111	0.0152	0.0083	0.0176	0.0176	0.0176	0.0176	0.0098	0.0083	0.0152	0.0082	0.0188	0.0138
3	0.0444	0.0606	0.0333	0.0318	0.0318	0.0318	0.0318	0.0293	0.0333	0.0606	0.0328	0.0375	0.0382
4	0.1556	0.1364	0.1667	0.1588	0.1588	0.1588	0.1588	0.1756	0.1667	0.1364	0.1639	0.1500	0.1572
5	0.1556	0.1364	0.1667	0.1588	0.1588	0.1588	0.1588	0.1756	0.1667	0.1364	0.1639	0.1500	0.1572
6	0.1556	0.1364	0.1667	0.1588	0.1588	0.1588	0.1588	0.1756	0.1667	0.1364	0.1639	0.1500	0.1572
7	0.1556	0.1364	0.1667	0.1588	0.1588	0.1588	0.1588	0.1756	0.1667	0.1364	0.1639	0.1500	0.1572
1A	0.0889	0.0909	0.0667	0.0529	0.0529	0.0529	0.0529	0.0585	0.0667	0.0909	0.0656	0.0750	0.0679
1-Off	0.0444	0.0606	0.0333	0.0318	0.0318	0.0318	0.0318	0.0293	0.0333	0.0606	0.0328	0.0375	0.0382
2-Off	0.0111	0.0152	0.0083	0.0176	0.0176	0.0176	0.0176	0.0098	0.0083	0.0152	0.0082	0.0188	0.0138
3-Off	0.0222	0.0606	0.0333	0.0318	0.0318	0.0318	0.0318	0.0293	0.0333	0.0606	0.0328	0.0375	0.0364
16	0.1333	0.1212	0.1333	0.1588	0.1588	0.1588	0.1588	0.1171	0.1333	0.1212	0.1311	0.1500	0.1396

Table 99. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from the LTP at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0233	0.0138	0.0382	0.1572	0.1572	0.1572	0.1572	0.0679	0.0382	0.0138	0.0364	0.1396	1.0000	
1	0.0233	0.0276	0.0191	0.0225	0.0225	0.0225	0.0225	0.0170	0.0191	0.0276	0.0364	0.0233	0.2831	12.1626
2	0.0116	0.0138	0.0096	0.0175	0.0175	0.0175	0.0175	0.0113	0.0096	0.0138	0.0091	0.0175	0.1660	12.0507
3	0.0466	0.0551	0.0382	0.0314	0.0314	0.0314	0.0314	0.0340	0.0382	0.0551	0.0364	0.0349	0.4643	12.1405
4	0.1629	0.1240	0.1912	0.1572	0.1572	0.1572	0.1572	0.2037	0.1912	0.1240	0.1819	0.1396	1.9474	12.3892
5	0.1629	0.1240	0.1912	0.1572	0.1572	0.1572	0.1572	0.2037	0.1912	0.1240	0.1819	0.1396	1.9474	12.3892
6	0.1629	0.1240	0.1912	0.1572	0.1572	0.1572	0.1572	0.2037	0.1912	0.1240	0.1819	0.1396	1.9474	12.3892
7	0.1629	0.1240	0.1912	0.1572	0.1572	0.1572	0.1572	0.2037	0.1912	0.1240	0.1819	0.1396	1.9474	12.3892
1A	0.0931	0.0827	0.0765	0.0524	0.0524	0.0524	0.0524	0.0679	0.0765	0.0827	0.0728	0.0698	0.8315	12.2453
1-Off	0.0466	0.0551	0.0382	0.0314	0.0314	0.0314	0.0314	0.0340	0.0382	0.0551	0.0364	0.0349	0.4643	12.1405
2-Off	0.0116	0.0138	0.0096	0.0175	0.0175	0.0175	0.0175	0.0113	0.0096	0.0138	0.0091	0.0175	0.1660	12.0507
3-Off	0.0233	0.0551	0.0382	0.0314	0.0314	0.0314	0.0314	0.0340	0.0382	0.0551	0.0364	0.0349	0.4410	12.1187
16	0.1397	0.1102	0.1530	0.1572	0.1572	0.1572	0.1572	0.1358	0.1530	0.1102	0.1456	0.1396	1.7158	12.2870

Size of *n*	12.0000
Sum	146.7528
Sum/*n* = λ_{max}	12.2294
CI	0.0209
RI	1.4497
CR	0.0144

Table 100. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.3333	0.3333	0.1667	0.2000	1.0000	0.1667	1.0000	0.2500	0.2500	0.2500	3.0000
2	3.0000	1.0000	1.0000	0.3333	0.3333	2.0000	0.3333	3.0000	1.0000	1.0000	1.0000	6.0000
3	3.0000	1.0000	1.0000	0.3333	0.3333	2.0000	0.3333	3.0000	1.0000	1.0000	1.0000	6.0000
4	6.0000	3.0000	3.0000	1.0000	1.0000	5.0000	1.0000	6.0000	2.0000	2.0000	2.0000	9.0000
5	5.0000	3.0000	3.0000	1.0000	1.0000	5.0000	1.0000	6.0000	2.0000	2.0000	2.0000	9.0000
6	1.0000	0.5000	0.5000	0.2000	0.2000	1.0000	0.2000	1.0000	0.3333	0.3333	0.3333	4.0000
7	6.0000	3.0000	3.0000	1.0000	1.0000	5.0000	1.0000	6.0000	2.0000	2.0000	2.0000	9.0000
1A	1.0000	0.3333	0.3333	0.1667	0.1667	1.0000	0.1667	1.0000	0.2500	0.2500	0.2500	3.0000
1-Off	4.0000	1.0000	1.0000	0.5000	0.5000	3.0000	0.5000	4.0000	1.0000	1.0000	1.0000	8.0000
2-Off	4.0000	1.0000	1.0000	0.5000	0.5000	3.0000	0.5000	4.0000	1.0000	1.0000	1.0000	8.0000
3-Off	4.0000	1.0000	1.0000	0.5000	0.5000	3.0000	0.5000	4.0000	1.0000	1.0000	1.0000	8.0000
16	0.3333	0.1667	0.1667	0.1111	0.1111	0.2500	0.1111	0.3333	0.1250	0.1250	0.1250	1.0000
Sum	38.3333	15.3333	15.3333	5.8111	5.8444	31.2500	5.8111	39.3333	11.9583	11.9583	11.9583	74.0000

Table 101. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category I, 0.5 < *n* < 2.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0261	0.0217	0.0217	0.0287	0.0342	0.0320	0.0287	0.0254	0.0209	0.0209	0.0209	0.0405	0.0268
2	0.0783	0.0652	0.0652	0.0574	0.0570	0.0640	0.0574	0.0763	0.0836	0.0836	0.0836	0.0811	0.0711
3	0.0783	0.0652	0.0652	0.0574	0.0570	0.0640	0.0574	0.0763	0.0836	0.0836	0.0836	0.0811	0.0711
4	0.1565	0.1957	0.1957	0.1721	0.1711	0.1600	0.1721	0.1525	0.1672	0.1672	0.1672	0.1216	0.1666
5	0.1304	0.1957	0.1957	0.1721	0.1711	0.1600	0.1721	0.1525	0.1672	0.1672	0.1672	0.1216	0.1644
6	0.0261	0.0326	0.0326	0.0344	0.0342	0.0320	0.0344	0.0254	0.0279	0.0279	0.0279	0.0541	0.0325
7	0.1565	0.1957	0.1957	0.1721	0.1711	0.1600	0.1721	0.1525	0.1672	0.1672	0.1672	0.1216	0.1666
1A	0.0261	0.0217	0.0217	0.0287	0.0285	0.0320	0.0287	0.0254	0.0209	0.0209	0.0209	0.0405	0.0263
1-Off	0.1043	0.0652	0.0652	0.0860	0.0856	0.0960	0.0860	0.1017	0.0836	0.0836	0.0836	0.1081	0.0874
2-Off	0.1043	0.0652	0.0652	0.0860	0.0856	0.0960	0.0860	0.1017	0.0836	0.0836	0.0836	0.1081	0.0874
3-Off	0.1043	0.0652	0.0652	0.0860	0.0856	0.0960	0.0860	0.1017	0.0836	0.0836	0.0836	0.1081	0.0874
16	0.0087	0.0109	0.0109	0.0191	0.0190	0.0080	0.0191	0.0085	0.0105	0.0105	0.0105	0.0135	0.0124

Table 102. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category I, 0.5 < n < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0268	0.0711	0.0711	0.1666	0.1644	0.0325	0.1666	0.0263	0.0874	0.0874	0.0874	0.0124	1.0000	
1	0.0268	0.0237	0.0237	0.0278	0.0329	0.0325	0.0278	0.0263	0.0219	0.0219	0.0219	0.0373	0.3242	12.0893
2	0.0805	0.0711	0.0711	0.0555	0.0548	0.0649	0.0555	0.0790	0.0874	0.0874	0.0874	0.0745	0.8692	12.2320
3	0.0805	0.0711	0.0711	0.0555	0.0548	0.0649	0.0555	0.0790	0.0874	0.0874	0.0874	0.0745	0.8692	12.2320
4	0.1609	0.2132	0.2132	0.1666	0.1644	0.1623	0.1666	0.1581	0.1748	0.1748	0.1748	0.1118	2.0415	12.2550
5	0.1341	0.2132	0.2132	0.1666	0.1644	0.1623	0.1666	0.1581	0.1748	0.1748	0.1748	0.1118	2.0147	12.2540
6	0.0268	0.0355	0.0355	0.0333	0.0329	0.0325	0.0333	0.0263	0.0291	0.0291	0.0291	0.0497	0.3933	12.1181
7	0.1609	0.2132	0.2132	0.1666	0.1644	0.1623	0.1666	0.1581	0.1748	0.1748	0.1748	0.1118	2.0415	12.2550
1A	0.0268	0.0237	0.0237	0.0278	0.0274	0.0325	0.0278	0.0263	0.0219	0.0219	0.0219	0.0373	0.3187	12.0994
1-Off	0.1073	0.0711	0.0711	0.0833	0.0822	0.0974	0.0833	0.1054	0.0874	0.0874	0.0874	0.0994	1.0625	12.1539
2-Off	0.1073	0.0711	0.0711	0.0833	0.0822	0.0974	0.0833	0.1054	0.0874	0.0874	0.0874	0.0994	1.0625	12.1539
3-Off	0.1073	0.0711	0.0711	0.0833	0.0822	0.0974	0.0833	0.1054	0.0874	0.0874	0.0874	0.0994	1.0625	12.1539
16	0.0089	0.0118	0.0118	0.0185	0.0183	0.0081	0.0185	0.0088	0.0109	0.0109	0.0109	0.0124	0.1500	12.0786

Size of n	12.0000
Sum	146.0752
Sum/n = λ_{max}	12.1729
CI	0.0157
RI	1.4497
CR	0.0108

Table 103. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category II, $2.1 < n < 3.6$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.2500	0.2500	0.1111	0.1111	0.2500	0.1111	1.0000	0.1429	0.1429	0.1429	0.2000
2	4.0000	1.0000	1.0000	0.2000	0.2000	1.0000	0.2000	4.0000	0.3333	0.3333	0.3333	1.0000
3	4.0000	1.0000	1.0000	0.2000	0.2000	1.0000	0.2000	4.0000	0.3333	0.3333	0.3333	1.0000
4	9.0000	5.0000	5.0000	1.0000	1.0000	5.0000	1.0000	9.0000	2.0000	2.0000	2.0000	4.0000
5	9.0000	5.0000	5.0000	1.0000	1.0000	5.0000	1.0000	9.0000	2.0000	2.0000	2.0000	4.0000
6	4.0000	1.0000	1.0000	0.2000	0.2000	1.0000	0.2000	4.0000	0.3333	0.3333	0.3333	0.5000
7	9.0000	5.0000	5.0000	1.0000	1.0000	5.0000	1.0000	9.0000	2.0000	2.0000	2.0000	4.0000
1A	1.0000	0.2500	0.2500	0.1111	0.1111	0.2500	0.1111	1.0000	0.1429	0.1429	0.1429	0.2000
1-Off	7.0000	3.0000	3.0000	0.5000	0.5000	3.0000	0.5000	7.0000	1.0000	1.0000	1.0000	2.0000
2-Off	7.0000	3.0000	3.0000	0.5000	0.5000	3.0000	0.5000	7.0000	1.0000	1.0000	1.0000	2.0000
3-Off	7.0000	3.0000	3.0000	0.5000	0.5000	3.0000	0.5000	7.0000	1.0000	1.0000	1.0000	2.0000
16	5.0000	1.0000	1.0000	0.2500	0.2500	2.0000	0.2500	5.0000	0.5000	0.5000	0.5000	1.0000
Sum	67.0000	28.5000	28.5000	5.5722	5.5722	29.5000	5.5722	67.0000	10.7857	10.7857	10.7857	21.9000

Table 104. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0149	0.0088	0.0088	0.0199	0.0199	0.0085	0.0199	0.0149	0.0132	0.0132	0.0132	0.0091	0.0137
2	0.0597	0.0351	0.0351	0.0359	0.0359	0.0339	0.0359	0.0597	0.0309	0.0309	0.0309	0.0457	0.0391
3	0.0597	0.0351	0.0351	0.0359	0.0359	0.0339	0.0359	0.0597	0.0309	0.0309	0.0309	0.0457	0.0391
4	0.1343	0.1754	0.1754	0.1795	0.1795	0.1695	0.1795	0.1343	0.1854	0.1854	0.1854	0.1826	0.1722
5	0.1343	0.1754	0.1754	0.1795	0.1795	0.1695	0.1795	0.1343	0.1854	0.1854	0.1854	0.1826	0.1722
6	0.0597	0.0351	0.0351	0.0359	0.0359	0.0339	0.0359	0.0597	0.0309	0.0309	0.0309	0.0228	0.0372
7	0.1343	0.1754	0.1754	0.1795	0.1795	0.1695	0.1795	0.1343	0.1854	0.1854	0.1854	0.1826	0.1722
1A	0.0149	0.0088	0.0088	0.0199	0.0199	0.0085	0.0199	0.0149	0.0132	0.0132	0.0132	0.0091	0.0137
1-Off	0.1045	0.1053	0.1053	0.0897	0.0897	0.1017	0.0897	0.1045	0.0927	0.0927	0.0927	0.0913	0.0967
2-Off	0.1045	0.1053	0.1053	0.0897	0.0897	0.1017	0.0897	0.1045	0.0927	0.0927	0.0927	0.0913	0.0967
3-Off	0.1045	0.1053	0.1053	0.0897	0.0897	0.1017	0.0897	0.1045	0.0927	0.0927	0.0927	0.0913	0.0967
16	0.0746	0.0351	0.0351	0.0449	0.0449	0.0678	0.0449	0.0746	0.0464	0.0464	0.0464	0.0457	0.0505

Table 105. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0137	0.0391	0.0391	0.1722	0.1722	0.0372	0.1722	0.0137	0.0967	0.0967	0.0967	0.0505	1.0000	
1	0.0137	0.0098	0.0098	0.0191	0.0191	0.0093	0.0191	0.0137	0.0138	0.0138	0.0138	0.0101	0.1652	12.0488
2	0.0549	0.0391	0.0391	0.0344	0.0344	0.0372	0.0344	0.0549	0.0322	0.0322	0.0322	0.0505	0.4757	12.1577
3	0.0549	0.0391	0.0391	0.0344	0.0344	0.0372	0.0344	0.0549	0.0322	0.0322	0.0322	0.0505	0.4757	12.1577
4	0.1234	0.1956	0.1956	0.1722	0.1722	0.1861	0.1722	0.1234	0.1933	0.1933	0.1933	0.2022	2.1229	12.3286
5	0.1234	0.1956	0.1956	0.1722	0.1722	0.1861	0.1722	0.1234	0.1933	0.1933	0.1933	0.2022	2.1229	12.3286
6	0.0549	0.0391	0.0391	0.0344	0.0344	0.0372	0.0344	0.0549	0.0322	0.0322	0.0322	0.0253	0.4504	12.1002
7	0.1234	0.1956	0.1956	0.1722	0.1722	0.1861	0.1722	0.1234	0.1933	0.1933	0.1933	0.2022	2.1229	12.3286
1A	0.0137	0.0098	0.0098	0.0191	0.0191	0.0093	0.0191	0.0137	0.0138	0.0138	0.0138	0.0101	0.1652	12.0488
1-Off	0.0960	0.1174	0.1174	0.0861	0.0861	0.1117	0.0861	0.0960	0.0967	0.0967	0.0967	0.1011	1.1878	12.2890
2-Off	0.0960	0.1174	0.1174	0.0861	0.0861	0.1117	0.0861	0.0960	0.0967	0.0967	0.0967	0.1011	1.1878	12.2890
3-Off	0.0960	0.1174	0.1174	0.0861	0.0861	0.1117	0.0861	0.0960	0.0967	0.0967	0.0967	0.1011	1.1878	12.2890
16	0.0686	0.0391	0.0391	0.0430	0.0430	0.0744	0.0430	0.0686	0.0483	0.0483	0.0483	0.0505	0.6145	12.1573

Size of *n*	12.0000
Sum	146.5233
Sum/*n* = λ_{max}	12.2103
CI	0.0191
RI	1.4497
CR	0.0132

Table 106. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category III, $3.6 < n < 5.7$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	0.2500	0.2500	0.1111	0.1111	0.2000	0.1111	1.0000	0.2000	0.2000	0.2000	0.1111
2	4.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.2500
3	4.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.2500
4	9.0000	4.0000	4.0000	1.0000	1.0000	4.0000	1.0000	9.0000	4.0000	4.0000	4.0000	1.0000
5	9.0000	4.0000	4.0000	1.0000	1.0000	4.0000	1.0000	9.0000	4.0000	4.0000	4.0000	1.0000
6	5.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.3333
7	9.0000	4.0000	4.0000	1.0000	1.0000	4.0000	1.0000	9.0000	4.0000	4.0000	4.0000	1.0000
1A	1.0000	0.2000	0.2000	0.1111	0.1111	0.2000	0.1111	1.0000	0.2000	0.2000	0.2000	0.1111
1-Off	5.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.2500
2-Off	5.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.2500
3-Off	5.0000	1.0000	1.0000	0.2500	0.2500	1.0000	0.2500	5.0000	1.0000	1.0000	1.0000	0.2500
16	9.0000	4.0000	4.0000	1.0000	1.0000	3.0000	1.0000	9.0000	4.0000	4.0000	4.0000	1.0000
Sum	66.0000	22.4500	22.4500	5.7222	5.7222	21.4000	5.7222	68.0000	22.4000	22.4000	22.4000	5.8056

Table 107. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0152	0.0111	0.0111	0.0194	0.0194	0.0093	0.0194	0.0147	0.0089	0.0089	0.0089	0.0191	0.0138
2	0.0606	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0431	0.0482
3	0.0606	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0431	0.0482
4	0.1364	0.1782	0.1782	0.1748	0.1748	0.1869	0.1748	0.1324	0.1786	0.1786	0.1786	0.1722	0.1704
5	0.1364	0.1782	0.1782	0.1748	0.1748	0.1869	0.1748	0.1324	0.1786	0.1786	0.1786	0.1722	0.1704
6	0.0758	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0574	0.0506
7	0.1364	0.1782	0.1782	0.1748	0.1748	0.1869	0.1748	0.1324	0.1786	0.1786	0.1786	0.1722	0.1704
1A	0.0152	0.0089	0.0089	0.0194	0.0194	0.0093	0.0194	0.0147	0.0089	0.0089	0.0089	0.0191	0.0134
1-Off	0.0758	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0431	0.0494
2-Off	0.0758	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0431	0.0494
3-Off	0.0758	0.0445	0.0445	0.0437	0.0437	0.0467	0.0437	0.0735	0.0446	0.0446	0.0446	0.0431	0.0494
16	0.1364	0.1782	0.1782	0.1748	0.1748	0.1402	0.1748	0.1324	0.1786	0.1786	0.1786	0.1722	0.1665

Table 108. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0138	0.0482	0.0482	0.1704	0.1704	0.0506	0.1704	0.0134	0.0494	0.0494	0.0494	0.1665	1.0000	
1	0.0138	0.0120	0.0120	0.0189	0.0189	0.0101	0.0189	0.0134	0.0099	0.0099	0.0099	0.0185	0.1664	12.0530
2	0.0552	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0416	0.5870	12.1869
3	0.0552	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0416	0.5870	12.1869
4	0.1242	0.1927	0.1927	0.1704	0.1704	0.2025	0.1704	0.1209	0.1977	0.1977	0.1977	0.1665	2.1037	12.3489
5	0.1242	0.1927	0.1927	0.1704	0.1704	0.2025	0.1704	0.1209	0.1977	0.1977	0.1977	0.1665	2.1037	12.3489
6	0.0690	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0555	0.6147	12.1417
7	0.1242	0.1927	0.1927	0.1704	0.1704	0.2025	0.1704	0.1209	0.1977	0.1977	0.1977	0.1665	2.1037	12.3489
1A	0.0138	0.0096	0.0096	0.0189	0.0189	0.0101	0.0189	0.0134	0.0099	0.0099	0.0099	0.0185	0.1616	12.0275
1-Off	0.0690	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0416	0.6008	12.1549
2-Off	0.0690	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0416	0.6008	12.1549
3-Off	0.0690	0.0482	0.0482	0.0426	0.0426	0.0506	0.0426	0.0672	0.0494	0.0494	0.0494	0.0416	0.6008	12.1549
16	0.1242	0.1927	0.1927	0.1704	0.1704	0.1519	0.1704	0.1209	0.1977	0.1977	0.1977	0.1665	2.0530	12.3337

Size of *n*	12.0000
Sum	146.4410
Sum/*n* = λ_{max}	12.2034
CI	0.0185
RI	1.4497
CR	0.0128

Table 109. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category IV, $5.7 < n < 8.8$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	0.1667	0.1667	0.1667	0.1667	1.0000	3.0000	3.0000	3.0000	0.1667
2	1.0000	1.0000	1.0000	0.2000	0.2000	0.2500	0.2000	1.0000	4.0000	4.0000	4.0000	0.1667
3	1.0000	1.0000	1.0000	0.2000	0.2000	0.2500	0.2000	1.0000	4.0000	4.0000	4.0000	0.2000
4	6.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	6.0000	9.0000	9.0000	9.0000	1.0000
5	6.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	6.0000	9.0000	9.0000	9.0000	1.0000
6	6.0000	4.0000	4.0000	1.0000	1.0000	1.0000	1.0000	5.0000	8.0000	8.0000	8.0000	1.0000
7	6.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	6.0000	9.0000	9.0000	9.0000	1.0000
1A	1.0000	1.0000	1.0000	0.1667	0.1667	0.2000	0.1667	1.0000	3.0000	3.0000	3.0000	0.1667
1-Off	0.3333	0.2500	0.2500	0.1111	0.1111	0.1250	0.1111	0.3333	1.0000	1.0000	1.0000	0.1111
2-Off	0.3333	0.2500	0.2500	0.1111	0.1111	0.1250	0.1111	0.3333	1.0000	1.0000	1.0000	0.1111
3-Off	0.3333	0.2500	0.2500	0.1111	0.1111	0.1250	0.1111	0.3333	1.0000	1.0000	1.0000	0.1111
16	6.0000	6.0000	5.0000	1.0000	1.0000	1.0000	1.0000	6.0000	9.0000	9.0000	9.0000	1.0000
Sum	35.0000	29.7500	28.7500	6.0667	6.0667	6.2417	6.0667	34.0000	61.0000	61.0000	61.0000	6.0333

Table 110. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category IV, $5.7 < n < 8.8$ m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0286	0.0336	0.0348	0.0275	0.0275	0.0267	0.0275	0.0294	0.0492	0.0492	0.0492	0.0276	0.0342
2	0.0286	0.0336	0.0348	0.0330	0.0330	0.0401	0.0330	0.0294	0.0656	0.0656	0.0656	0.0276	0.0408
3	0.0286	0.0336	0.0348	0.0330	0.0330	0.0401	0.0330	0.0294	0.0656	0.0656	0.0656	0.0331	0.0413
4	0.1714	0.1681	0.1739	0.1648	0.1648	0.1602	0.1648	0.1765	0.1475	0.1475	0.1475	0.1657	0.1627
5	0.1714	0.1681	0.1739	0.1648	0.1648	0.1602	0.1648	0.1765	0.1475	0.1475	0.1475	0.1657	0.1627
6	0.1714	0.1345	0.1391	0.1648	0.1648	0.1602	0.1648	0.1471	0.1311	0.1311	0.1311	0.1657	0.1505
7	0.1714	0.1681	0.1739	0.1648	0.1648	0.1602	0.1648	0.1765	0.1475	0.1475	0.1475	0.1657	0.1627
1A	0.0286	0.0336	0.0348	0.0275	0.0275	0.0320	0.0275	0.0294	0.0492	0.0492	0.0492	0.0276	0.0347
1-Off	0.0095	0.0084	0.0087	0.0183	0.0183	0.0200	0.0183	0.0098	0.0164	0.0164	0.0164	0.0184	0.0149
2-Off	0.0095	0.0084	0.0087	0.0183	0.0183	0.0200	0.0183	0.0098	0.0164	0.0164	0.0164	0.0184	0.0149
3-Off	0.0095	0.0084	0.0087	0.0183	0.0183	0.0200	0.0183	0.0098	0.0164	0.0164	0.0164	0.0184	0.0149
16	0.1714	0.2017	0.1739	0.1648	0.1648	0.1602	0.1648	0.1765	0.1475	0.1475	0.1475	0.1657	0.1655

Table 111. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0342	0.0408	0.0413	0.1627	0.1627	0.1505	0.1627	0.0347	0.0149	0.0149	0.0149	0.1655	1.0000	
1	0.0342	0.0408	0.0413	0.0271	0.0271	0.0251	0.0271	0.0347	0.0447	0.0447	0.0447	0.0276	0.4193	12.2511
2	0.0342	0.0408	0.0413	0.0325	0.0325	0.0376	0.0325	0.0347	0.0597	0.0597	0.0597	0.0276	0.4928	12.0770
3	0.0342	0.0408	0.0413	0.0325	0.0325	0.0376	0.0325	0.0347	0.0597	0.0597	0.0597	0.0331	0.4983	12.0760
4	0.2053	0.2040	0.2063	0.1627	0.1627	0.1505	0.1627	0.2080	0.1342	0.1342	0.1342	0.1655	2.0307	12.4778
5	0.2053	0.2040	0.2063	0.1627	0.1627	0.1505	0.1627	0.2080	0.1342	0.1342	0.1342	0.1655	2.0307	12.4778
6	0.2053	0.1632	0.1651	0.1627	0.1627	0.1505	0.1627	0.1733	0.1193	0.1193	0.1193	0.1655	1.8692	12.4203
7	0.2053	0.2040	0.2063	0.1627	0.1627	0.1505	0.1627	0.2080	0.1342	0.1342	0.1342	0.1655	2.0307	12.4778
1A	0.0342	0.0408	0.0413	0.0271	0.0271	0.0301	0.0271	0.0347	0.0447	0.0447	0.0447	0.0276	0.4243	12.2385
1-Off	0.0114	0.0102	0.0103	0.0181	0.0181	0.0188	0.0181	0.0116	0.0149	0.0149	0.0149	0.0184	0.1797	12.0463
2-Off	0.0114	0.0102	0.0103	0.0181	0.0181	0.0188	0.0181	0.0116	0.0149	0.0149	0.0149	0.0184	0.1797	12.0463
3-Off	0.0114	0.0102	0.0103	0.0181	0.0181	0.0188	0.0181	0.0116	0.0149	0.0149	0.0149	0.0184	0.1797	12.0463
16	0.2053	0.2448	0.2063	0.1627	0.1627	0.1505	0.1627	0.2080	0.1342	0.1342	0.1342	0.1655	2.0715	12.5132

Size of *n*	12.0000
Sum	147.1485
Sum/*n* = λ_{max}	12.2624
CI	0.0239
RI	1.4497
CR	0.0165

Table 112. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	2.0000	2.0000	0.3333	0.3333	0.3333	0.3333	1.0000	6.0000	6.0000	6.0000	0.3333
2	0.5000	1.0000	1.0000	0.2000	0.2000	0.2500	0.2000	0.5000	4.0000	4.0000	4.0000	0.2000
3	0.5000	1.0000	1.0000	0.2000	0.2000	0.2500	0.2000	0.5000	4.0000	4.0000	4.0000	0.2000
4	3.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	9.0000	9.0000	9.0000	1.0000
5	3.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	9.0000	9.0000	9.0000	1.0000
6	3.0000	4.0000	4.0000	1.0000	1.0000	1.0000	1.0000	3.0000	9.0000	9.0000	9.0000	1.0000
7	3.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	9.0000	9.0000	9.0000	1.0000
1A	1.0000	2.0000	2.0000	0.3333	0.3333	0.3333	0.3333	1.0000	6.0000	6.0000	6.0000	0.3333
1-Off	0.1667	0.2500	0.2500	0.1111	0.1111	0.1111	0.1111	0.1667	1.0000	1.0000	1.0000	0.1111
2-Off	0.1667	0.2500	0.2500	0.1111	0.1111	0.1111	0.1111	0.1667	1.0000	1.0000	1.0000	0.1111
3-Off	0.1667	0.2500	0.2500	0.1111	0.1111	0.1111	0.1111	0.1667	1.0000	1.0000	1.0000	0.1111
16	3.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	3.0000	9.0000	9.0000	9.0000	1.0000
Sum	18.5000	30.7500	30.7500	6.4000	6.4000	6.5000	6.4000	18.5000	68.0000	68.0000	68.0000	6.4000

Table 113. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category V, 8.8 < n < 11.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0541	0.0650	0.0650	0.0521	0.0521	0.0513	0.0521	0.0541	0.0882	0.0882	0.0882	0.0521	0.0635
2	0.0270	0.0325	0.0325	0.0313	0.0313	0.0385	0.0313	0.0270	0.0588	0.0588	0.0588	0.0313	0.0383
3	0.0270	0.0325	0.0325	0.0313	0.0313	0.0385	0.0313	0.0270	0.0588	0.0588	0.0588	0.0313	0.0383
4	0.1622	0.1626	0.1626	0.1563	0.1563	0.1538	0.1563	0.1622	0.1324	0.1324	0.1324	0.1563	0.1521
5	0.1622	0.1626	0.1626	0.1563	0.1563	0.1538	0.1563	0.1622	0.1324	0.1324	0.1324	0.1563	0.1521
6	0.1622	0.1301	0.1301	0.1563	0.1563	0.1538	0.1563	0.1622	0.1324	0.1324	0.1324	0.1563	0.1467
7	0.1622	0.1626	0.1626	0.1563	0.1563	0.1538	0.1563	0.1622	0.1324	0.1324	0.1324	0.1563	0.1521
1A	0.0541	0.0650	0.0650	0.0521	0.0521	0.0513	0.0521	0.0541	0.0882	0.0882	0.0882	0.0521	0.0635
1-Off	0.0090	0.0081	0.0081	0.0174	0.0174	0.0171	0.0174	0.0090	0.0147	0.0147	0.0147	0.0174	0.0137
2-Off	0.0090	0.0081	0.0081	0.0174	0.0174	0.0171	0.0174	0.0090	0.0147	0.0147	0.0147	0.0174	0.0137
3-Off	0.0090	0.0081	0.0081	0.0174	0.0174	0.0171	0.0174	0.0090	0.0147	0.0147	0.0147	0.0174	0.0137
16	0.1622	0.1626	0.1626	0.1563	0.1563	0.1538	0.1563	0.1622	0.1324	0.1324	0.1324	0.1563	0.1521

Table 114. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0635	0.0383	0.0383	0.1521	0.1521	0.1467	0.1521	0.0635	0.0137	0.0137	0.0137	0.1521	1.0000	
1	0.0635	0.0765	0.0765	0.0507	0.0507	0.0489	0.0507	0.0635	0.0825	0.0825	0.0825	0.0507	0.7792	12.2630
2	0.0318	0.0383	0.0383	0.0304	0.0304	0.0367	0.0304	0.0318	0.0550	0.0550	0.0550	0.0304	0.4634	12.1131
3	0.0318	0.0383	0.0383	0.0304	0.0304	0.0367	0.0304	0.0318	0.0550	0.0550	0.0550	0.0304	0.4634	12.1131
4	0.1906	0.1913	0.1913	0.1521	0.1521	0.1467	0.1521	0.1906	0.1237	0.1237	0.1237	0.1521	1.8901	12.4248
5	0.1906	0.1913	0.1913	0.1521	0.1521	0.1467	0.1521	0.1906	0.1237	0.1237	0.1237	0.1521	1.8901	12.4248
6	0.1906	0.1530	0.1530	0.1521	0.1521	0.1467	0.1521	0.1906	0.1237	0.1237	0.1237	0.1521	1.8136	12.3624
7	0.1906	0.1913	0.1913	0.1521	0.1521	0.1467	0.1521	0.1906	0.1237	0.1237	0.1237	0.1521	1.8901	12.4248
1A	0.0635	0.0765	0.0765	0.0507	0.0507	0.0489	0.0507	0.0635	0.0825	0.0825	0.0825	0.0507	0.7792	12.2630
1-Off	0.0106	0.0096	0.0096	0.0169	0.0169	0.0163	0.0169	0.0106	0.0137	0.0137	0.0137	0.0169	0.1654	12.0375
2-Off	0.0106	0.0096	0.0096	0.0169	0.0169	0.0163	0.0169	0.0106	0.0137	0.0137	0.0137	0.0169	0.1654	12.0375
3-Off	0.0106	0.0096	0.0096	0.0169	0.0169	0.0163	0.0169	0.0106	0.0137	0.0137	0.0137	0.0169	0.1654	12.0375
16	0.1906	0.1913	0.1913	0.1521	0.1521	0.1467	0.1521	0.1906	0.1237	0.1237	0.1237	0.1521	1.8901	12.4248

Size of *n*	12.0000
Sum	146.9261
Sum/*n* = λ_{max}	12.2438
CI	0.0222
RI	1.4497
CR	0.0153

Table 115. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
2	0.5000	1.0000	1.0000	0.2500	0.2500	0.5000	0.2000	0.2500	7.0000	7.0000	7.0000	0.2000
3	0.5000	1.0000	1.0000	0.2500	0.2500	0.5000	0.2000	0.2500	7.0000	7.0000	7.0000	0.2000
4	1.0000	4.0000	4.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
5	1.0000	4.0000	4.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
6	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
7	1.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
1A	1.0000	4.0000	4.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
1-Off	0.1111	0.1429	0.1429	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
2-Off	0.1111	0.1429	0.1429	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
3-Off	0.1111	0.1429	0.1429	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
16	1.0000	5.0000	5.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
Sum	8.3333	28.4286	28.4286	7.8333	7.8333	8.3333	7.7333	7.8333	80.0000	80.0000	80.0000	7.7333

Table 116. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 5-Off at Wind Speed Category VI, n > 11.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1200	0.0704	0.0704	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1133
2	0.0600	0.0352	0.0352	0.0319	0.0319	0.0600	0.0259	0.0319	0.0875	0.0875	0.0875	0.0259	0.0500
3	0.0600	0.0352	0.0352	0.0319	0.0319	0.0600	0.0259	0.0319	0.0875	0.0875	0.0875	0.0259	0.0500
4	0.1200	0.1407	0.1407	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1250
5	0.1200	0.1407	0.1407	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1250
6	0.1200	0.0704	0.0704	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1133
7	0.1200	0.1759	0.1759	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1309
1A	0.1200	0.1407	0.1407	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1250
1-Off	0.0133	0.0050	0.0050	0.0142	0.0142	0.0133	0.0144	0.0142	0.0125	0.0125	0.0125	0.0144	0.0121
2-Off	0.0133	0.0050	0.0050	0.0142	0.0142	0.0133	0.0144	0.0142	0.0125	0.0125	0.0125	0.0144	0.0121
3-Off	0.0133	0.0050	0.0050	0.0142	0.0142	0.0133	0.0144	0.0142	0.0125	0.0125	0.0125	0.0144	0.0121
16	0.1200	0.1759	0.1759	0.1277	0.1277	0.1200	0.1293	0.1277	0.1125	0.1125	0.1125	0.1293	0.1309

Table 117. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 5-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.1133	0.0500	0.0500	0.1250	0.1250	0.1133	0.1309	0.1250	0.0121	0.0121	0.0121	0.1309	1.0000	
1	0.1133	0.1001	0.1001	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.3911	12.2759
2	0.0567	0.0500	0.0500	0.0313	0.0313	0.0567	0.0262	0.0313	0.0849	0.0849	0.0849	0.0262	0.6141	12.2764
3	0.0567	0.0500	0.0500	0.0313	0.0313	0.0567	0.0262	0.0313	0.0849	0.0849	0.0849	0.0262	0.6141	12.2764
4	0.1133	0.2001	0.2001	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.5912	12.7251
5	0.1133	0.2001	0.2001	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.5912	12.7251
6	0.1133	0.1001	0.1001	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.3911	12.2759
7	0.1133	0.2501	0.2501	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.6912	12.9195
1A	0.1133	0.2001	0.2001	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.5912	12.7251
1-Off	0.0126	0.0071	0.0071	0.0139	0.0139	0.0126	0.0145	0.0139	0.0121	0.0121	0.0121	0.0145	0.1466	12.0921
2-Off	0.0126	0.0071	0.0071	0.0139	0.0139	0.0126	0.0145	0.0139	0.0121	0.0121	0.0121	0.0145	0.1466	12.0921
3-Off	0.0126	0.0071	0.0071	0.0139	0.0139	0.0126	0.0145	0.0139	0.0121	0.0121	0.0121	0.0145	0.1466	12.0921
16	0.1133	0.2501	0.2501	0.1250	0.1250	0.1133	0.1309	0.1250	0.1091	0.1091	0.1091	0.1309	1.6912	12.9195

Size of n	12.0000
Sum	149.3950
Sum/n = λ_{max}	12.4496
CI	0.0409
RI	1.4497
CR	0.0282

Table 118. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	0.3333	0.2000	0.2000	1.0000	0.5000	1.0000	4.0000	0.3333	0.3333	1.0000
2	1.0000	1.0000	1.0000	0.3333	0.3333	2.0000	1.0000	2.0000	6.0000	1.0000	1.0000	2.0000
3	3.0000	1.0000	1.0000	0.5000	0.5000	3.0000	1.0000	3.0000	7.0000	1.0000	1.0000	3.0000
4	5.0000	3.0000	2.0000	1.0000	1.0000	5.0000	3.0000	5.0000	9.0000	1.0000	1.0000	4.0000
5	5.0000	3.0000	2.0000	1.0000	1.0000	5.0000	3.0000	5.0000	9.0000	1.0000	1.0000	5.0000
6	1.0000	0.5000	0.3333	0.2000	0.2000	1.0000	0.5000	1.0000	4.0000	0.3333	0.3333	1.0000
7	2.0000	1.0000	1.0000	0.3333	0.3333	2.0000	1.0000	2.0000	6.0000	1.0000	1.0000	2.0000
1A	1.0000	0.5000	0.3333	0.2000	0.2000	1.0000	0.5000	1.0000	4.0000	0.3333	0.3333	1.0000
1-Off	0.2500	0.1667	0.1429	0.1111	0.1111	0.2500	0.1667	0.2500	1.0000	0.1250	0.1111	0.2500
2-Off	3.0000	1.0000	1.0000	1.0000	1.0000	3.0000	1.0000	3.0000	8.0000	1.0000	1.0000	3.0000
3-Off	3.0000	1.0000	1.0000	1.0000	1.0000	3.0000	1.0000	3.0000	9.0000	1.0000	1.0000	3.0000
16	1.0000	0.5000	0.3333	0.2500	0.2000	1.0000	0.5000	1.0000	4.0000	0.3333	0.3333	1.0000
Sum	26.2500	13.6667	10.4762	6.1278	6.0778	27.2500	13.1667	27.2500	71.0000	8.4583	8.4444	26.2500

Table 119. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.0381	0.0732	0.0318	0.0326	0.0329	0.0367	0.0380	0.0367	0.0563	0.0394	0.0395	0.0381	0.0411
2	0.0381	0.0732	0.0955	0.0544	0.0548	0.0734	0.0759	0.0734	0.0845	0.1182	0.1184	0.0762	0.0780
3	0.1143	0.0732	0.0955	0.0816	0.0823	0.1101	0.0759	0.1101	0.0986	0.1182	0.1184	0.1143	0.0994
4	0.1905	0.2195	0.1909	0.1632	0.1645	0.1835	0.2278	0.1835	0.1268	0.1182	0.1184	0.1524	0.1699
5	0.1905	0.2195	0.1909	0.1632	0.1645	0.1835	0.2278	0.1835	0.1268	0.1182	0.1184	0.1905	0.1731
6	0.0381	0.0366	0.0318	0.0326	0.0329	0.0367	0.0380	0.0367	0.0563	0.0394	0.0395	0.0381	0.0381
7	0.0762	0.0732	0.0955	0.0544	0.0548	0.0734	0.0759	0.0734	0.0845	0.1182	0.1184	0.0762	0.0812
1A	0.0381	0.0366	0.0318	0.0326	0.0329	0.0367	0.0380	0.0367	0.0563	0.0394	0.0395	0.0381	0.0381
1-Off	0.0095	0.0122	0.0136	0.0181	0.0183	0.0092	0.0127	0.0092	0.0141	0.0148	0.0132	0.0095	0.0129
2-Off	0.1143	0.0732	0.0955	0.1632	0.1645	0.1101	0.0759	0.1101	0.1127	0.1182	0.1184	0.1143	0.1142
3-Off	0.1143	0.0732	0.0955	0.1632	0.1645	0.1101	0.0759	0.1101	0.1268	0.1182	0.1184	0.1143	0.1154
16	0.0381	0.0366	0.0318	0.0408	0.0329	0.0367	0.0380	0.0367	0.0563	0.0394	0.0395	0.0381	0.0387

Table 120. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0411	0.0780	0.0994	0.1699	0.1731	0.0381	0.0812	0.0381	0.0129	0.1142	0.1154	0.0387	1.0000	
1	0.0411	0.0780	0.0331	0.0340	0.0346	0.0381	0.0406	0.0381	0.0514	0.0381	0.0385	0.0387	0.5043	12.2663
2	0.0411	0.0780	0.0994	0.0566	0.0577	0.0761	0.0812	0.0761	0.0772	0.1142	0.1154	0.0775	0.9505	12.1848
3	0.1233	0.0780	0.0994	0.0850	0.0866	0.1142	0.0812	0.1142	0.0900	0.1142	0.1154	0.1162	1.2176	12.2531
4	0.2055	0.2340	0.1987	0.1699	0.1731	0.1903	0.2435	0.1903	0.1157	0.1142	0.1154	0.1550	2.1058	12.3915
5	0.2055	0.2340	0.1987	0.1699	0.1731	0.1903	0.2435	0.1903	0.1157	0.1142	0.1154	0.1937	2.1445	12.3880
6	0.0411	0.0390	0.0331	0.0340	0.0346	0.0381	0.0406	0.0381	0.0514	0.0381	0.0385	0.0387	0.4653	12.2241
7	0.0822	0.0780	0.0994	0.0566	0.0577	0.0761	0.0812	0.0761	0.0772	0.1142	0.1154	0.0775	0.9916	12.2148
1A	0.0411	0.0390	0.0331	0.0340	0.0346	0.0381	0.0406	0.0381	0.0514	0.0381	0.0385	0.0387	0.4653	12.2241
1-Off	0.0103	0.0130	0.0142	0.0189	0.0192	0.0095	0.0135	0.0095	0.0129	0.0143	0.0128	0.0097	0.1578	12.2697
2-Off	0.1233	0.0780	0.0994	0.1699	0.1731	0.1142	0.0812	0.1142	0.1029	0.1142	0.1154	0.1162	1.4020	12.2766
3-Off	0.1233	0.0780	0.0994	0.1699	0.1731	0.1142	0.0812	0.1142	0.1157	0.1142	0.1154	0.1162	1.4148	12.2632
16	0.0411	0.0390	0.0331	0.0425	0.0346	0.0381	0.0406	0.0381	0.0514	0.0381	0.0385	0.0387	0.4738	12.2289

Size of *n*	12.0000
Sum	147.1851
Sum/*n* = λ_{max}	12.2654
CI	0.0241
RI	1.4497
CR	0.0166

Table 121. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	2.0000	0.5000	0.5000	1.0000	2.0000	1.0000	7.0000	1.0000	3.0000	1.0000
2	1.0000	1.0000	1.0000	0.2500	0.2500	0.5000	1.0000	0.5000	5.0000	0.5000	1.0000	1.0000
3	0.5000	1.0000	1.0000	0.2500	0.3333	1.0000	1.0000	1.0000	7.0000	1.0000	1.0000	1.0000
4	2.0000	4.0000	4.0000	1.0000	1.0000	2.0000	3.0000	2.0000	9.0000	2.0000	4.0000	3.0000
5	2.0000	4.0000	3.0000	1.0000	1.0000	2.0000	3.0000	2.0000	9.0000	2.0000	4.0000	3.0000
6	1.0000	2.0000	1.0000	0.5000	0.5000	1.0000	2.0000	1.0000	7.0000	1.0000	3.0000	1.0000
7	0.5000	1.0000	1.0000	0.3333	0.3333	0.5000	1.0000	2.0000	5.0000	0.5000	1.0000	1.0000
1A	1.0000	2.0000	1.0000	0.5000	0.5000	1.0000	0.5000	1.0000	7.0000	1.0000	2.0000	1.0000
1-Off	0.1429	0.2000	0.1429	0.1111	0.1111	0.1429	0.2000	0.1429	1.0000	0.1429	0.2000	0.1667
2-Off	1.0000	2.0000	1.0000	0.5000	0.5000	1.0000	2.0000	1.0000	7.0000	1.0000	2.0000	1.0000
3-Off	0.3333	1.0000	1.0000	0.2500	0.2500	0.3333	1.0000	0.5000	5.0000	0.5000	1.0000	1.0000
16	1.0000	1.0000	1.0000	0.3333	0.3333	1.0000	1.0000	1.0000	6.0000	1.0000	1.0000	1.0000
Sum	11.4762	20.2000	17.1429	5.5278	5.6111	11.4762	17.7000	13.1429	75.0000	11.6429	23.2000	15.1667

Table 122. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0871	0.0495	0.1167	0.0905	0.0891	0.0871	0.1130	0.0761	0.0933	0.0859	0.1293	0.0659	0.0903
2	0.0871	0.0495	0.0583	0.0452	0.0446	0.0436	0.0565	0.0380	0.0667	0.0429	0.0431	0.0659	0.0535
3	0.0436	0.0495	0.0583	0.0452	0.0594	0.0871	0.0565	0.0761	0.0933	0.0859	0.0431	0.0659	0.0637
4	0.1743	0.1980	0.2333	0.1809	0.1782	0.1743	0.1695	0.1522	0.1200	0.1718	0.1724	0.1978	0.1769
5	0.1743	0.1980	0.1750	0.1809	0.1782	0.1743	0.1695	0.1522	0.1200	0.1718	0.1724	0.1978	0.1720
6	0.0871	0.0990	0.0583	0.0905	0.0891	0.0871	0.1130	0.0761	0.0933	0.0859	0.1293	0.0659	0.0896
7	0.0436	0.0495	0.0583	0.0603	0.0594	0.0436	0.0565	0.1522	0.0667	0.0429	0.0431	0.0659	0.0618
1A	0.0871	0.0990	0.0583	0.0905	0.0891	0.0871	0.0282	0.0761	0.0933	0.0859	0.0862	0.0659	0.0789
1-Off	0.0124	0.0099	0.0083	0.0201	0.0198	0.0124	0.0113	0.0109	0.0133	0.0123	0.0086	0.0110	0.0125
2-Off	0.0871	0.0990	0.0583	0.0905	0.0891	0.0871	0.1130	0.0761	0.0933	0.0859	0.0862	0.0659	0.0860
3-Off	0.0290	0.0495	0.0583	0.0452	0.0446	0.0290	0.0565	0.0380	0.0667	0.0429	0.0431	0.0659	0.0474
16	0.0871	0.0495	0.0583	0.0603	0.0594	0.0871	0.0565	0.0761	0.0800	0.0859	0.0431	0.0659	0.0674

Table 123. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0903	0.0535	0.0637	0.1769	0.1720	0.0896	0.0618	0.0789	0.0125	0.0860	0.0474	0.0674	1.0000	
1	0.0903	0.0535	0.1273	0.0884	0.0860	0.0896	0.1237	0.0789	0.0877	0.0860	0.1422	0.0674	1.1211	12.4154
2	0.0903	0.0535	0.0637	0.0442	0.0430	0.0448	0.0618	0.0395	0.0627	0.0430	0.0474	0.0674	0.6612	12.3688
3	0.0451	0.0535	0.0637	0.0442	0.0573	0.0896	0.0618	0.0789	0.0877	0.0860	0.0474	0.0674	0.7827	12.2935
4	0.1806	0.2138	0.2547	0.1769	0.1720	0.1791	0.1855	0.1578	0.1128	0.1719	0.1896	0.2023	2.1972	12.4211
5	0.1806	0.2138	0.1910	0.1769	0.1720	0.1791	0.1855	0.1578	0.1128	0.1719	0.1896	0.2023	2.1335	12.4020
6	0.0903	0.1069	0.0637	0.0884	0.0860	0.0896	0.1237	0.0789	0.0877	0.0860	0.1422	0.0674	1.1109	12.4034
7	0.0451	0.0535	0.0637	0.0590	0.0573	0.0448	0.0618	0.1578	0.0627	0.0430	0.0474	0.0674	0.7635	12.3480
1A	0.0903	0.1069	0.0637	0.0884	0.0860	0.0896	0.0309	0.0789	0.0877	0.0860	0.0948	0.0674	0.9707	12.3019
1-Off	0.0129	0.0107	0.0091	0.0197	0.0191	0.0128	0.0124	0.0113	0.0125	0.0123	0.0095	0.0112	0.1534	12.2403
2-Off	0.0903	0.1069	0.0637	0.0884	0.0860	0.0896	0.1237	0.0789	0.0877	0.0860	0.0948	0.0674	1.0634	12.3702
3-Off	0.0301	0.0535	0.0637	0.0442	0.0430	0.0299	0.0618	0.0395	0.0627	0.0430	0.0474	0.0674	0.5861	12.3629
16	0.0903	0.0535	0.0637	0.0590	0.0573	0.0896	0.0618	0.0789	0.0752	0.0860	0.0474	0.0674	0.8301	12.3074

Size of n	12.0000
Sum	148.2349
Sum/n = λ_{max}	12.3529
CI	0.0321
RI	1.4497
CR	0.0221

Table 124. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	2.0000	3.0000	1.0000	1.0000	1.0000	2.0000	1.0000	8.0000	2.0000	2.0000	1.0000
2	0.5000	1.0000	1.0000	0.2500	0.2500	0.5000	1.0000	0.5000	6.0000	1.0000	1.0000	0.3333
3	0.3333	1.0000	1.0000	0.2000	0.2000	0.3333	1.0000	0.3333	4.0000	1.0000	1.0000	0.2500
4	1.0000	4.0000	5.0000	1.0000	1.0000	1.0000	3.0000	1.0000	9.0000	3.0000	4.0000	1.0000
5	1.0000	4.0000	5.0000	1.0000	1.0000	1.0000	3.0000	1.0000	9.0000	3.0000	4.0000	1.0000
6	1.0000	2.0000	3.0000	1.0000	1.0000	1.0000	2.0000	1.0000	8.0000	2.0000	2.0000	1.0000
7	0.5000	1.0000	1.0000	0.3333	0.3333	0.5000	1.0000	0.5000	6.0000	1.0000	1.0000	0.3333
1A	1.0000	2.0000	3.0000	1.0000	1.0000	1.0000	2.0000	1.0000	8.0000	2.0000	2.0000	1.0000
1-Off	0.1250	0.1667	0.2500	0.1111	0.1111	0.1250	0.1667	0.1250	1.0000	0.1667	0.2000	0.1111
2-Off	0.5000	1.0000	1.0000	0.3333	0.3333	0.5000	1.0000	0.5000	6.0000	1.0000	2.0000	0.3333
3-Off	0.5000	1.0000	1.0000	0.2500	0.2500	0.5000	1.0000	0.5000	5.0000	0.5000	1.0000	0.3333
16	1.0000	3.0000	4.0000	1.0000	1.0000	1.0000	3.0000	1.0000	9.0000	3.0000	3.0000	1.0000
Sum	8.4583	22.1667	28.2500	7.4778	7.4778	8.4583	20.1667	8.4583	79.0000	19.6667	23.2000	7.6944

Table 125. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category III, $3.6 < n < 5.7$ m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.1182	0.0902	0.1062	0.1337	0.1337	0.1182	0.0992	0.1182	0.1013	0.1017	0.0862	0.1300	0.1114
2	0.0591	0.0451	0.0354	0.0334	0.0334	0.0591	0.0496	0.0591	0.0759	0.0508	0.0431	0.0433	0.0490
3	0.0394	0.0451	0.0354	0.0267	0.0267	0.0394	0.0496	0.0394	0.0506	0.0508	0.0431	0.0325	0.0399
4	0.1182	0.1805	0.1770	0.1337	0.1337	0.1182	0.1488	0.1182	0.1139	0.1525	0.1724	0.1300	0.1414
5	0.1182	0.1805	0.1770	0.1337	0.1337	0.1182	0.1488	0.1182	0.1139	0.1525	0.1724	0.1300	0.1414
6	0.1182	0.0902	0.1062	0.1337	0.1337	0.1182	0.0992	0.1182	0.1013	0.1017	0.0862	0.1300	0.1114
7	0.0591	0.0451	0.0354	0.0446	0.0446	0.0591	0.0496	0.0591	0.0759	0.0508	0.0431	0.0433	0.0508
1A	0.1182	0.0902	0.1062	0.1337	0.1337	0.1182	0.0992	0.1182	0.1013	0.1017	0.0862	0.1300	0.1114
1-Off	0.0148	0.0075	0.0088	0.0149	0.0149	0.0148	0.0083	0.0148	0.0127	0.0085	0.0086	0.0144	0.0119
2-Off	0.0591	0.0451	0.0354	0.0446	0.0446	0.0591	0.0496	0.0591	0.0759	0.0508	0.0862	0.0433	0.0544
3-Off	0.0591	0.0451	0.0354	0.0334	0.0334	0.0591	0.0496	0.0591	0.0633	0.0254	0.0431	0.0433	0.0458
16	0.1182	0.1353	0.1416	0.1337	0.1337	0.1182	0.1488	0.1182	0.1139	0.1525	0.1293	0.1300	0.1311

Table 126. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category III, 3.6 < n < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.1114	0.0490	0.0399	0.1414	0.1414	0.1114	0.0508	0.1114	0.0119	0.0544	0.0458	0.1311	1.0000	
1	0.1114	0.0979	0.1197	0.1414	0.1414	0.1114	0.1016	0.1114	0.0953	0.1088	0.0916	0.1311	1.3631	12.2358
2	0.0557	0.0490	0.0399	0.0354	0.0354	0.0557	0.0508	0.0557	0.0714	0.0544	0.0458	0.0437	0.5929	12.1089
3	0.0371	0.0490	0.0399	0.0283	0.0283	0.0371	0.0508	0.0371	0.0476	0.0544	0.0458	0.0328	0.4883	12.2350
4	0.1114	0.1958	0.1995	0.1414	0.1414	0.1114	0.1525	0.1114	0.1072	0.1632	0.1831	0.1311	1.7496	12.3705
5	0.1114	0.1958	0.1995	0.1414	0.1414	0.1114	0.1525	0.1114	0.1072	0.1632	0.1831	0.1311	1.7496	12.3705
6	0.1114	0.0979	0.1197	0.1414	0.1414	0.1114	0.1016	0.1114	0.0953	0.1088	0.0916	0.1311	1.3631	12.2358
7	0.0557	0.0490	0.0399	0.0471	0.0471	0.0557	0.0508	0.0557	0.0714	0.0544	0.0458	0.0437	0.6164	12.1302
1A	0.1114	0.0979	0.1197	0.1414	0.1414	0.1114	0.1016	0.1114	0.0953	0.1088	0.0916	0.1311	1.3631	12.2358
1-Off	0.0139	0.0082	0.0100	0.0157	0.0157	0.0139	0.0085	0.0139	0.0119	0.0091	0.0092	0.0146	0.1445	12.1374
2-Off	0.0557	0.0490	0.0399	0.0471	0.0471	0.0557	0.0508	0.0557	0.0714	0.0544	0.0916	0.0437	0.6622	12.1709
3-Off	0.0557	0.0490	0.0399	0.0354	0.0354	0.0557	0.0508	0.0557	0.0595	0.0272	0.0458	0.0437	0.5537	12.0940
16	0.1114	0.1469	0.1596	0.1414	0.1414	0.1114	0.1525	0.1114	0.1072	0.1632	0.1374	0.1311	1.6149	12.3154

Size of *n*	12.0000
Sum	146.6401
Sum/*n* = λ_{max}	12.2200
CI	0.0200
RI	1.4497
CR	0.0138

Table 127. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	2.0000	3.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.0000	8.0000	8.0000	1.0000
2	0.5000	1.0000	1.0000	0.5000	0.5000	1.0000	1.0000	1.0000	3.0000	7.0000	7.0000	0.5000
3	0.3333	1.0000	1.0000	0.5000	0.5000	1.0000	1.0000	1.0000	3.0000	7.0000	7.0000	0.5000
4	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	5.0000	9.0000	9.0000	1.0000
5	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	5.0000	9.0000	9.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.0000	8.0000	8.0000	1.0000
7	1.0000	1.0000	1.0000	0.5000	0.5000	1.0000	1.0000	1.0000	3.0000	7.0000	7.0000	0.5000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.0000	8.0000	8.0000	1.0000
1-Off	0.2500	0.3333	0.3333	0.2000	0.2000	0.2500	0.3333	0.2500	1.0000	4.0000	4.0000	0.2000
2-Off	0.1250	0.1429	0.1429	0.1111	0.1111	0.1250	0.1429	0.1250	0.2500	1.0000	1.0000	0.1111
3-Off	0.1250	0.1429	0.1429	0.1111	0.1111	0.1250	0.1429	0.1250	0.2500	1.0000	1.0000	0.1111
16	1.0000	2.0000	2.0000	1.0000	1.0000	1.0000	2.0000	1.0000	5.0000	9.0000	9.0000	1.0000
Sum	8.3333	13.6190	14.6190	7.9222	7.9222	9.5000	12.6190	9.5000	37.5000	78.0000	78.0000	7.9222

Table 128. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1200	0.1469	0.2052	0.1262	0.1262	0.1053	0.0792	0.1053	0.1067	0.1026	0.1026	0.1262	0.1210
2	0.0600	0.0734	0.0684	0.0631	0.0631	0.1053	0.0792	0.1053	0.0800	0.0897	0.0897	0.0631	0.0784
3	0.0400	0.0734	0.0684	0.0631	0.0631	0.1053	0.0792	0.1053	0.0800	0.0897	0.0897	0.0631	0.0767
4	0.1200	0.1469	0.1368	0.1262	0.1262	0.1053	0.1585	0.1053	0.1333	0.1154	0.1154	0.1262	0.1263
5	0.1200	0.1469	0.1368	0.1262	0.1262	0.1053	0.1585	0.1053	0.1333	0.1154	0.1154	0.1262	0.1263
6	0.1200	0.0734	0.0684	0.1262	0.1262	0.1053	0.0792	0.1053	0.1067	0.1026	0.1026	0.1262	0.1035
7	0.1200	0.0734	0.0684	0.0631	0.0631	0.1053	0.0792	0.1053	0.0800	0.0897	0.0897	0.0631	0.0834
1A	0.1200	0.0734	0.0684	0.1262	0.1262	0.1053	0.0792	0.1053	0.1067	0.1026	0.1026	0.1262	0.1035
1-Off	0.0300	0.0245	0.0228	0.0252	0.0252	0.0263	0.0264	0.0263	0.0267	0.0513	0.0513	0.0252	0.0301
2-Off	0.0150	0.0105	0.0098	0.0140	0.0140	0.0132	0.0113	0.0132	0.0067	0.0128	0.0128	0.0140	0.0123
3-Off	0.0150	0.0105	0.0098	0.0140	0.0140	0.0132	0.0113	0.0132	0.0067	0.0128	0.0128	0.0140	0.0123
16	0.1200	0.1469	0.1368	0.1262	0.1262	0.1053	0.1585	0.1053	0.1333	0.1154	0.1154	0.1262	0.1263

Table 129. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.1210	0.0784	0.0767	0.1263	0.1263	0.1035	0.0834	0.1035	0.0301	0.0123	0.0123	0.1263	1.0000	
1	0.1210	0.1567	0.2301	0.1263	0.1263	0.1035	0.0834	0.1035	0.1204	0.0982	0.0982	0.1263	1.4939	12.3438
2	0.0605	0.0784	0.0767	0.0631	0.0631	0.1035	0.0834	0.1035	0.0903	0.0859	0.0859	0.0631	0.9576	12.2185
3	0.0403	0.0784	0.0767	0.0631	0.0631	0.1035	0.0834	0.1035	0.0903	0.0859	0.0859	0.0631	0.9374	12.2210
4	0.1210	0.1567	0.1534	0.1263	0.1263	0.1035	0.1667	0.1035	0.1505	0.1105	0.1105	0.1263	1.5552	12.3150
5	0.1210	0.1567	0.1534	0.1263	0.1263	0.1035	0.1667	0.1035	0.1505	0.1105	0.1105	0.1263	1.5552	12.3150
6	0.1210	0.0784	0.0767	0.1263	0.1263	0.1035	0.0834	0.1035	0.1204	0.0982	0.0982	0.1263	1.2622	12.1939
7	0.1210	0.0784	0.0767	0.0631	0.0631	0.1035	0.0834	0.1035	0.0903	0.0859	0.0859	0.0631	1.0181	12.2115
1A	0.1210	0.0784	0.0767	0.1263	0.1263	0.1035	0.0834	0.1035	0.1204	0.0982	0.0982	0.1263	1.2622	12.1939
1-Off	0.0303	0.0261	0.0256	0.0253	0.0253	0.0259	0.0278	0.0259	0.0301	0.0491	0.0491	0.0253	0.3656	12.1418
2-Off	0.0151	0.0112	0.0110	0.0140	0.0140	0.0129	0.0119	0.0129	0.0075	0.0123	0.0123	0.0140	0.1492	12.1594
3-Off	0.0151	0.0112	0.0110	0.0140	0.0140	0.0129	0.0119	0.0129	0.0075	0.0123	0.0123	0.0140	0.1492	12.1594
16	0.1210	0.1567	0.1534	0.1263	0.1263	0.1035	0.1667	0.1035	0.1505	0.1105	0.1105	0.1263	1.5552	12.3150

Size of *n*	12.0000
Sum	146.7883
Sum/*n* = λ_{max}	12.2324
CI	0.0211
RI	1.4497
CR	0.0146

Table 130. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category V, 8.8 < n < 11.1 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
1-Off	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
2-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	0.5000	0.1111
3-Off	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	2.0000	1.0000	0.1429
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
Sum	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	93.0000	71.5000	10.2540

Table 131. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
2	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
3	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
4	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
5	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
6	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
7	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
1A	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
1-Off	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0070	0.0108	0.0105
3-Off	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0215	0.0140	0.0139	0.0146
16	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975

Table 132. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0105	0.0146	0.0975	1.0000	
1	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
2	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
3	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
4	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
5	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
6	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
7	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
1A	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
1-Off	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0105	0.0073	0.0108	0.1261	12.0012
3-Off	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0210	0.0146	0.0139	0.1749	12.0034
16	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161

Size of *n*	12.0000
Sum	144.1653
Sum/*n* = λ_{max}	12.0138
CI	0.0013
RI	1.4497
CR	0.0009

Table 133. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
1-Off	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
2-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	0.5000	0.1111
3-Off	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	2.0000	1.0000	0.1429
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.0000	1.0000
Sum	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	10.2540	93.0000	71.5000	10.2540

Table 134. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
2	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
3	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
4	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
5	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
6	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
7	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
1A	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
1-Off	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0070	0.0108	0.0105
3-Off	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0215	0.0140	0.0139	0.0146
16	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0968	0.0979	0.0975	0.0975

Table 135. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0105	0.0146	0.0975	1.0000	
1	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
2	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
3	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
4	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
5	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
6	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
7	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
1A	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
1-Off	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0105	0.0073	0.0108	0.1261	12.0012
3-Off	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0139	0.0210	0.0146	0.0139	0.1749	12.0034
16	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0946	0.1020	0.0975	1.1715	12.0161

Size of *n*	12.0000
Sum	144.1653
Sum/*n* = λ_{max}	12.0138
CI	0.0013
RI	1.4497
CR	0.0009

Table 136. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	4.0000	6.0000	4.0000	0.3333	4.0000	1.0000	1.0000	1.0000	1.0000	0.3333
2	1.0000	1.0000	4.0000	6.0000	4.0000	0.3333	4.0000	1.0000	1.0000	1.0000	1.0000	0.3333
3	0.2500	0.2500	1.0000	3.0000	1.0000	0.1667	1.0000	0.2500	0.2000	0.2000	0.3333	0.1667
4	0.1667	0.1667	0.3333	1.0000	0.3333	0.1111	0.3333	0.1667	0.1429	0.1429	0.1667	0.1111
5	0.2500	0.2500	1.0000	3.0000	1.0000	0.1667	1.0000	0.2500	0.2000	0.2000	0.3333	0.1667
6	3.0000	3.0000	6.0000	9.0000	6.0000	1.0000	6.0000	3.0000	2.0000	2.0000	3.0000	1.0000
7	0.2500	0.2500	1.0000	3.0000	1.0000	0.1667	1.0000	0.2500	0.2000	0.2000	0.3333	0.1667
1A	1.0000	1.0000	4.0000	6.0000	4.0000	0.3333	4.0000	1.0000	1.0000	1.0000	1.0000	0.3333
1-Off	1.0000	1.0000	5.0000	7.0000	5.0000	0.5000	5.0000	1.0000	1.0000	1.0000	2.0000	0.5000
2-Off	1.0000	1.0000	5.0000	7.0000	5.0000	0.5000	5.0000	1.0000	1.0000	1.0000	2.0000	0.5000
3-Off	1.0000	1.0000	3.0000	6.0000	3.0000	0.3333	3.0000	1.0000	0.5000	0.5000	1.0000	0.3333
16	3.0000	3.0000	6.0000	9.0000	6.0000	1.0000	6.0000	3.0000	2.0000	2.0000	3.0000	1.0000
Sum	12.9167	12.9167	40.3333	66.0000	40.3333	4.9444	40.3333	12.9167	10.2429	10.2429	15.1667	4.9444

Table 137. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category I, 0.5 < n < 2.1 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0774	0.0774	0.0992	0.0909	0.0992	0.0674	0.0992	0.0774	0.0976	0.0976	0.0659	0.0674	0.0847
2	0.0774	0.0774	0.0992	0.0909	0.0992	0.0674	0.0992	0.0774	0.0976	0.0976	0.0659	0.0674	0.0847
3	0.0194	0.0194	0.0248	0.0455	0.0248	0.0337	0.0248	0.0194	0.0195	0.0195	0.0220	0.0337	0.0255
4	0.0129	0.0129	0.0083	0.0152	0.0083	0.0225	0.0083	0.0129	0.0139	0.0139	0.0110	0.0225	0.0135
5	0.0194	0.0194	0.0248	0.0455	0.0248	0.0337	0.0248	0.0194	0.0195	0.0195	0.0220	0.0337	0.0255
6	0.2323	0.2323	0.1488	0.1364	0.1488	0.2022	0.1488	0.2323	0.1953	0.1953	0.1978	0.2022	0.1894
7	0.0194	0.0194	0.0248	0.0455	0.0248	0.0337	0.0248	0.0194	0.0195	0.0195	0.0220	0.0337	0.0255
1A	0.0774	0.0774	0.0992	0.0909	0.0992	0.0674	0.0992	0.0774	0.0976	0.0976	0.0659	0.0674	0.0847
1-Off	0.0774	0.0774	0.1240	0.1061	0.1240	0.1011	0.1240	0.0774	0.0976	0.0976	0.1319	0.1011	0.1033
2-Off	0.0774	0.0774	0.1240	0.1061	0.1240	0.1011	0.1240	0.0774	0.0976	0.0976	0.1319	0.1011	0.1033
3-Off	0.0774	0.0774	0.0744	0.0909	0.0744	0.0674	0.0744	0.0774	0.0488	0.0488	0.0659	0.0674	0.0704
16	0.2323	0.2323	0.1488	0.1364	0.1488	0.2022	0.1488	0.2323	0.1953	0.1953	0.1978	0.2022	0.1894

Table 138. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.0847	0.0847	0.0255	0.0135	0.0255	0.1894	0.0255	0.0847	0.1033	0.1033	0.0704	0.1894	1.0000	
1	0.0847	0.0847	0.1021	0.0812	0.1021	0.0631	0.1021	0.0847	0.1033	0.1033	0.0704	0.0631	1.0450	12.3338
2	0.0847	0.0847	0.1021	0.0812	0.1021	0.0631	0.1021	0.0847	0.1033	0.1033	0.0704	0.0631	1.0450	12.3338
3	0.0212	0.0212	0.0255	0.0406	0.0255	0.0316	0.0255	0.0212	0.0207	0.0207	0.0235	0.0316	0.3087	12.0904
4	0.0141	0.0141	0.0085	0.0135	0.0085	0.0210	0.0085	0.0141	0.0148	0.0148	0.0117	0.0210	0.1648	12.1680
5	0.0212	0.0212	0.0255	0.0406	0.0255	0.0316	0.0255	0.0212	0.0207	0.0207	0.0235	0.0316	0.3087	12.0904
6	0.2542	0.2542	0.1532	0.1219	0.1532	0.1894	0.1532	0.2542	0.2066	0.2066	0.2112	0.1894	2.3470	12.3948
7	0.0212	0.0212	0.0255	0.0406	0.0255	0.0316	0.0255	0.0212	0.0207	0.0207	0.0235	0.0316	0.3087	12.0904
1A	0.0847	0.0847	0.1021	0.0812	0.1021	0.0631	0.1021	0.0847	0.1033	0.1033	0.0704	0.0631	1.0450	12.3338
1-Off	0.0847	0.0847	0.1276	0.0948	0.1276	0.0947	0.1276	0.0847	0.1033	0.1033	0.1408	0.0947	1.2686	12.2810
2-Off	0.0847	0.0847	0.1276	0.0948	0.1276	0.0947	0.1276	0.0847	0.1033	0.1033	0.1408	0.0947	1.2686	12.2810
3-Off	0.0847	0.0847	0.0766	0.0812	0.0766	0.0631	0.0766	0.0847	0.0516	0.0516	0.0704	0.0631	0.8651	12.2898
16	0.2542	0.2542	0.1532	0.1219	0.1532	0.1894	0.1532	0.2542	0.2066	0.2066	0.2112	0.1894	2.3470	12.3948

Size of n	12.0000
Sum	147.0820
Sum/n = λ_{max}	12.2568
CI	0.0233
RI	1.4497
CR	0.0161

Table 139. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	2.0000	3.0000	2.0000	1.0000	2.0000	1.0000	4.0000	4.0000	9.0000	1.0000
2	1.0000	1.0000	2.0000	3.0000	2.0000	1.0000	2.0000	1.0000	4.0000	4.0000	9.0000	1.0000
3	0.5000	0.5000	1.0000	3.0000	1.0000	0.5000	1.0000	0.5000	2.0000	3.0000	7.0000	0.5000
4	0.3333	0.3333	0.3333	1.0000	0.5000	0.3333	1.0000	0.2500	1.0000	1.0000	6.0000	0.3333
5	0.5000	0.5000	1.0000	2.0000	1.0000	0.5000	1.0000	0.5000	2.0000	3.0000	7.0000	0.5000
6	1.0000	1.0000	2.0000	3.0000	2.0000	1.0000	2.0000	1.0000	4.0000	5.0000	9.0000	1.0000
7	0.5000	0.5000	1.0000	1.0000	1.0000	0.5000	1.0000	0.5000	2.0000	3.0000	7.0000	0.5000
1A	1.0000	1.0000	2.0000	4.0000	2.0000	1.0000	2.0000	1.0000	4.0000	4.0000	9.0000	1.0000
1-Off	0.2500	0.2500	0.5000	1.0000	0.5000	0.2500	0.5000	0.2500	1.0000	1.0000	5.0000	0.2500
2-Off	0.2500	0.2500	0.3333	1.0000	0.3333	0.2000	0.3333	0.2500	1.0000	1.0000	4.0000	0.2000
3-Off	0.1111	0.1111	0.1429	0.1667	0.1429	0.1111	0.1429	0.1111	0.2000	0.2500	1.0000	0.1111
16	1.0000	1.0000	2.0000	3.0000	2.0000	1.0000	2.0000	1.0000	4.0000	5.0000	9.0000	1.0000
Sum	7.4444	7.4444	14.3095	25.1667	14.4762	7.3944	14.9762	7.3611	29.2000	34.2500	82.0000	7.3944

Table 140. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1343	0.1343	0.1398	0.1192	0.1382	0.1352	0.1335	0.1358	0.1370	0.1168	0.1098	0.1352	0.1308
2	0.1343	0.1343	0.1398	0.1192	0.1382	0.1352	0.1335	0.1358	0.1370	0.1168	0.1098	0.1352	0.1308
3	0.0672	0.0672	0.0699	0.1192	0.0691	0.0676	0.0668	0.0679	0.0685	0.0876	0.0854	0.0676	0.0753
4	0.0448	0.0448	0.0233	0.0397	0.0345	0.0451	0.0668	0.0340	0.0342	0.0292	0.0732	0.0451	0.0429
5	0.0672	0.0672	0.0699	0.0795	0.0691	0.0676	0.0668	0.0679	0.0685	0.0876	0.0854	0.0676	0.0720
6	0.1343	0.1343	0.1398	0.1192	0.1382	0.1352	0.1335	0.1358	0.1370	0.1460	0.1098	0.1352	0.1332
7	0.0672	0.0672	0.0699	0.0397	0.0691	0.0676	0.0668	0.0679	0.0685	0.0876	0.0854	0.0676	0.0687
1A	0.1343	0.1343	0.1398	0.1589	0.1382	0.1352	0.1335	0.1358	0.1370	0.1168	0.1098	0.1352	0.1341
1-Off	0.0336	0.0336	0.0349	0.0397	0.0345	0.0338	0.0334	0.0340	0.0342	0.0292	0.0610	0.0338	0.0363
2-Off	0.0336	0.0336	0.0233	0.0397	0.0230	0.0270	0.0223	0.0340	0.0342	0.0292	0.0488	0.0270	0.0313
3-Off	0.0149	0.0149	0.0100	0.0066	0.0099	0.0150	0.0095	0.0151	0.0068	0.0073	0.0122	0.0150	0.0114
16	0.1343	0.1343	0.1398	0.1192	0.1382	0.1352	0.1335	0.1358	0.1370	0.1460	0.1098	0.1352	0.1332

Table 141. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.1308	0.1308	0.0753	0.0429	0.0720	0.1332	0.0687	0.1341	0.0363	0.0313	0.0114	0.1332	1.0000	
1	0.1308	0.1308	0.1506	0.1287	0.1440	0.1332	0.1374	0.1341	0.1453	0.1253	0.1030	0.1332	1.5963	12.2070
2	0.1308	0.1308	0.1506	0.1287	0.1440	0.1332	0.1374	0.1341	0.1453	0.1253	0.1030	0.1332	1.5963	12.2070
3	0.0654	0.0654	0.0753	0.1287	0.0720	0.0666	0.0687	0.0670	0.0726	0.0939	0.0801	0.0666	0.9224	12.2457
4	0.0436	0.0436	0.0251	0.0429	0.0360	0.0444	0.0687	0.0335	0.0363	0.0313	0.0687	0.0444	0.5185	12.0903
5	0.0654	0.0654	0.0753	0.0858	0.0720	0.0666	0.0687	0.0670	0.0726	0.0939	0.0801	0.0666	0.8795	12.2132
6	0.1308	0.1308	0.1506	0.1287	0.1440	0.1332	0.1374	0.1341	0.1453	0.1566	0.1030	0.1332	1.6276	12.2191
7	0.0654	0.0654	0.0753	0.0429	0.0720	0.0666	0.0687	0.0670	0.0726	0.0939	0.0801	0.0666	0.8366	12.1777
1A	0.1308	0.1308	0.1506	0.1715	0.1440	0.1332	0.1374	0.1341	0.1453	0.1253	0.1030	0.1332	1.6391	12.2254
1-Off	0.0327	0.0327	0.0377	0.0429	0.0360	0.0333	0.0344	0.0335	0.0363	0.0313	0.0572	0.0333	0.4413	12.1514
2-Off	0.0327	0.0327	0.0251	0.0429	0.0240	0.0266	0.0229	0.0335	0.0363	0.0313	0.0458	0.0266	0.3805	12.1511
3-Off	0.0145	0.0145	0.0108	0.0071	0.0103	0.0148	0.0098	0.0149	0.0073	0.0078	0.0114	0.0148	0.1381	12.0654
16	0.1308	0.1308	0.1506	0.1287	0.1440	0.1332	0.1374	0.1341	0.1453	0.1566	0.1030	0.1332	1.6276	12.2191

Size of n	12.0000
Sum	146.1726
Sum/n **=** λ_{max}	12.1810
CI	0.0165
RI	1.4497
CR	0.0114

Table 142. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category III, $3.6 < n < 5.7$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	4.0000	9.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	3.0000	9.0000	1.0000
1-Off	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	1.0000	0.5000	4.0000	0.2000
2-Off	0.3333	0.3333	0.3333	0.3333	0.3333	0.2500	0.3333	0.3333	2.0000	1.0000	5.0000	0.2500
3-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.2500	0.2000	1.0000	0.1111
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	4.0000	9.0000	1.0000
Sum	9.6444	9.6444	9.6444	9.6444	9.6444	9.5611	9.6444	9.6444	48.2500	30.7000	91.0000	9.5611

Table 143. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
2	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
3	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
4	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
5	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
6	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.1303	0.0989	0.1046	0.1057
7	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
1A	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.0977	0.0989	0.1046	0.1029
1-Off	0.0207	0.0207	0.0207	0.0207	0.0207	0.0209	0.0207	0.0207	0.0207	0.0163	0.0440	0.0209	0.0223
2-Off	0.0346	0.0346	0.0346	0.0346	0.0346	0.0261	0.0346	0.0346	0.0415	0.0326	0.0549	0.0261	0.0353
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0116	0.0115	0.0115	0.0052	0.0065	0.0110	0.0116	0.0105
16	0.1037	0.1037	0.1037	0.1037	0.1037	0.1046	0.1037	0.1037	0.1036	0.1303	0.0989	0.1046	0.1057

Table 144. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.0223	0.0353	0.0105	0.1057	1.0000	
1	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
2	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
3	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
4	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
5	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
6	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1411	0.0949	0.1057	1.2795	12.1107
7	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
1A	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1058	0.0949	0.1057	1.2442	12.0874
1-Off	0.0206	0.0206	0.0206	0.0206	0.0206	0.0211	0.0206	0.0206	0.0223	0.0176	0.0422	0.0211	0.2685	12.0251
2-Off	0.0343	0.0343	0.0343	0.0343	0.0343	0.0264	0.0343	0.0343	0.0447	0.0353	0.0527	0.0264	0.4257	12.0702
3-Off	0.0114	0.0114	0.0114	0.0114	0.0114	0.0117	0.0114	0.0114	0.0056	0.0071	0.0105	0.0117	0.1267	12.0143
16	0.1029	0.1029	0.1029	0.1029	0.1029	0.1057	0.1029	0.1029	0.1117	0.1411	0.0949	0.1057	1.2795	12.1107

Size of *n*	12.0000
Sum	144.9431
Sum/*n* = λ_{max}	12.0786
CI	0.0071
RI	1.4497
CR	0.0049

Table 145. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
1-Off	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	1.0000	0.3333	3.0000	0.1667
2-Off	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	3.0000	1.0000	6.0000	0.3333
3-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.3333	0.1667	1.0000	0.1111
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
Sum	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	58.3333	28.5000	91.0000	9.6111

Table 146. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
2	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
3	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
4	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
5	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
6	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
7	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
1A	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
1-Off	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0171	0.0117	0.0330	0.0173	0.0182
2-Off	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0514	0.0351	0.0659	0.0347	0.0387
3-Off	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0057	0.0058	0.0110	0.0116	0.0105
16	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036

Table 147. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category IV, $5.7 < n < 8.8$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.0182	0.0387	0.0105	0.1036	1.0000	
1	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
2	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
3	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
4	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
5	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
6	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
7	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
1A	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
1-Off	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0182	0.0129	0.0316	0.0173	0.2181	12.0146
2-Off	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0545	0.0387	0.0633	0.0345	0.4673	12.0711
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0061	0.0065	0.0105	0.0115	0.1267	12.0073
16	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885

Size of *n*	12.0000
Sum	144.8898
Sum/*n* = λ_{max}	12.0742
CI	0.0067
RI	1.4497
CR	0.0046

Table 148. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category V, $8.8 < n < 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
1-Off	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	0.1667	1.0000	0.3333	3.0000	0.1667
2-Off	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	0.3333	3.0000	1.0000	6.0000	0.3333
3-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.3333	0.1667	1.0000	0.1111
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.0000	3.0000	9.0000	1.0000
Sum	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	9.6111	58.3333	28.5000	91.0000	9.6111

Table 149. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category V, $8.8 < n < 11.1$ m/s, with Priority Vectors.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
2	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
3	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
4	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
5	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
6	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
7	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
1A	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036
1-Off	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0171	0.0117	0.0330	0.0173	0.0182
2-Off	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0347	0.0514	0.0351	0.0659	0.0347	0.0387
3-Off	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0057	0.0058	0.0110	0.0116	0.0105
16	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1040	0.1029	0.1053	0.0989	0.1040	0.1036

Table 150. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS / PV
PV	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.0182	0.0387	0.0105	0.1036	1.0000	
1	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
2	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
3	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
4	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
5	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
6	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
7	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
1A	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885
1-Off	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0173	0.0182	0.0129	0.0316	0.0173	0.2181	12.0146
2-Off	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0345	0.0545	0.0387	0.0633	0.0345	0.4673	12.0711
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0061	0.0065	0.0105	0.0115	0.1267	12.0073
16	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1089	0.1161	0.0949	0.1036	1.2526	12.0885

Size of *n*	12.0000
Sum	144.8898
Sum/*n* = λ_{max}	12.0742
CI	0.0067
RI	1.4497
CR	0.0046

Table 151. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
3	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
7	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
1A	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
1-Off	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	1.0000	1.0000	5.0000	0.2000
2-Off	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	1.0000	1.0000	5.0000	0.2000
3-Off	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.2000	0.2000	1.0000	0.1111
16	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.0000	5.0000	9.0000	1.0000
Sum	9.5111	9.5111	9.5111	9.5111	9.5111	9.5111	9.5111	9.5111	47.2000	47.2000	92.0000	9.5111

Table 152. Specimen: Analysis via AHP: Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Normalized Alternatives Pairwise Comparison with respect to Windward Exposure Hours from 4-Off at Wind Speed Category VI, *n* > 11.1 m/s, with Priority Vectors.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
2	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
3	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
4	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
5	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
6	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
7	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
1A	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047
1-Off	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0212	0.0212	0.0543	0.0210	0.0238
2-Off	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0210	0.0212	0.0212	0.0543	0.0210	0.0238
3-Off	0.0117	0.0117	0.0117	0.0117	0.0117	0.0117	0.0117	0.0117	0.0042	0.0042	0.0109	0.0117	0.0104
16	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1051	0.1059	0.1059	0.0978	0.1051	0.1047

Table 153. Specimen: Analysis via AHP: Consistency Check for Derivation of Local Priorities, Alternatives to Sub-Criteria, Level 5 to 4, Alternatives Pairwise Comparison with Respect to Windward Exposure Hours from 4-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS / PV**
PV	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.0238	0.0238	0.0104	0.1047	1.0000	
1	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
2	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
3	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
4	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
5	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
6	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
7	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
1A	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690
1-Off	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0238	0.0238	0.0519	0.0209	0.2879	12.0818
2-Off	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0209	0.0238	0.0238	0.0519	0.0209	0.2879	12.0818
3-Off	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0048	0.0048	0.0104	0.0116	0.1246	12.0081
16	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1192	0.1192	0.0934	0.1047	1.2736	12.1690

Size of *n*	12.0000
Sum	145.6927
Sum/*n* = λ_{max}	12.1411
CI	0.0128
RI	1.4497
CR	0.0088

Table 154. Specimen: Analysis via AHP: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**WINDWARD EXPOSURE**											
GOAL LEVEL Weighting Factor	**0.4469**											
	FROM LTP						**FROM 5-OFF**					
Criteria Level: PV	**0.0654**						**0.1903**					
Sub-Criteria Level:	**0.5 < *n* < 2.1**	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* < 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**	**0.5 < *n* < 2.1**	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* < 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**
Sub-Criteria Level:	0.4523	0.2563	0.1438	0.0796	0.0428	0.0252	0.4523	0.2563	0.1438	0.0796	0.0428	0.0252
Total Criteria PV	0.0296	0.0168	0.0094	0.0052	0.0028	0.0016	0.0860	0.0488	0.0274	0.0151	0.0081	0.0048
Total Global PV	***0.0133***	***0.0075***	***0.0042***	***0.0023***	***0.0013***	***0.0007***	***0.0387***	***0.0219***	***0.0123***	***0.0068***	***0.0037***	***0.0022***
1	0.0819	0.0171	0.0173	0.0164	0.0209	0.0233	0.0268	0.0137	0.0138	0.0342	0.0635	0.1133
2	0.0837	0.1458	0.1085	0.0375	0.0184	0.0138	0.0711	0.0391	0.0482	0.0408	0.0383	0.0500
3	0.0827	0.0400	0.0269	0.0267	0.0184	0.0382	0.0711	0.0391	0.0482	0.0413	0.0383	0.0500
4	0.1055	0.0390	0.0437	0.1719	0.1903	0.1572	0.1666	0.1722	0.1704	0.1627	0.1521	0.1250
5	0.0099	0.0148	0.0318	0.1692	0.1903	0.1572	0.1644	0.1722	0.1704	0.1627	0.1521	0.1250
6	0.0837	0.1541	0.2548	0.2041	0.1983	0.1572	0.0325	0.0372	0.0506	0.1505	0.1467	0.1133
7	0.0865	0.0421	0.0413	0.0898	0.1100	0.1572	0.1666	0.1722	0.1704	0.1627	0.1521	0.1309
1A	0.0865	0.0271	0.0285	0.0344	0.0613	0.0679	0.0263	0.0137	0.0134	0.0347	0.0635	0.1250
1-Off	0.0921	0.1111	0.1184	0.0748	0.0538	0.0382	0.0874	0.0967	0.0494	0.0149	0.0137	0.0121
2-Off	0.0921	0.1541	0.1241	0.0375	0.0167	0.0138	0.0874	0.0967	0.0494	0.0149	0.0137	0.0121
3-Off	0.0977	0.1684	0.1459	0.0897	0.0469	0.0364	0.0874	0.0967	0.0494	0.0149	0.0137	0.0121
16	0.0977	0.0863	0.0588	0.0478	0.0748	0.1396	0.0124	0.0505	0.1665	0.1655	0.1521	0.1309

Table 153 (Cont'd). Specimen: Analysis via AHP: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**WINDWARD EXPOSURE**											
GOAL LEVEL Weighting Factor	**0.4469**											
	FROM 6-OFF						**FROM 4-OFF**					
Criteria Level: PV	**0.0654**						**0.1903**					
Sub-Criteria Level:	**0.5 < *n* < 2.1**	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* < 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**	**0.5 < *n* < 2.1**	**2.1 < *n* < 3.6**	**3.6 < *n* < 5.7**	**5.7 < *n* < 8.8**	**8.8 < *n* < 11.1**	***n* > 11.1**
Sub-Criteria Level:	0.4523	0.2563	0.1438	0.0796	0.0428	0.0252	0.4523	0.2563	0.1438	0.0796	0.0428	0.0252
Total Criteria PV	0.0860	0.0488	0.0274	0.0151	0.0081	0.0048	0.2506	0.1420	0.0797	0.0441	0.0237	0.0140
Total Global PV	***0.0387***	***0.0219***	***0.0123***	***0.0068***	***0.0037***	***0.0022***	***0.1127***	***0.0639***	***0.0358***	***0.0198***	***0.0107***	***0.0063***
1	0.0411	0.0903	0.1114	0.1210	0.0975	0.0975	0.0847	0.1308	0.1029	0.1036	0.1036	0.1047
2	0.0780	0.0535	0.0490	0.0784	0.0975	0.0975	0.0847	0.1308	0.1029	0.1036	0.1036	0.1047
3	0.0994	0.0637	0.0399	0.0767	0.0975	0.0975	0.0255	0.0753	0.1029	0.1036	0.1036	0.1047
4	0.1699	0.1769	0.1414	0.1263	0.0975	0.0975	0.0135	0.0429	0.1029	0.1036	0.1036	0.1047
5	0.1731	0.1720	0.1414	0.1263	0.0975	0.0975	0.0255	0.0720	0.1029	0.1036	0.1036	0.1047
6	0.0381	0.0896	0.1114	0.1035	0.0975	0.0975	0.1894	0.1332	0.1057	0.1036	0.1036	0.1047
7	0.0812	0.0618	0.0508	0.0834	0.0975	0.0975	0.0255	0.0687	0.1029	0.1036	0.1036	0.1047
1A	0.0381	0.0789	0.1114	0.1035	0.0975	0.0975	0.0847	0.1341	0.1029	0.1036	0.1036	0.1047
1-Off	0.0129	0.0125	0.0119	0.0301	0.0975	0.0975	0.1033	0.0363	0.0223	0.0182	0.0182	0.0238
2-Off	0.1142	0.0860	0.0544	0.0123	0.0105	0.0105	0.1033	0.0313	0.0353	0.0387	0.0387	0.0238
3-Off	0.1154	0.0474	0.0458	0.0123	0.0146	0.0146	0.0704	0.0114	0.0105	0.0105	0.0105	0.0104
16	0.0387	0.0674	0.1311	0.1263	0.0975	0.0975	0.1894	0.1332	0.1057	0.1036	0.1036	0.1047

Table 153 (Cont'd). Specimen: Analysis via AHP: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**RELATIVE DISTANCE**				$C_{Rn\text{-}222}$	**ELEVATION**	***GLOBAL PRIORITY***
GOAL LEVEL Weighting Factor	**0.3346**				**0.0416**	**0.1743**	
	FROM LTP	**FROM 5-OFF**	**FROM 6-OFF**	**FROM 4-OFF**			
Total Criteria PV	0.4231	0.2272	0.2272	0.1225			
Total Global PV	***0.1416***	***0.0760***	***0.0760***	***0.0410***	***0.0416***	***0.1743***	
1	0.0248	0.0336	0.0483	0.0483	0.0471	0.0469	***0.0572***
2	0.0280	0.0574	0.0483	0.0483	0.0421	0.0469	***0.0627***
3	0.0360	0.0986	0.0951	0.0951	0.0529	0.0838	***0.0689***
4	0.0297	0.1729	0.0467	0.0467	0.0350	0.0440	***0.0742***
5	0.0265	0.1068	0.0478	0.0478	0.0394	0.0440	***0.0707***
6	0.0293	0.0599	0.0478	0.0478	0.0913	0.0440	***0.0780***
7	0.0287	0.1566	0.0478	0.0478	0.1710	0.0440	***0.0737***
1A	0.0354	0.0234	0.0551	0.0551	0.3408	0.0606	***0.0733***
1-Off	0.1392	0.0349	0.4176	0.4176	0.0623	0.4256	***0.1743***
2-Off	0.2059	0.0673	0.0594	0.0594	0.0376	0.0800	***0.0894***
3-Off	0.2772	0.1749	0.0420	0.0420	0.0333	0.0400	***0.0912***
16	0.1392	0.0136	0.0442	0.0442	0.0472	0.0400	***0.0864***

Table 155. Specimen: Analysis via AHP: Summary of Global Priorities.

Decision Problem Alternative	Aggregated Global Priority
Location 1	0.0572
Location 2	0.0627
Location 3	0.0689
Location 4	0.0742
Location 5	0.0707
Location 6	0.0780
Location 7	0.0737
Location 1A	0.0733
Location 1-Off	**0.1743**
Location 2-Off	0.0894
Location 3-Off	0.0912
Location 16	0.0864

As indicated in Table 155 above, the AHP analysis exercise has shown Location 1-Off to be the decision problem alternative with the highest global priority. That is, according to priorities and pairwise comparisons made throughout the exercise, Location 1-Off represents the most rational choice to designate as the geographically appropriate location that indicates the relative natural background value for radon in air.

As a follow-up measure to any AHP analysis, a sensitivity analysis is generally performed. As was done for the MAUT analysis, the sensitivity analysis for the AHP model is subjected to the same what-if scenarios. The effects of those deliberate manipulations on the outcome (*i.e.,* the alternatives ranking) are provided in Table 156.

Table 156. Sensitivity Analysis for Initial AHP Model Run.

	As-Is				**What-If Scenario I**			
	What Changed? Nothing.				**What Changed? *All Criteria PV Weights Equalized.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
C_{Rn-222}	0.0416	1st	Loc. 1-Off	0.1743	0.0333	1st	Loc. 4	0.1163
Distance, LTP	0.1416	2nd	Loc. 3-Off	0.0912	0.0333	2nd	Loc. 6	0.1092
Distance, 5-Off	0.0760	3rd	Loc. 2-Off	0.0894	0.0333	3rd	Loc. 5	0.1091
Distance, 6-Off	0.0760	4th	Loc. 16	0.0864	0.0333	4th	Loc. 16	0.1023
Distance, 4-Off	0.0410	5th	Loc. 2-Off	0.0780	0.0333	5th	Loc. 7	0.0981
Elevation	0.1743	6th	Loc. 6	0.0742	0.0333	6th	Loc. 1A	0.0811
W.E., LTP, *n*-Cat I	0.0133	7th	Loc. 4	0.0737	0.0333	7th	Loc. 2	0.0713
W.E., LTP, *n*-Cat II	0.0075	8th	Loc. 7	0.0733	0.0333	8th	Loc. 1-Ogg	0.0652
W.E., LTP, *n*-Cat III	0.0042	9th	Loc. 1A	0.0707	0.0333	9th	Loc. 3	0.0640
W.E., LTP, *n*-Cat IV	0.0023	10th	Loc. 3	0.0689	0.0333	10th	Loc. 1	0.0639
W.E., LTP, *n*-Cat V	0.0013	11th	Loc. 2	0.0627	0.0333	11th	Loc. 3-Off	0.0631
W.E., LTP, *n*-Cat VI	0.0007	12th	Loc. 1	0.0572	0.0333	12th	Loc. 2-Off	0.0563
W.E., 5-Off, *n*-Cat I	0.0387				0.0333			
W.E., 5-Off, *n*-Cat II	0.0219				0.0333			
W.E., 5-Off, *n*-Cat III	0.0123				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0068				0.0333			
W.E., 5-Off, *n*-Cat V	0.0037				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0022				0.0333			
W.E., 6-Off, *n*-Cat I	0.0387				0.0333			
W.E., 6-Off, *n*-Cat II	0.0219				0.0333			
W.E., 6-Off, *n*-Cat III	0.0123				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0068				0.0333			
W.E., 6-Off, *n*-Cat V	0.0037				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0022				0.0333			
W.E., 4-Off, *n*-Cat I	0.1127				0.0333			
W.E., 4-Off, *n*-Cat II	0.0639				0.0333			
W.E., 4-Off, *n*-Cat III	0.0358				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0198				0.0333			
W.E., 4-Off, *n*-Cat V	0.0107				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0063				0.0333			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

Criteria	What-If Scenario II — What Changed? *All Wind-Related PV Weights Reduced 10% from Original "As-Is" Values.*				What-If Scenario III — What Changed? *All Wind-Related PV Weights Reduced 20% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
	Criteria PV Weight	Rank	Alternative	Aggregated Global Priority	Criteria PV Weight	Rank	Alternative	Aggregated Global Priority
$C_{Rn\text{-}222}$	0.0435	1st	Loc. 1-Off	0.1272	0.0457	1st	Loc. 1-Off	0.1305
Distance, LTP	0.1482	2nd	Loc. 3-Off	0.0990	0.1556	2nd	Loc. 3-Off	0.1009
Distance, 5-Off	0.0796	3rd	Loc. 16	0.0972	0.0835	3rd	Loc. 16	0.0965
Distance, 6-Off	0.0796	4th	Loc. 4	0.0892	0.0835	4th	Loc. 4	0.0889
Distance, 4-Off	0.0429	5th	Loc. 6	0.0849	0.0450	5th	Loc. 6	0.0837
Elevation	0.1825	6th	Loc. 5	0.0809	0.1915	6th	Loc. 2-Off	0.0806
W.E., LTP, *n*-Cat I	0.0125	7th	Loc. 2-Off	0.0803	0.0117	7th	Loc. 5	0.0802
W.E., LTP, *n*-Cat II	0.0071	8th	Loc. 7	0.0778	0.0066	8th	Loc. 7	0.0776
W.E., LTP, *n*-Cat III	0.0040	9th	Loc. 1A	0.0763	0.0037	9th	Loc. 1A	0.0760
W.E., LTP, *n*-Cat IV	0.0022	10th	Loc. 3	0.0649	0.0021	10th	Loc. 3	0.0649
W.E., LTP, *n*-Cat V	0.0012	11th	Loc. 2	0.0638	0.0011	11th	Loc. 2	0.0624
W.E., LTP, *n*-Cat VI	0.0007	12th	Loc. 1	0.0587	0.0007	12th	Loc. 1	0.0576
W.E., 5-Off, *n*-Cat I	0.0365				0.0340			
W.E., 5-Off, *n*-Cat II	0.0207				0.0193			
W.E., 5-Off, *n*-Cat III	0.0116				0.0108			
W.E., 5-Off, *n*-Cat IV	0.0064				0.0060			
W.E., 5-Off, *n*-Cat V	0.0035				0.0032			
W.E., 5-Off, *n*-Cat VI	0.0020				0.0019			
W.E., 6-Off, *n*-Cat I	0.0365				0.0340			
W.E., 6-Off, *n*-Cat II	0.0207				0.0193			
W.E., 6-Off, *n*-Cat III	0.0116				0.0108			
W.E., 6-Off, *n*-Cat IV	0.0064				0.0060			
W.E., 6-Off, *n*-Cat V	0.0035				0.0032			
W.E., 6-Off, *n*-Cat VI	0.0020				0.0019			
W.E., 4-Off, *n*-Cat I	0.1062				0.0990			
W.E., 4-Off, *n*-Cat II	0.0602				0.0561			
W.E., 4-Off, *n*-Cat III	0.0338				0.0315			
W.E., 4-Off, *n*-Cat IV	0.0187				0.0174			
W.E., 4-Off, *n*-Cat V	0.0101				0.0094			
W.E., 4-Off, *n*-Cat VI	0.0059				0.0055			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

	What-If Scenario IV				What-If Scenario V			
	What Changed? *All Wind-Related PV Weights Reduced 50% from Original "As-Is" Values.*				What Changed? *All Distance-Related PV Weights Reduced 10% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0536	1st	Loc. 1-Off	0.1431	0.0430	1st	Loc. 1-Off	0.1257
Distance, LTP	0.1826	2nd	Loc. 3-Off	0.1082	0.1318	2nd	Loc. 16	0.0977
Distance, 5-Off	0.0981	3rd	Loc. 16	0.0939	0.0708	3rd	Loc. 3-Off	0.0948
Distance, 6-Off	0.0981	4th	Loc. 4	0.0881	0.0708	4th	Loc. 4	0.0887
Distance, 4-Off	0.0529	5th	Loc. 2-Off	0.0821	0.0382	5th	Loc. 6	0.0862
Elevation	0.2248	6th	Loc. 6	0.0791	0.1803	6th	Loc. 5	0.0814
W.E., LTP, *n*-Cat I	0.0086	7th	Loc. 5	0.0776	0.0137	7th	Loc. 2-Off	0.0790
W.E., LTP, *n*-Cat II	0.0049	8th	Loc. 7	0.0769	0.0078	8th	Loc. 1A	0.0778
W.E., LTP, *n*-Cat III	0.0027	9th	Loc. 1A	0.0750	0.0044	9th	Loc. 7	0.0776
W.E., LTP, *n*-Cat IV	0.0015	10th	Loc. 3	0.0650	0.0024	10th	Loc. 2	0.0657
W.E., LTP, *n*-Cat V	0.0008	11th	Loc. 2	0.0575	0.0013	11th	Loc. 3	0.0650
W.E., LTP, *n*-Cat VI	0.0005	12th	Loc. 1	0.0536	0.0008	12th	Loc. 1	0.0604
W.E., 5-Off, *n*-Cat I	0.0250				0.0400			
W.E., 5-Off, *n*-Cat II	0.0141				0.0227			
W.E., 5-Off, *n*-Cat III	0.0079				0.0127			
W.E., 5-Off, *n*-Cat IV	0.0044				0.0070			
W.E., 5-Off, *n*-Cat V	0.0024				0.0038			
W.E., 5-Off, *n*-Cat VI	0.0014				0.0022			
W.E., 6-Off, *n*-Cat I	0.0250				0.0400			
W.E., 6-Off, *n*-Cat II	0.0141				0.0227			
W.E., 6-Off, *n*-Cat III	0.0079				0.0127			
W.E., 6-Off, *n*-Cat IV	0.0044				0.0070			
W.E., 6-Off, *n*-Cat V	0.0024				0.0038			
W.E., 6-Off, *n*-Cat VI	0.0014				0.0022			
W.E., 4-Off, *n*-Cat I	0.0727				0.1166			
W.E., 4-Off, *n*-Cat II	0.0412				0.0661			
W.E., 4-Off, *n*-Cat III	0.0231				0.0371			
W.E., 4-Off, *n*-Cat IV	0.0128				0.0205			
W.E., 4-Off, *n*-Cat V	0.0069				0.0110			
W.E., 4-Off, *n*-Cat VI	0.0040				0.0065			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

Criteria	What-If Scenario VI What Changed? *All Distance-Related PV Weights Reduced 20% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking Rank	Alternative	Aggregated Global Priority	What-If Scenario VII What Changed? *All Distance-Related PV Weights Reduced 50% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking Rank	Alternative	Aggregated Global Priority
$C_{Rn\text{-}222}$	0.0445	1st	Loc. 1-Off	0.1274	0.0499	1st	Loc. 1-Off	0.1335
Distance, LTP	0.1214	2nd	Loc. 16	0.0975	0.0850	2nd	Loc. 16	0.0970
Distance, 5-Off	0.0652	3rd	Loc. 3-Off	0.0923	0.0456	3rd	Loc. 6	0.0872
Distance, 6-Off	0.0652	4th	Loc. 4	0.0880	0.0456	4th	Loc. 4	0.0855
Distance, 4-Off	0.0351	5th	Loc. 6	0.0865	0.0246	5th	Loc. 1A	0.0839
Elevation	0.1868	6th	Loc. 5	0.0813	0.2093	6th	Loc. 3-Off	0.0834
W.E., LTP, *n*-Cat I	0.0142	7th	Loc. 1A	0.0791	0.0160	7th	Loc. 5	0.0809
W.E., LTP, *n*-Cat II	0.0081	8th	Loc. 2-Off	0.0780	0.0090	8th	Loc. 7	0.0760
W.E., LTP, *n*-Cat III	0.0045	9th	Loc. 7	0.0772	0.0051	9th	Loc. 2-Off	0.0746
W.E., LTP, *n*-Cat IV	0.0025	10th	Loc. 2	0.0664	0.0028	10th	Loc. 2	0.0689
W.E., LTP, *n*-Cat V	0.0013	11th	Loc. 3	0.0651	0.0015	11th	Loc. 3	0.0656
W.E., LTP, *n*-Cat VI	0.0008	12th	Loc. 1	0.0611	0.0009	12th	Loc. 1	0.0635
W.E., 5-Off, *n*-Cat I	0.0415				0.0465			
W.E., 5-Off, *n*-Cat II	0.0235				0.0263			
W.E., 5-Off, *n*-Cat III	0.0132				0.0148			
W.E., 5-Off, *n*-Cat IV	0.0073				0.0082			
W.E., 5-Off, *n*-Cat V	0.0039				0.0044			
W.E., 5-Off, *n*-Cat VI	0.0023				0.0026			
W.E., 6-Off, *n*-Cat I	0.0415				0.0465			
W.E., 6-Off, *n*-Cat II	0.0235				0.0263			
W.E., 6-Off, *n*-Cat III	0.0132				0.0148			
W.E., 6-Off, *n*-Cat IV	0.0073				0.0082			
W.E., 6-Off, *n*-Cat V	0.0039				0.0044			
W.E., 6-Off, *n*-Cat VI	0.0023				0.0026			
W.E., 4-Off, *n*-Cat I	0.1207				0.1353			
W.E., 4-Off, *n*-Cat II	0.0684				0.0767			
W.E., 4-Off, *n*-Cat III	0.0384				0.0430			
W.E., 4-Off, *n*-Cat IV	0.0212				0.0238			
W.E., 4-Off, *n*-Cat V	0.0114				0.0128			
W.E., 4-Off, *n*-Cat VI	0.0067				0.0075			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? ***Elevation PV Weights Reduced 10% from Original "As-Is" Values.***				**What Changed?** ***Elevation PV Weights Reduced 20% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0423	1st	Loc. 1-Off	0.1192	0.0431	1st	Loc. 1-Off	0.1142
Distance, LTP	0.1441	2nd	Loc. 16	0.0985	0.1467	2nd	Loc. 16	0.0991
Distance, 5-Off	0.0774	3rd	Loc. 3-Off	0.0976	0.0788	3rd	Loc. 3-Off	0.0980
Distance, 6-Off	0.0774	4th	Loc. 4	0.0901	0.0788	4th	Loc. 4	0.0909
Distance, 4-Off	0.0417	5th	Loc. 6	0.0867	0.0425	5th	Loc. 6	0.0874
Elevation	0.1596	6th	Loc. 5	0.0821	0.1445	6th	Loc. 5	0.0828
W.E., LTP, *n*-Cat I	0.0135	7th	Loc. 2-Off	0.0804	0.0138	7th	Loc. 2-Off	0.0809
W.E., LTP, *n*-Cat II	0.0077	8th	Loc. 7	0.0784	0.0078	8th	Loc. 7	0.0788
W.E., LTP, *n*-Cat III	0.0043	9th	Loc. 1A	0.0770	0.0044	9th	Loc. 1A	0.0775
W.E., LTP, *n*-Cat IV	0.0024	10th	Loc. 2	0.0655	0.0024	10th	Loc. 2	0.0660
W.E., LTP, *n*-Cat V	0.0013	11th	Loc. 3	0.0645	0.0013	11th	Loc. 3	0.0642
W.E., LTP, *n*-Cat VI	0.0008	12th	Loc. 1	0.0600	0.0008	12th	Loc. 1	0.0603
W.E., 5-Off, *n*-Cat I	0.0394				0.0401			
W.E., 5-Off, *n*-Cat II	0.0223				0.0227			
W.E., 5-Off, *n*-Cat III	0.0125				0.0127			
W.E., 5-Off, *n*-Cat IV	0.0069				0.0071			
W.E., 5-Off, *n*-Cat V	0.0037				0.0038			
W.E., 5-Off, *n*-Cat VI	0.0022				0.0022			
W.E., 6-Off, *n*-Cat I	0.0394				0.0401			
W.E., 6-Off, *n*-Cat II	0.0223				0.0227			
W.E., 6-Off, *n*-Cat III	0.0125				0.0127			
W.E., 6-Off, *n*-Cat IV	0.0069				0.0071			
W.E., 6-Off, *n*-Cat V	0.0037				0.0038			
W.E., 6-Off, *n*-Cat VI	0.0022				0.0022			
W.E., 4-Off, *n*-Cat I	0.1147				0.1167			
W.E., 4-Off, *n*-Cat II	0.0650				0.0662			
W.E., 4-Off, *n*-Cat III	0.0365				0.0371			
W.E., 4-Off, *n*-Cat IV	0.0202				0.0205			
W.E., 4-Off, *n*-Cat V	0.0109				0.0111			
W.E., 4-Off, *n*-Cat VI	0.0064				0.0065			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

	What-If Scenario X				**What-If Scenario XI**			
	What Changed? ***Elevation PV Weights Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***Measured $C_{Rn\text{-}222}$ PV Weights Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0455	1st	Loc. 16	0.1011	0.0376	1st	Loc. 1-Off	0.1243
Distance, LTP	0.1551	2nd	Loc. 3-Off	0.0994	0.1422	2nd	Loc. 16	0.0980
Distance, 5-Off	0.0833	3rd	Loc. 1-Off	0.0979	0.0763	3rd	Loc. 3-Off	0.0973
Distance, 6-Off	0.0833	4th	Loc. 4	0.0935	0.0763	4th	Loc. 4	0.0895
Distance, 4-Off	0.0449	5th	Loc. 6	0.0896	0.0412	5th	Loc. 6	0.0863
Elevation	0.0955	6th	Loc. 5	0.0849	0.1750	6th	Loc. 5	0.0816
W.E., LTP, *n*-Cat I	0.0146	7th	Loc. 2-Off	0.0824	0.0133	7th	Loc. 2-Off	0.0800
W.E., LTP, *n*-Cat II	0.0083	8th	Loc. 7	0.0802	0.0076	8th	Loc. 7	0.0780
W.E., LTP, *n*-Cat III	0.0046	9th	Loc. 1A	0.0790	0.0042	9th	Loc. 1A	0.0751
W.E., LTP, *n*-Cat IV	0.0026	10th	Loc. 2	0.0676	0.0023	10th	Loc. 2	0.0651
W.E., LTP, *n*-Cat V	0.0014	11th	Loc. 3	0.0632	0.0013	11th	Loc. 3	0.0650
W.E., LTP, *n*-Cat VI	0.0008	12th	Loc. 1	0.0611	0.0007	12th	Loc. 1	0.0598
W.E., 5-Off, *n*-Cat I	0.0424				0.0388			
W.E., 5-Off, *n*-Cat II	0.0240				0.0220			
W.E., 5-Off, *n*-Cat III	0.0135				0.0124			
W.E., 5-Off, *n*-Cat IV	0.0075				0.0068			
W.E., 5-Off, *n*-Cat V	0.0040				0.0037			
W.E., 5-Off, *n*-Cat VI	0.0024				0.0022			
W.E., 6-Off, *n*-Cat I	0.0424				0.0388			
W.E., 6-Off, *n*-Cat II	0.0240				0.0220			
W.E., 6-Off, *n*-Cat III	0.0135				0.0124			
W.E., 6-Off, *n*-Cat IV	0.0075				0.0068			
W.E., 6-Off, *n*-Cat V	0.0040				0.0037			
W.E., 6-Off, *n*-Cat VI	0.0024				0.0022			
W.E., 4-Off, *n*-Cat I	0.1234				0.1131			
W.E., 4-Off, *n*-Cat II	0.0700				0.0641			
W.E., 4-Off, *n*-Cat III	0.0393				0.0360			
W.E., 4-Off, *n*-Cat IV	0.0217				0.0199			
W.E., 4-Off, *n*-Cat V	0.0117				0.0107			
W.E., 4-Off, *n*-Cat VI	0.0069				0.0063			

Table 155 (Cont'd). Sensitivity Analysis for Initial AHP Model Run.

	What-If Scenario XII				**What-If Scenario XIII**			
	What Changed? ***Measured $C_{Rn\text{-}222}$ PV Weights Reduced 20% from Original "As-Is" Values.***				**What Changed?** ***Measured $C_{Rn\text{-}222}$ PV Weights Reduced 50% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0335	1st	Loc. 1-Off	0.1246	0.0212	1st	Loc. 1-Off	0.1255
Distance, LTP	0.1428	2nd	Loc. 3	0.0982	0.1446	2nd	Loc. 16	0.0987
Distance, 5-Off	0.0766	3rd	Loc. 2	0.0975	0.0776	3rd	Loc. 3-Off	0.0980
Distance, 6-Off	0.0766	4th	Loc. 16	0.0896	0.0776	4th	Loc. 4	0.0899
Distance, 4-Off	0.0413	5th	Loc. 3-Off	0.0865	0.0419	5th	Loc. 6	0.0872
Elevation	0.1757	6th	Loc. 4	0.0817	0.1780	6th	Loc. 5	0.0820
W.E., LTP, *n*-Cat I	0.0134	7th	Loc. 6	0.0801	0.0136	7th	Loc. 2-Off	0.0803
W.E., LTP, *n*-Cat II	0.0076	8th	Loc. 5	0.0781	0.0077	8th	Loc. 7	0.0784
W.E., LTP, *n*-Cat III	0.0043	9th	Loc. 2-Off	0.0736	0.0043	9th	Loc. 1A	0.0692
W.E., LTP, *n*-Cat IV	0.0024	10th	Loc. 7	0.0651	0.0024	10th	Loc. 3	0.0656
W.E., LTP, *n*-Cat V	0.0013	11th	Loc. 1A	0.0651	0.0013	11th	Loc. 2	0.0652
W.E., LTP, *n*-Cat VI	0.0007	12th	Loc. 1	0.0598	0.0008	12th	Loc. 1	0.0600
W.E., 5-Off, *n*-Cat I	0.0390				0.0395			
W.E., 5-Off, *n*-Cat II	0.0221				0.0224			
W.E., 5-Off, *n*-Cat III	0.0124				0.0126			
W.E., 5-Off, *n*-Cat IV	0.0069				0.0070			
W.E., 5-Off, *n*-Cat V	0.0037				0.0037			
W.E., 5-Off, *n*-Cat VI	0.0022				0.0022			
W.E., 6-Off, *n*-Cat I	0.0390				0.0395			
W.E., 6-Off, *n*-Cat II	0.0221				0.0224			
W.E., 6-Off, *n*-Cat III	0.0124				0.0126			
W.E., 6-Off, *n*-Cat IV	0.0069				0.0070			
W.E., 6-Off, *n*-Cat V	0.0037				0.0037			
W.E., 6-Off, *n*-Cat VI	0.0022				0.0022			
W.E., 4-Off, *n*-Cat I	0.1136				0.1151			
W.E., 4-Off, *n*-Cat II	0.0644				0.0652			
W.E., 4-Off, *n*-Cat III	0.0361				0.0366			
W.E., 4-Off, *n*-Cat IV	0.0200				0.0202			
W.E., 4-Off, *n*-Cat V	0.0108				0.0109			
W.E., 4-Off, *n*-Cat VI	0.0063				0.0064			

Upon examination of the sensitivity analysis presented above, it can be seen that Location 1-Off is strongly weighted, taking the top-ranking position in many of the scenarios presented. It can also be seen that, excluding the scenario that involves equalized PV weights, Locations 1, 2, and 3 are consistently ranked amongst the least preferred alternatives.

3.7. Analysis via ANP

It is usually a helpful first step in any MCDM process to depict the decision problem pictorially (as was done previously for the MAUT and the AHP analyses). Using the process outlined in Table 17 as a guide, the general arrangement for the particular decision problem at hand was modeled using SuperDecisions, and a screenshot is illustrated below in

Figure ***22***.

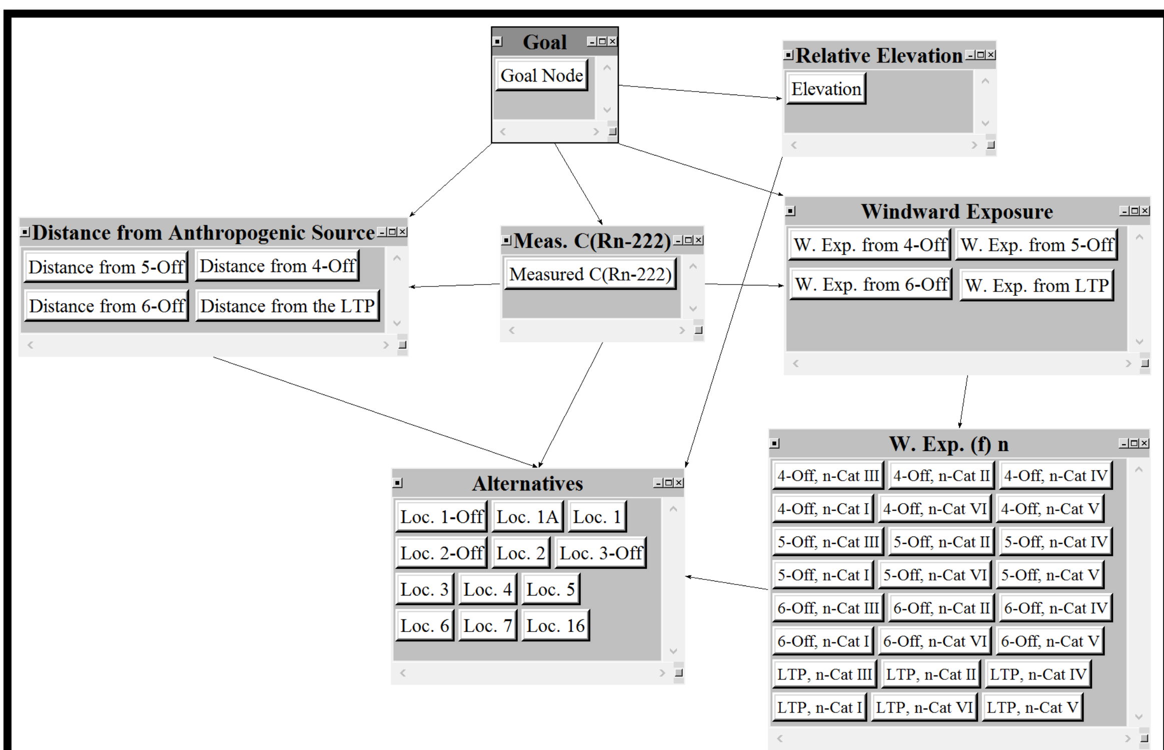


Figure 22. ANP Decision Model for Dissertation Problem Statement.

Upon closer examination of

Figure ***22*** above, the benefit of ANP relative to AHP should be immediately apparent: the ability of ANP to account for feedbacks. As pertains to this particular decision problem, this ability is especially necessary for the networked relationships between distance and measured ^{222}Rn concentration and windward exposure. The AHP model presented earlier could not evaluate the criteria in this manner, because in AHP, all criteria are assumed to be independent. However, as discussed throughout this dissertation, the ultimate source of radon is geology (which is assumed to be consistent for the specimen site), and is furthermore affected by a multitude of factors. In addressing the problem statement, both distance and wind speed have an unmistakable ability to affect measured radon levels emanating from a source (with radon dispersion and increased dissipation occurring as a function of both increasing distance and wind speed). These are feedbacks that affect the alternatives and goal of the decision problem.

Once the cluster and node connections have been established, pairwise comparisons need to be assessed between the nodes and clusters of each network. As with AHP, a pairwise comparison is required for each relationship in the model. (There were 34 pairwise comparisons required to adequately analyze the decision problem via AHP). For the ANP analysis in the DSS, nodes that form a comparison group must be in the same cluster; the influence of children nodes on a parent node are assessed (and if the network is so designed, comparisons can be done on the influence that a parent node has on children nodes).

There is no difference between the pairwise comparisons used in ANP from those used in AHP. The process of making the comparisons, utilizing the Saaty Scale, determining PVs, CRs, *etc.* are all the same. As such, all 34 pairwise comparisons that were used in the AHP analysis are also used in the ANP model. In the previous section [for the AHP analysis], the pairwise comparisons were computed using Microsoft Excel as the DSS; each of these pairwise comparisons were subsequently programmed into SuperDecisions. Since these pairwise comparisons are the same, it was not deemed necessary to repeat them for the ANP analysis.

However, since the ANP analysis accounts for feedback relationships, three additional pairwise comparisons—beyond the 34 that were needed for the AHP analysis—are needed. Referring to

Figure ***22***, these additional comparisons are presented in the tables below, and are introduced as follows:

- Tables Table ***157***, Table ***158***, and Table ***159*** represent the pairwise comparison that is needed to assess the relationship between the clusters of Alternatives *v.* Windward Exposure *v.* Distance all with respect to the $\boldsymbol{C}_{\text{Rn-222}}$, the same pairwise comparison with derived local priorities, and the matrix calculation of the pairwise comparison's CR, respectively;
- Tables Table ***160***, Table ***161***, and Table ***162*** represent the node pairwise comparison that is needed to assess the relationship between Distance from the LTP *v.* Distance from 5-Off *v.* Distance from 6-Off *v.* Distance from 4-Off all with respect to the $\boldsymbol{C}_{\text{Rn-222}}$, the same pairwise comparison with derived local priorities, and the matrix calculation of the pairwise comparison's CR, respectively; and
- Tables Table ***163***, Table ***164***, and Table ***165*** represent the node pairwise comparison that is needed to assess the relationship between Windward Exposure from the LTP *v.* Windward Exposure from 5-Off *v.* Windward Exposure from 6-Off *v.* Windward Exposure from 4-Off all with respect to the $\boldsymbol{C}_{\text{Rn-222}}$, the same pairwise comparison with

derived local priorities, and the matrix calculation of the pairwise comparison's CR, respectively.

Table 157. Analysis via ANP: Cluster Comparison with respect to $\boldsymbol{C}_{\text{Rn-222}}$ for Alternatives, Windward Exposure, and Distance.

	Alternatives	Distance	W. Exp.
Alternatives	1.0000	1.0000	1.0000
Distance	1.0000	1.0000	1.0000
W. Exp.	1.0000	1.0000	1.0000
Sum	3.0000	3.0000	3.0000

Table 158. Analysis via ANP: Normalized Cluster Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Alternatives, Windward Exposure, and Distance, with Priority Vectors.

	Alternatives	Distance	W. Exp.	PV
Alternatives	0.3333	0.3333	0.3333	0.3333
Distance	0.3333	0.3333	0.3333	0.3333
W. Exp.	0.3333	0.3333	0.3333	0.3333

Table 159. Analysis via ANP: Consistency Check for Cluster Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Alternatives, Windward Exposure, and Distance.

	Alternatives	**Distance**	**W. Exp.**	**WS**	**WS / PV**
PV	0.3333	0.3333	0.3333	1.0000	
Alternatives	0.3333	0.3333	0.3333	1.0000	3.0000
Distance	0.3333	0.3333	0.3333	1.0000	3.0000
W. Exp.	0.3333	0.3333	0.3333	1.0000	3.0000
Size of *n*	3.0000				
Sum	9.0000				
Sum/*n* = λ_{max}	3.0000				
CI	0.0000				
RI	0.4887				
CR	0.0000				

Table 160. Analysis via ANP: Node Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Distance from 4-Off, 5-Off, 6-Off, and the LTP.

	From 4-Off	**From 5-Off**	**From 6-Off**	**From LTP**
From 4-Off	1.0000	0.5000	0.5000	0.3333
From 5-Off	2.0000	1.0000	1.0000	0.5000
From 6-Off	2.0000	1.0000	1.0000	0.5000
From LTP	3.0000	2.0000	2.0000	1.0000
Sum	8.0000	4.5000	4.5000	2.3333

Table 161. Analysis via ANP: Normalized Node Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Distance from 4-Off, 5-Off, 6-Off, and the LTP, with Priority Vectors.

	From 4-Off	**From 5-Off**	**From 6-Off**	**From LTP**	**PV**
From 4-Off	0.1250	0.0625	0.0625	0.0417	0.0729
From 5-Off	0.2500	0.1250	0.1250	0.0625	0.1406
From 6-Off	0.2500	0.1250	0.1250	0.0625	0.1406
From LTP	0.3750	0.2500	0.2500	0.1250	0.2500

Table 162. Analysis via ANP: Consistency Check for Node Comparison with respect to Measured $C_{Rn\text{-}222}$ for Distance from 4-Off, 5-Off, 6-Off, and the LTP.

	From 4-Off	From 5-Off	From 6-Off	From LTP	Weighted Sum	WS / PV
PV	0.0729	0.1406	0.1406	0.2500	0.6042	
From 4-Off	0.0729	0.0703	0.0703	0.0833	0.2969	4.0714
From 5-Off	0.1458	0.1406	0.1406	0.1250	0.5521	3.9259
From 6-Off	0.1458	0.1406	0.1406	0.1250	0.5521	3.9259
From LTP	0.2188	0.2812	0.2812	0.2500	1.0312	4.1250
Size of *n*	4.0000					
Sum	16.0483					
Sum/*n* = λ_{max}	4.0121					
CI	0.0040					
RI	0.8045					
CR	0.0050					

Table 163. Analysis via ANP: Node Comparison with respect to Measured $C_{Rn\text{-}222}$ for Windward Exposure from 4-Off, 5-Off, 6-Off, and the LTP.

	From 4-Off	From 5-Off	From 6-Off	From LTP
From 4-Off	1.0000	3.0000	3.0000	8.0000
From 5-Off	0.3333	1.0000	1.0000	3.0000
From 6-Off	0.3333	1.0000	1.0000	3.0000
From LTP	0.1250	0.3333	0.3333	1.0000
Sum	1.7917	5.3333	5.3333	15.0000

Table 164. Analysis via ANP: Normalized Node Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Windward Exposure from 4-Off, 5-Off, 6-Off, and the LTP, with Priority Vectors.

	From 4-Off	From 5-Off	From 6-Off	From LTP	PV
From 4-Off	0.1250	0.3750	0.3750	1.0000	0.4687
From 5-Off	0.0417	0.1250	0.1250	0.3750	0.1667
From 6-Off	0.0417	0.1250	0.1250	0.3750	0.1667
From LTP	0.0156	0.0417	0.0417	0.1250	0.0560

Table 165. Analysis via ANP: Consistency Check for Node Comparison with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$ for Windward Exposure from 4-Off, 5-Off, 6-Off, and the LTP.

	From 4-Off	From 5-Off	From 6-Off	From LTP	Weighted Sum	WS / PV
PV	0.4687	0.1667	0.1667	0.0560	0.8581	
From 4-Off	0.0729	0.4219	0.4219	2.0000	2.9167	6.2222
From 5-Off	0.0243	0.1406	0.1406	0.7500	1.0556	6.3334
From 6-Off	0.0243	0.1406	0.1406	0.7500	1.0556	6.3334
From LTP	0.0091	0.0469	0.0469	0.2500	0.3529	6.3023
Size of *n*	4.0000					
Sum	25.1913					
Sum/*n* = λ_{max}	6.2978					
CI	0.7659					
RI	0.8045					
CR	0.9521					

As mentioned in Table 17, in order to determine the aggregated (global) PVs for each alternative, ANP agglomerates the priorities and PVs of all submatrices into a supermatrix. Since the DSS does all of this automatically, and since the DSS is assumed to be accurate enough for the needs of this dissertation, it was not deemed necessary to print out or duplicate the information for presentation; but suffice it to say, if a user so desires, several variations can be examined using SuperDecisions, including: the unweighted and weighted supermatrices, the limit supermatrix, and several means to calculate the global priorities and sensitivity analyses.[98] The global rankings, along with the total (*i.e., raw* non-normalized), normalized, and ideal results of the alternatives cluster of the ANP analysis[99] are presented in Figure 23 below, which is a screenshot image from the DSS. A comprehensive summary of all the rankings and similar results for all the nodes and clusters is provided in Table 166.

Alternative Rankings

Graphic	Alternatives	Total	Normal	Ideal	Ranking
	Loc. 1	0.0233	0.0581	0.3201	12
	Loc. 1-Off	0.0729	0.1815	1.0000	1
	Loc. 1A	0.0268	0.0667	0.3672	10
	Loc. 2	0.0254	0.0633	0.3487	11
	Loc. 2-Off	0.0360	0.0897	0.4941	2
	Loc. 3	0.0282	0.0703	0.3871	9
	Loc. 3-Off	0.0358	0.0891	0.4910	3
	Loc. 4	0.0303	0.0755	0.4159	6
	Loc. 5	0.0288	0.0717	0.3948	8
	Loc. 6	0.0311	0.0773	0.4260	5
	Loc. 7	0.0289	0.0719	0.3960	7
	Loc. 16	0.0341	0.0849	0.4679	4

Figure 23. Specimen: Analysis via ANP: Summary of Global Priorities.

[98] It is not within the scope of this dissertation to explain the inner workings of SuperDecisions; however, Saaty (2016) offers a full tutorial on the SuperDecisions software and should be consulted as necessary for further information.

[99] Appendix A to this dissertation contains a PDF of the Full Report created from the SuperDecisions software.

Table 166. Specimen: Analysis via ANP: Summary of Global Priorities Normalized by Cluster.

Cluster Name	Name	Normalized By Cluster	Limiting
Distance	Distance from 4-Off	0.1238	0.0174
	Distance from 5-Off	0.2324	0.0326
	Distance from 6-Off	0.2759	0.0387
	Distance from the LTP	0.3680	0.0516
$C_{Rn\text{-}222}$	Measured C(Rn-222)	1.0000	0.0153
Elev.	Elevation	1.0000	0.0702
Wind Exposure	W. Exp. from 4-Off	0.5543	0.1032
	W. Exp. from 5-Off	0.1902	0.0354
	W. Exp. from 6-Off	0.1902	0.0354
	W. Exp. from LTP	0.0653	0.0122
Windward Exposure as a Function of Wind Speed	W.E., 4-Off, *n*-Cat I	0.2579	0.0480
	W.E., 4-Off, *n*-Cat II	0.1439	0.0268
	W.E., 4-Off, *n*-Cat III	0.0766	0.0143
	W.E., 4-Off, *n*-Cat IV	0.0442	0.0082
	W.E., 4-Off, *n*-Cat V	0.0178	0.0033
	W.E., 4-Off, *n*-Cat VI	0.0139	0.0026
	W.E., 5-Off, *n*-Cat I	0.0891	0.0166
	W.E., 5-Off, *n*-Cat II	0.0496	0.0092
	W.E., 5-Off, *n*-Cat III	0.0264	0.0049
	W.E., 5-Off, *n*-Cat IV	0.0139	0.0026
	W.E., 5-Off, *n*-Cat V	0.0062	0.0011
	W.E., 5-Off, *n*-Cat VI	0.0050	0.0009
	W.E., 6-Off, *n*-Cat I	0.0891	0.0166
	W.E., 6-Off, *n*-Cat II	0.0496	0.0092
	W.E., 6-Off, *n*-Cat III	0.0264	0.0049
	W.E., 6-Off, *n*-Cat IV	0.0139	0.0026
	W.E., 6-Off, *n*-Cat V	0.0062	0.0011
	W.E., 6-Off, *n*-Cat VI	0.0050	0.0009
	W.E., LTP, *n*-Cat I	0.0306	0.0057
	W.E., LTP, *n*-Cat II	0.0170	0.0032
	W.E., LTP, *n*-Cat III	0.0091	0.0017
	W.E., LTP, *n*-Cat IV	0.0048	0.0009
	W.E., LTP, *n*-Cat V	0.0021	0.0004
	W.E., LTP, *n*-Cat VI	0.0017	0.0003

Table 165 (Cont'd). Specimen: Analysis via ANP:
Summary of Global Priorities Normalized by Cluster.

Cluster Name	Name	Normalized By Cluster	Limiting
Alternatives	Loc. 1	0.0581	0.0233
	Loc. 1-Off	0.1815	0.0729
	Loc. 1A	0.0667	0.0268
	Loc. 2	0.0633	0.0254
	Loc. 2-Off	0.0897	0.0360
	Loc. 3	0.0703	0.0282
	Loc. 3-Off	0.0891	0.0358
	Loc. 4	0.0755	0.0303
	Loc. 5	0.0717	0.0288
	Loc. 6	0.0773	0.0311
	Loc. 7	0.0719	0.0289
	Loc. 16	0.0849	0.0341

Just like the analyses done via MAUT and AHP, a sensitivity analysis is also a prudent step here. Unlike those done for MAUT and AHP, the DSS for ANP allows for very sophisticated sensitivity analyses to be done with extraordinary ease—literally at the push of a button. Beyond that, since the underlying premise for evaluating any decision via ANP is to model and understand the network (*i.e.,* the dependencies), the need to understand the sensitivity of the various parameters in the decision model is all the more apparent. Noting of course, that the point of performing any sensitivity analysis is to determine the stability of judgments and priorities by changing various input parameters (one at a time). This being the case, the next several figures (which span several pages) are presented. The figures illustrating the sensitivity analyses conducted for the decision problem are presented as screenshots from the DSS and are introduced as follows:

- Figure 24 depicts what effect changing the ranking of Location 1 to zero would have on the overall global priority rankings of the other alternatives;

- Figure 25 depicts what effect changing the ranking of Location 1-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 26 depicts what effect changing the ranking of Location 1A to zero would have on the overall global priority rankings of the other alternatives;
- Figure 27 depicts what effect changing the ranking of Location 2 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 28 depicts what effect changing the ranking of Location 2-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 29 depicts what effect changing the ranking of Location 3 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 30 depicts what effect changing the ranking of Location 3-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 31 depicts what effect changing the ranking of Location 4 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 32 depicts what effect changing the ranking of Location 5 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 33 depicts what effect changing the ranking of Location 6 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 34 depicts what effect changing the ranking of Location 7 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 35 depicts what effect changing the ranking of Location 16 to zero would have on the overall global priority rankings of the other alternatives;

- Figure 36 depicts what effect changing the value of the C_{Rn-222} Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 37 depicts what effect changing the value of the Elevation Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 38 depicts what effect changing the value of the Distance from 4-Off Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 39 depicts what effect changing the value of the Distance from 5-Off Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 40 depicts what effect changing the value of the Distance from 6-Off Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 41 depicts what effect changing the value of the Distance from the LTP Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 42 depicts what effect changing the value of the Windward Exposure from 4-Off Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 43 depicts what effect changing the value of the Windward Exposure from 5-Off Node to zero would have on the overall global priority rankings of the other alternatives;
- Figure 44 depicts what effect changing the value of the Windward Exposure from 6-Off Node to zero would have on the overall global priority rankings of the other alternatives; and

- Figure 45 depicts what effect changing the value of the Windward Exposure from the LTP Node to zero would have on the overall global priority rankings of the other alternatives.

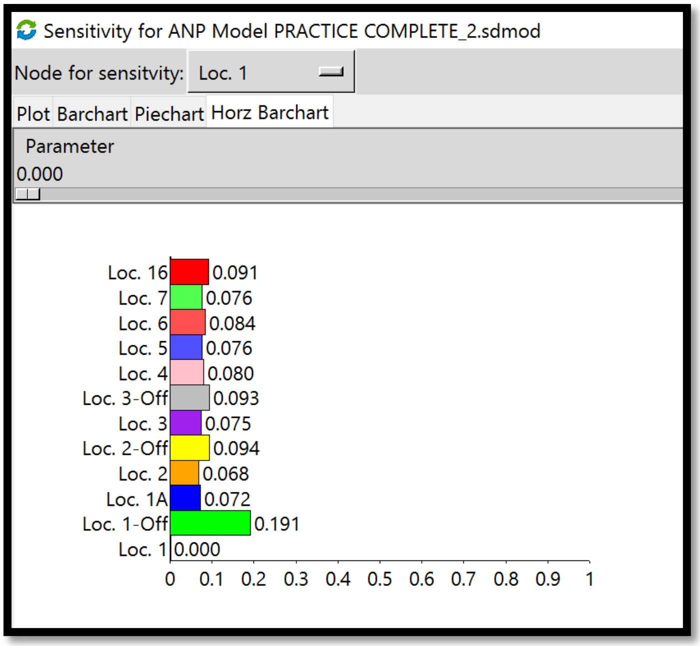


Figure 24. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1 Manipulated to Zero.

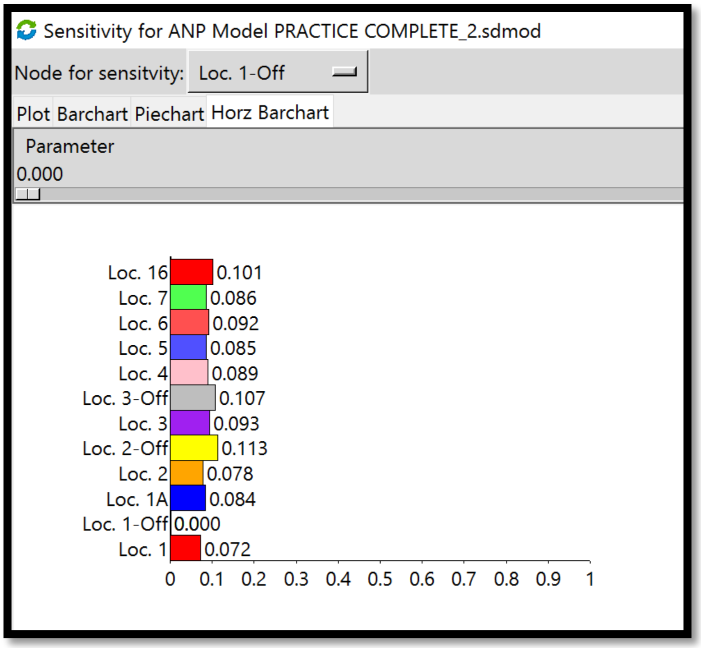


Figure 25. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1-Off Manipulated to Zero.

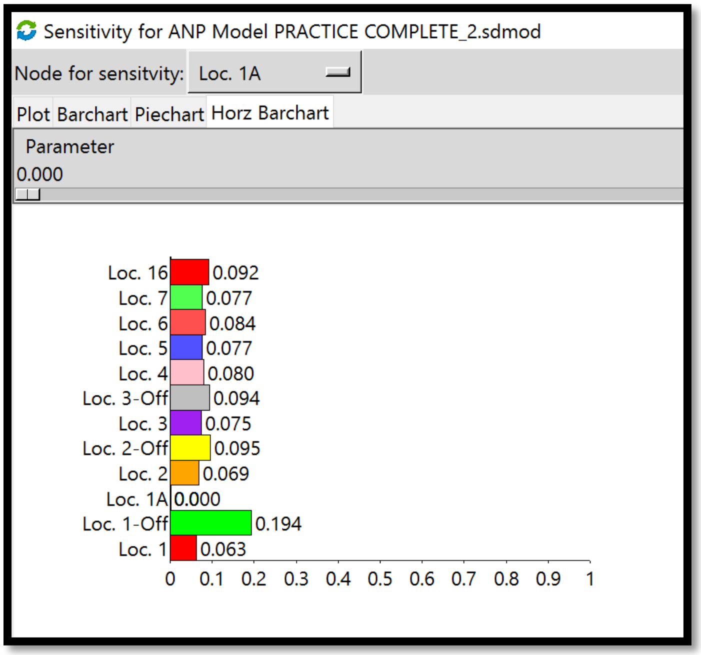


Figure 26. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1A Manipulated to Zero.

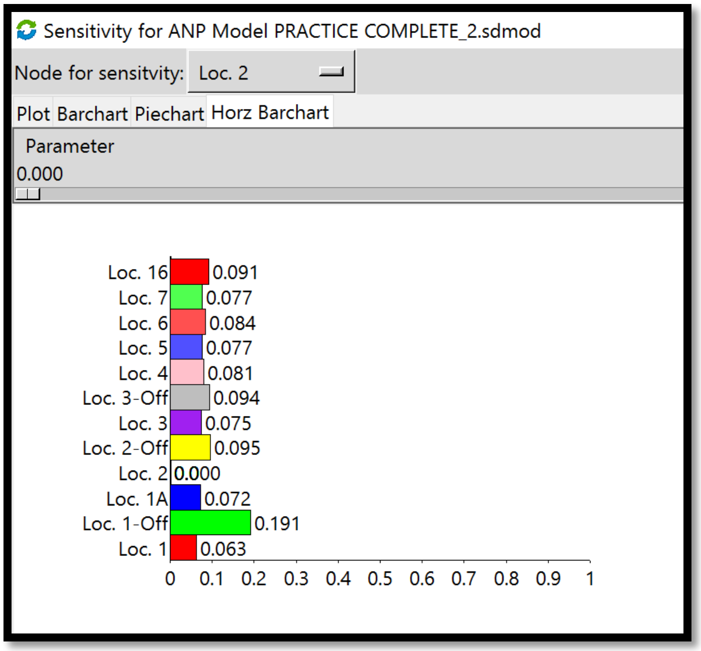


Figure 27. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1-Off Manipulated to Zero.

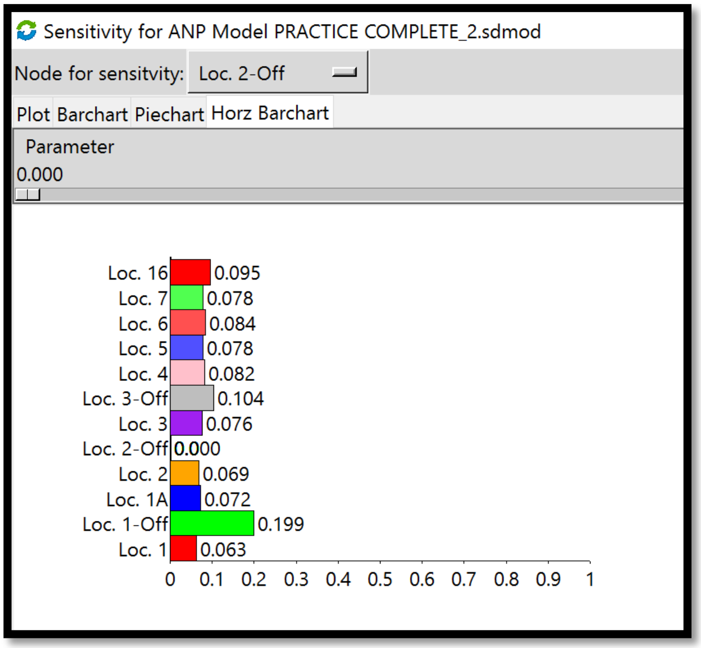


Figure 28. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 2-Off Manipulated to Zero.

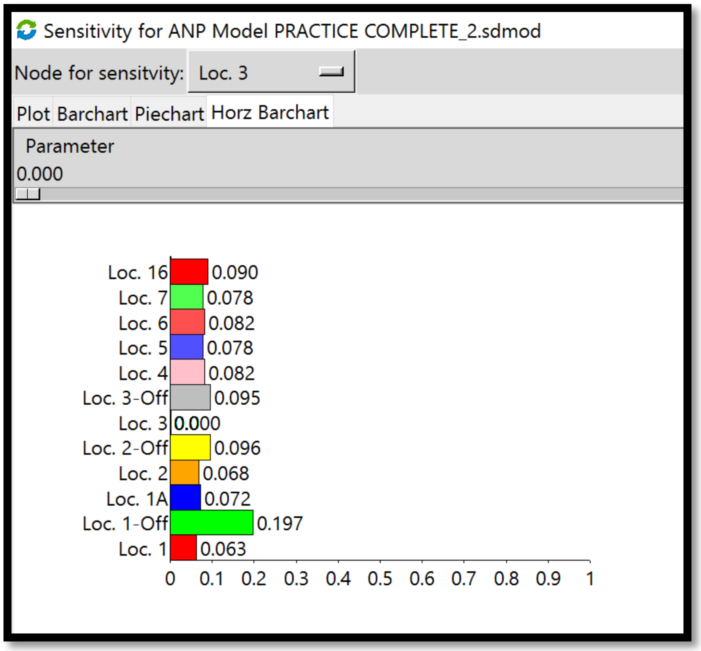


Figure 29. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 3 Manipulated to Zero.

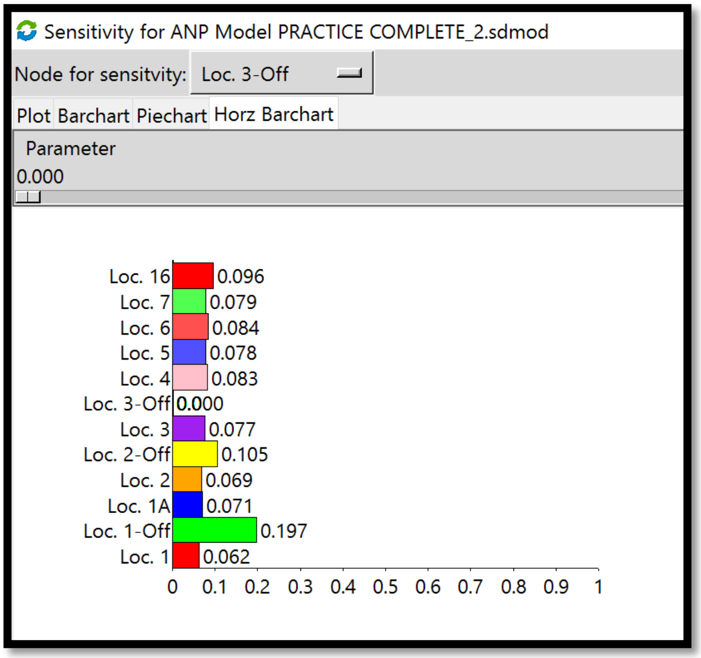


Figure 30. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 3-Off Manipulated to Zero.

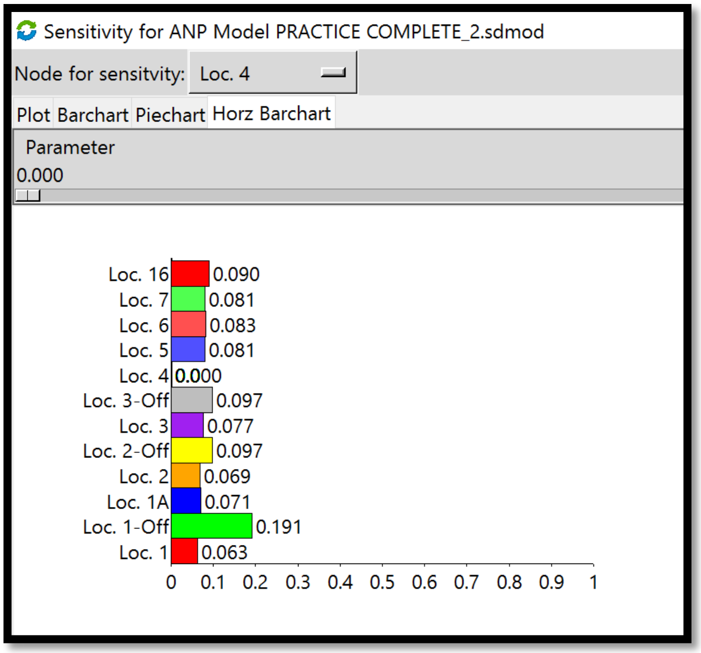


Figure 31. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 4 Manipulated to Zero.

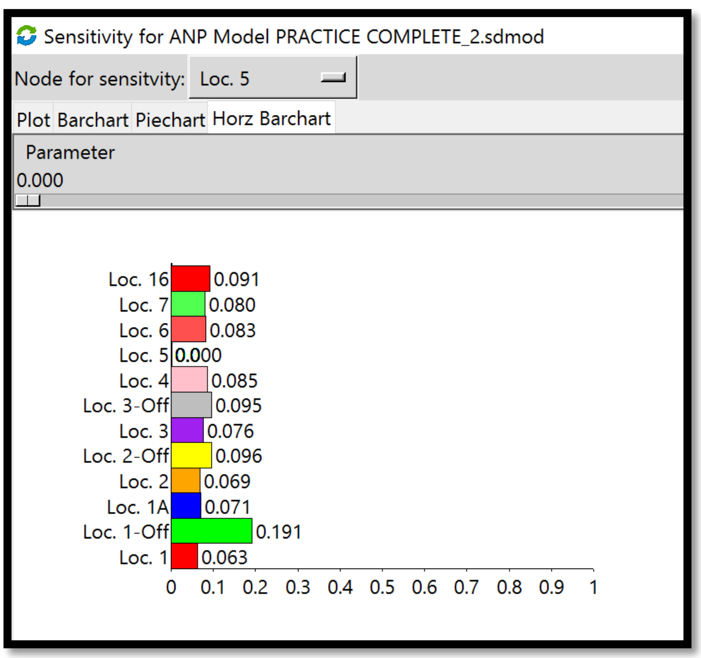


Figure 32. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 5 Manipulated to Zero.

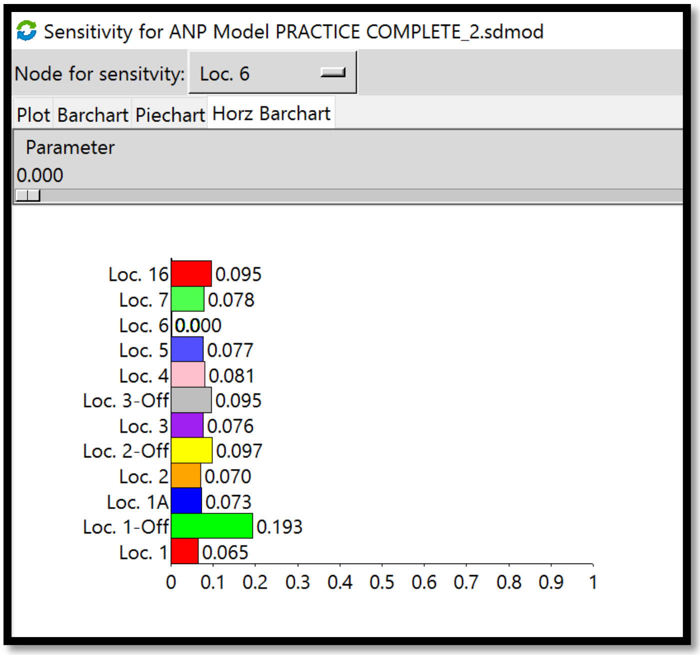


Figure 33. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 6 Manipulated to Zero.

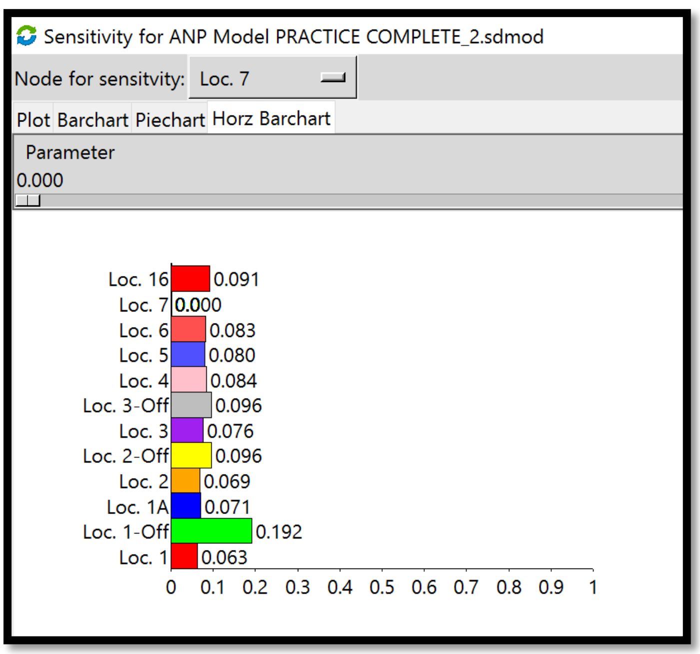


Figure 34. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 7 Manipulated to Zero.

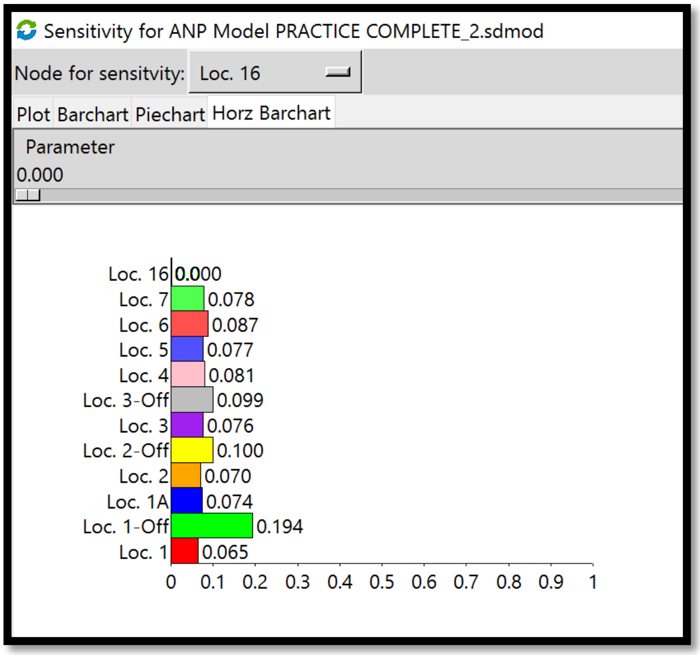


Figure 35. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 16 Manipulated to Zero.

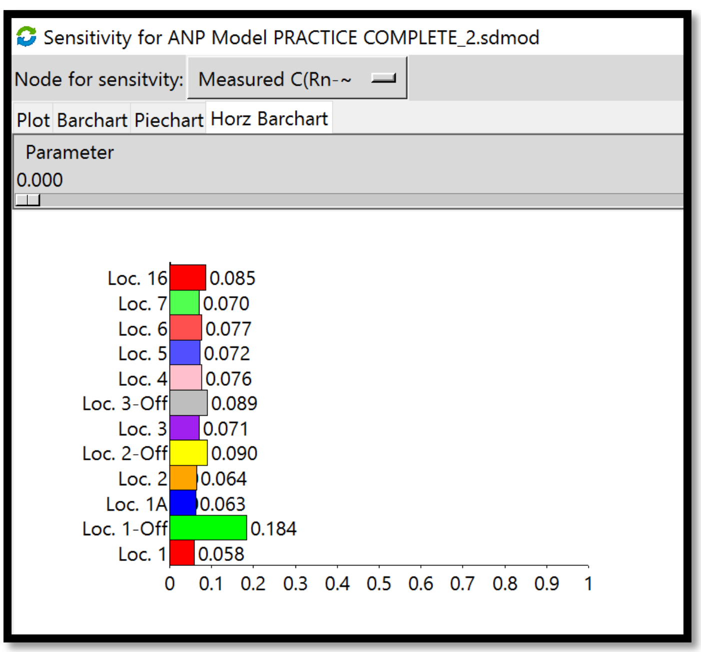


Figure 36. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After $C_{\text{Rn-222}}$ Node Manipulated to Zero.

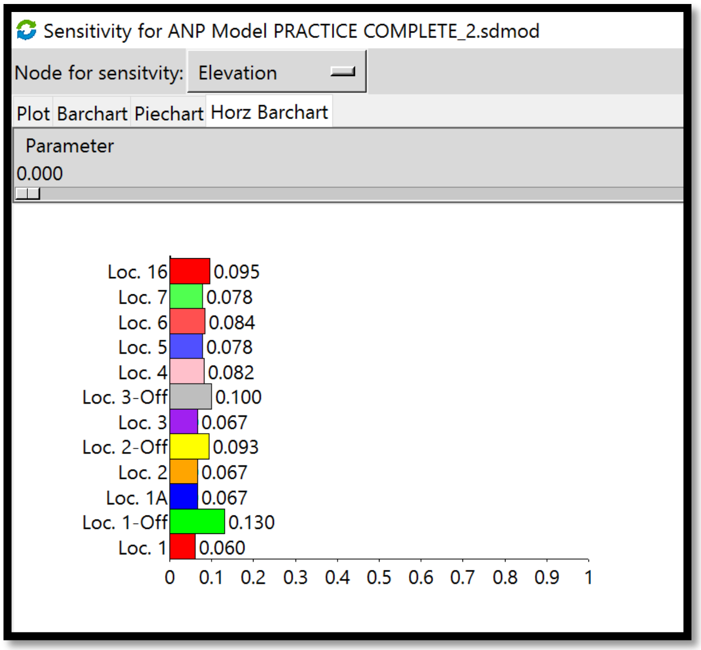


Figure 37. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Elevation Node Manipulated to Zero.

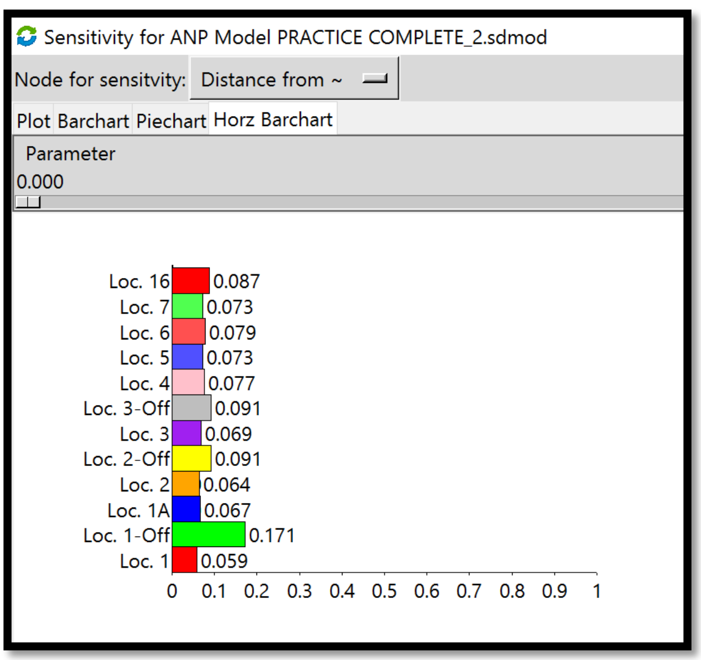


Figure 38. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Distance from 4-Off Node Manipulated to Zero.

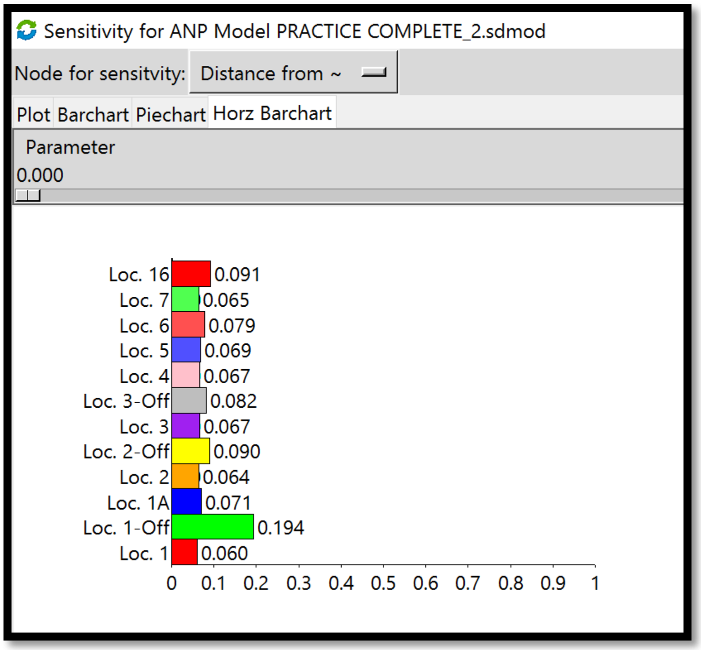


Figure 39. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Distance from 5-Off Node Manipulated to Zero.

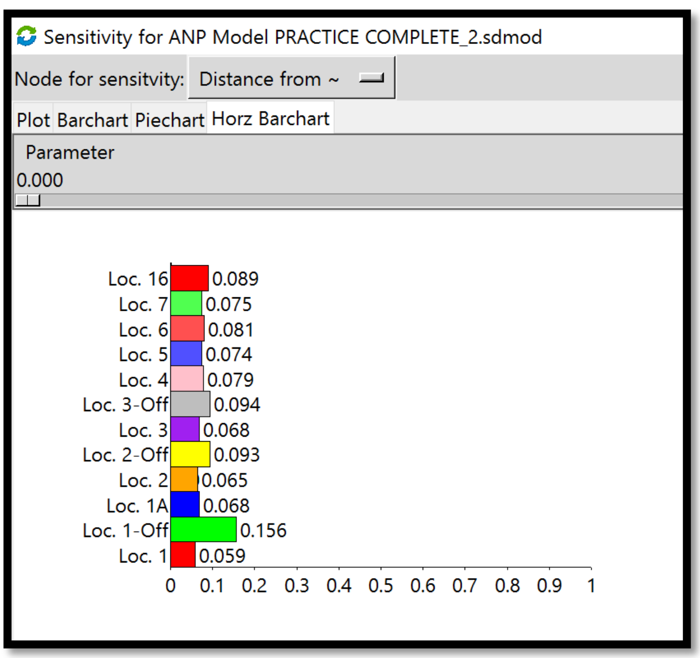


Figure 40. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Distance from 6-Off Node Manipulated to Zero.

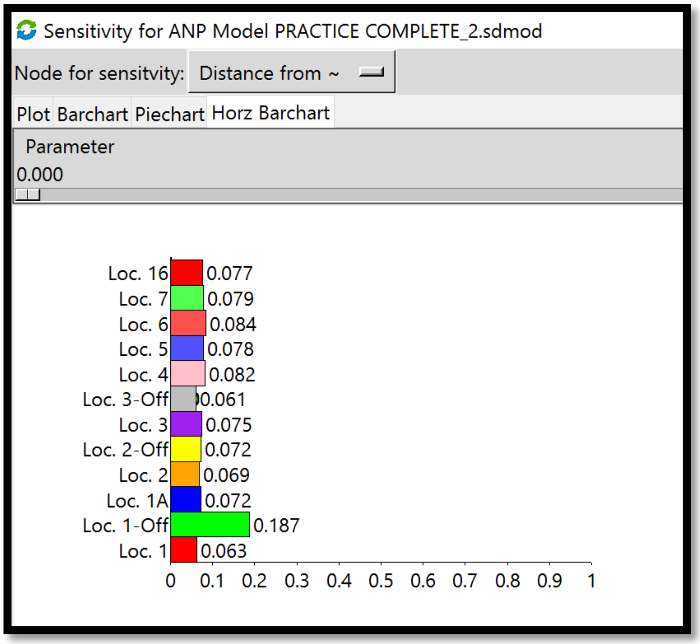


Figure 41. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Distance from the LTP Node Manipulated to Zero.

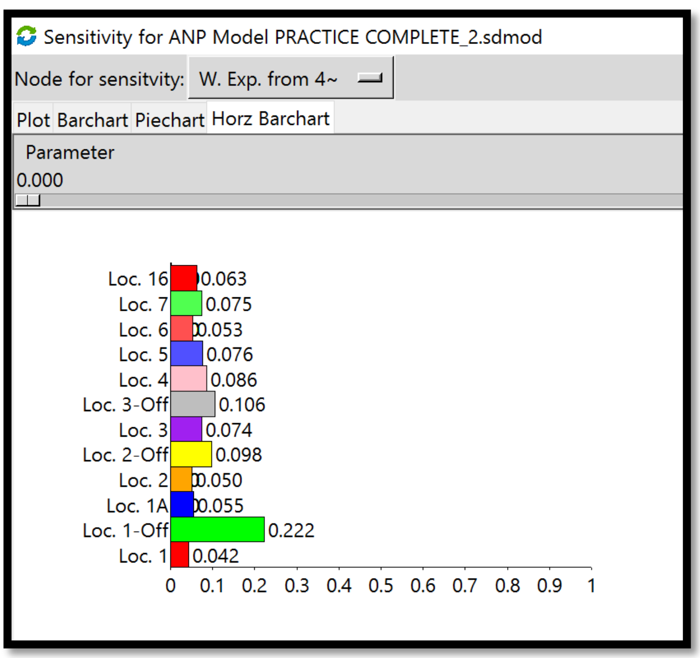


Figure 42. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Wind Exposure from 4-Off Node Manipulated to Zero.

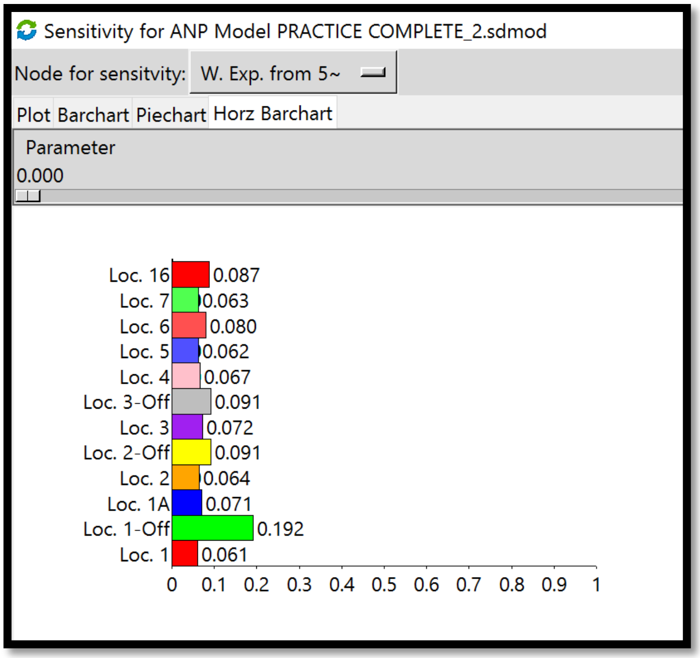


Figure 43. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Wind Exposure from 5-Off Node Manipulated to Zero.

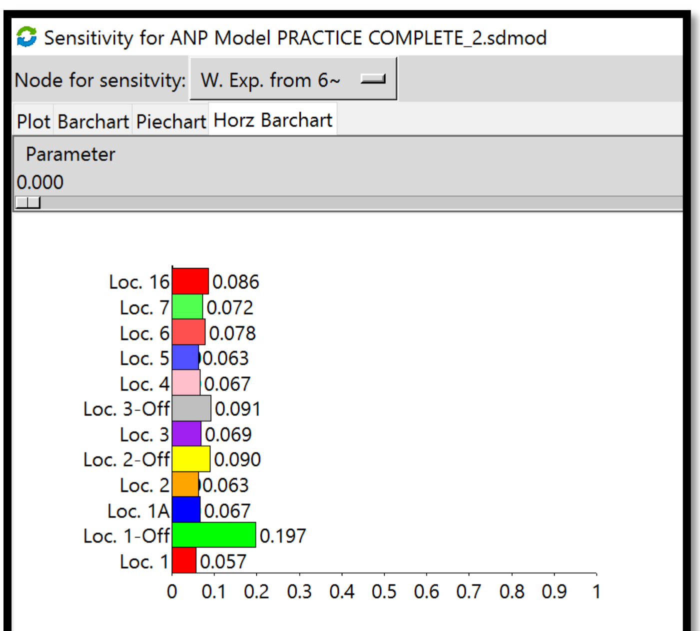


Figure 44. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Wind Exposure from 6-Off Node Manipulated to Zero.

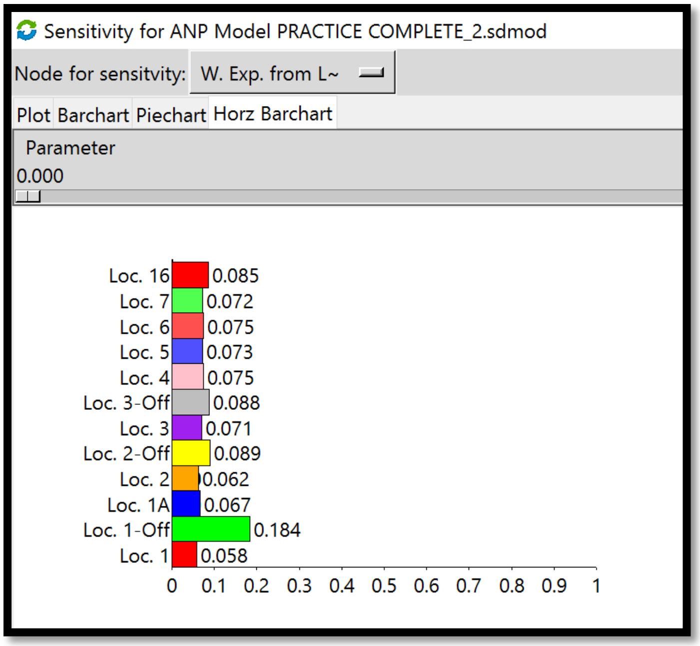


Figure 45. Specimen: Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Wind Exposure from the LTP Node Manipulated to Zero.

The ANP analysis, while relying on the vast majority of the same relationships established during the AHP analysis, evaluated the decision problem in the context of the relationships between the elements of the model in ways that neither MAUT nor AHP could; the results of the ANP analysis are further supported by the robust sensitivity analysis, which, as can be seen via direct examination, fully justifies and supports the selection of Location 1-Off as the highest-ranking alternative.

3.8. MAUT—ANP Hybrid: Testing the Validation Approach

In accordance with the research method and approach laid out in Section 3.3, this dissertation will now turn its focus to testing the first of the three hybrid models: The Validation Approach. As previously mentioned, the same decision problem has been analyzed three different ways, via MAUT, AHP, and ANP. Each of these analyses was done independently of one other,[100] and throughout the development for each of the three MCDM models, the same source data was used, and the same general logic was applied in determining preferences, utilities, priorities, and weighting factors.

The first step in the Validation Approach is to depict the decision problem pictorially. This is presented in Figure 46 below.

[100] By *independent*, what is meant, is that the *results* of one model do not affect the *inputs* of another. The fact that two different DSSs were used (Microsoft Excel for AHP and SuperDecisions for ANP), should underscore the notion of separate and independent analyses, even though the same pairwise relationships that were used for AHP were subsequently programmed into SuperDecisions for the ANP analysis.

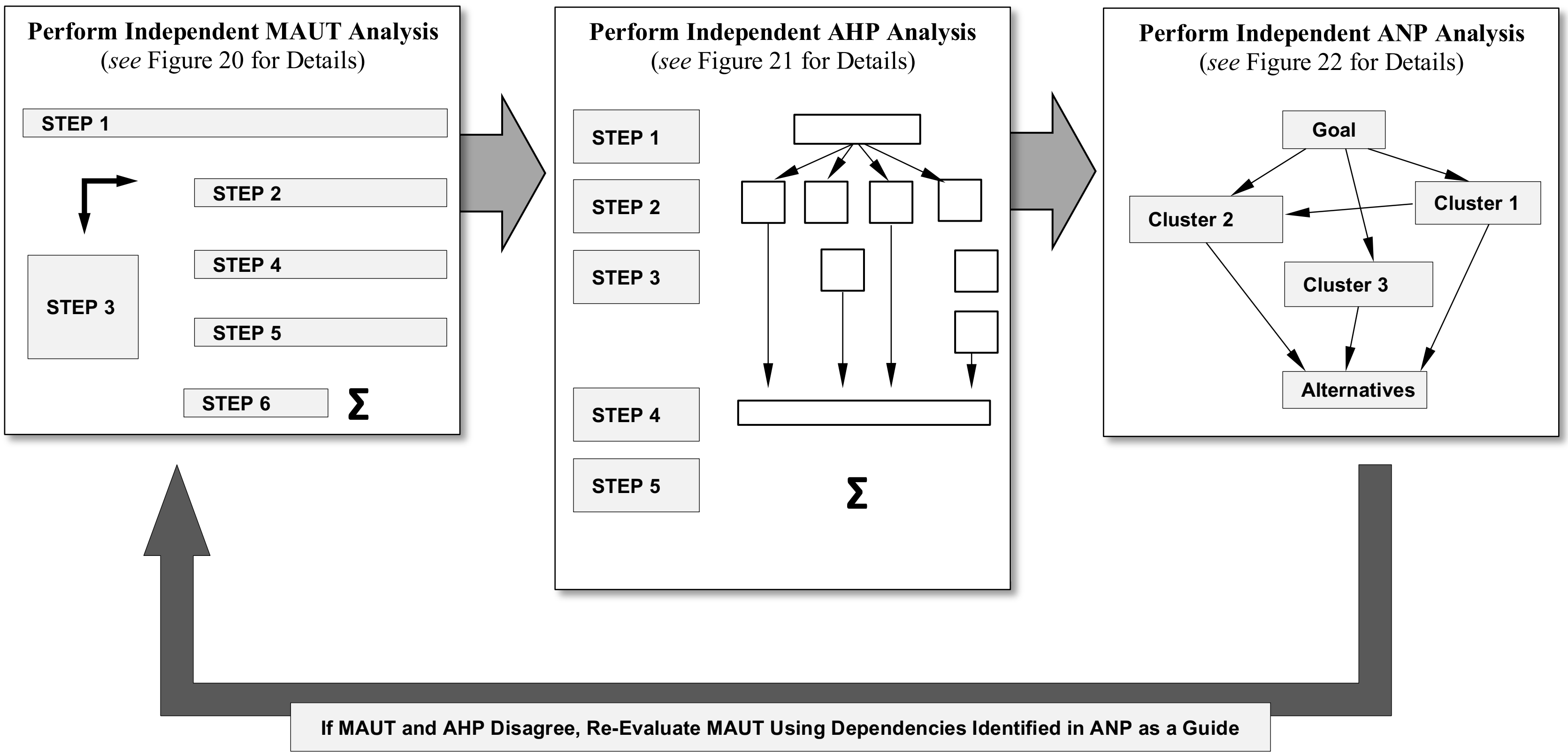


Figure 46. Validation Approach Decision Model for Dissertation Problem Statement.

The next step is to determine if the MCDM models agree. As can be plainly seen by examining Tables Table ***50***, Table ***155***, and Table ***166***, the models are not in agreement. The MAUT analysis indicated Location 6 to be the most rational choice, while the AHP and ANP analyses both indicated Location 1-Off to be the highest-ranking choice. This being the case, the procedure prescribed in Section 3.3 has been executed, the details of which are discussed next.

First, the priorities, CRs, and PVs associated with the AHP model were all checked for mathematical accuracy. No discrepancies were noted. Next, the utility values and weighting factors associated with the MAUT model were checked for mathematical accuracy. No discrepancies were noted there either. Since no discrepancies were noted, it was not deemed necessary to re-run the models at this point.

Next, the ANP modeled results were examined and compared to those of the AHP model. Even without reviewing the global priorities, it is evident from looking at

Figure ***22*** that there are feedback relationships in the model; namely, those associated with the measured $\boldsymbol{C}_{\text{Rn-222}}$ with respect to distance from an anthropogenic source and windward exposure from an anthropogenic source. Noting this, the MAUT model was re-examined.

Upon re-examination, the method used to determine the utility values was not found to be flawed. The spreadsheet calculations to accord the same were also checked and found to be accurate and perfectly aligned with the logic that underpins them. The normalization constraint for the weighting values was checked and was not found to have been violated. However, upon closer scrutiny, it was determined that the weighting factors no longer adequately reflected the importance of their respective attributes based on the revelations made apparent by the ANP model.

Upon examination, when the normalized priorities of Table 166 are compared to the MAUT weighting factors of Table 48, it can be reasonably construed that the weighting factors in the MAUT are too heavy-handed, especially for the wind speed categories. To verify this, and to make a fair comparison, it is necessary to normalize the weighting factors of Table 48 in groupings that align with those of Table 166. The original weighting factors, along with the re-normalized-per-group weighting factors of the MAUT are compared to the normalized-by-cluster priorities of the ANP model and are presented in Table 167 below.

Table 167. Validation Approach: MAUT Weighting Factors *v.* ANP Global Priorities.

Group / Cluster Name	Criteria	Original MAUT Normalized Weighting Factors (*see* Table 42)	Original MAUT Weighting Factors Normalized per Group	Normalized ANP Global Cluster Priorities (*see* Table 158)	First Order Difference
Meas. C_{Rn-222}	**Meas. C_{Rn-222}**	0.0098	1.0000	1.0000	**0.0000**
Distance	**Distance from LTP**	0.0980	0.6667	0.3680	**0.2987**
	Distance from 5-Off	0.0196	0.1333	0.2324	**-0.0991**
	Distance from 6-Off	0.0196	0.1333	0.2759	**-0.1426**
	Distance from 4-Off	0.0098	0.0667	0.1238	**-0.0571**
Elevation	**Elevation**	0.0980	1.0000	1.0000	**0.0000**
Windward Exposure	**W. Exp. from LTP**	N/A	0.0000	0.5543	**-0.5543**
	W. Exp. from 5-Off	N/A	0.0000	0.1902	**-0.1902**
	W. Exp. from 6-Off	N/A	0.0000	0.1902	**-0.1902**
	W. Exp. from 4-Off	N/A	0.0000	0.0653	**-0.0653**
Wind Speed Categories	**LTP, *n*-Cat I**	0.0784	0.1039	0.0306	**0.0733**
	LTP, *n*-Cat II	0.0392	0.0519	0.0170	**0.0349**
	LTP, *n*-Cat III	0.0294	0.0390	0.0091	**0.0299**
	LTP, *n*-Cat IV	0.0196	0.0260	0.0048	**0.0212**
	LTP, *n*-Cat V	0.0098	0.0130	0.0021	**0.0109**
	LTP, *n*-Cat VI	0.0098	0.0130	0.0017	**0.0113**
	5-Off, *n*-Cat I	0.0784	0.1039	0.0891	**0.0148**
	5-Off, *n*-Cat II	0.0392	0.0519	0.0496	**0.0023**
	5-Off, *n*-Cat III	0.0294	0.0390	0.0264	**0.0126**
	5-Off, *n*-Cat IV	0.0196	0.0260	0.0139	**0.0121**
	5-Off, *n*-Cat V	0.0098	0.0130	0.0062	**0.0068**
	5-Off, *n*-Cat VI	0.0098	0.0130	0.0050	**0.0080**

Table 166 (Cont'd). Validation Approach: MAUT Weighting Factors *v.* ANP Global Priorities.

Group / Cluster Name	Criteria	Original MAUT Normalized Weighting Factors (*see* Table 42)	Original MAUT Weighting Factors Normalized per Group	Normalized ANP Global Cluster Priorities (*see* Table 158)	First Order Difference
Wind Speed Categories	**6-Off, *n*-Cat I**	0.0784	0.1039	0.0891	**0.0148**
	6-Off, *n*-Cat II	0.0392	0.0519	0.0496	**0.0023**
	6-Off, *n*-Cat III	0.0294	0.0390	0.0264	**0.0126**
	6-Off, *n*-Cat IV	0.0196	0.0260	0.0139	**0.0121**
	6-Off, *n*-Cat V	0.0098	0.0130	0.0062	**0.0068**
	6-Off, *n*-Cat VI	0.0098	0.0130	0.0050	**0.0080**
	4-Off, *n*-Cat I	0.0882	0.1169	0.2579	**-0.1410**
	4-Off, *n*-Cat II	0.0392	0.0519	0.1439	**-0.0920**
	4-Off, *n*-Cat III	0.0294	0.0390	0.0766	**-0.0376**
	4-Off, *n*-Cat IV	0.0196	0.0260	0.0442	**-0.0182**
	4-Off, *n*-Cat V	0.0098	0.0130	0.0178	**-0.0048**
	4-Off, *n*-Cat VI	0.0098	0.0130	0.0139	**-0.0009**

Of note in Table 167, is the fact that there were no values originally ascribed to the "Windward Exposure" criterion in the initial MAUT (referring to the "N/A" entries in Table 159). The reason for this, is because in the MAUT exercise, windward exposure was intended to be accounted for as part of the "Wind Speed" criterion. To be clear, this criterion was evaluated as "Windward Exposure from an Anthropogenic Source as a function of Wind Speed." By virtue of the pairwise comparisons done in the AHP and ANP exercises, this criterion was broken up into its constituent pieces.

To reinforce the premise of the Validation Approach, a reminder is offered to aver the notion of independence; that is to say, the intent is to view each MCDM model separately and *not* to directly use the results of one model as inputs to another. If, upon examination, alterations to the original data are required (as is the case here), the Validation Approach is meant to compel decision-makers to revisit initial judgments and to determine if new judgments are necessary; if so, the approach determines if such new judgments more accurately reflect the circumstances at hand based on the new perspectives gleaned by running the decision problem through a different MCDM model.

Table 168 below presents the initial MAUT weighting factors (both the direct inputs and the normalized values) along with re-evaluated weighting factors using the first order differences calculated in Table 167 as a guide. To help gauge the level of improvement made (*i.e.,* the improvement with respect to alignment between the two models), Table 169 presents the first order differences between the re-evaluated MAUT weighting factors (normalized per group to effect a fairer comparison) and the ANP Global Priorities. Table 170 presents the first order differences of the first order differences between Tables Table ***167*** and Table ***169***.

Table 168. Validation Approach: Re-Evaluated MAUT Weighting Factors.

Criteria	Original MAUT Weighting Factor (Directly Assigned)	Original MAUT Weighting Factor (Normalized)	New MAUT Weighting Factor (Directly Assigned)	New MAUT Weighting Factor (Normalized)	First Order Difference, Original *v.* New Normalized Values
Meas. $C_{Rn\text{-}222}$	1	0.0098	1	0.0135	-0.0037
Distance from LTP	10	0.098	10	0.1351	-0.0371
Distance from 5-Off	2	0.0196	2	0.027	-0.0074
Distance from 6-Off	2	0.0196	2	0.027	-0.0074
Distance from 4-Off	1	0.0098	1	0.0135	-0.0037
Elevation	10	0.098	10	0.1351	-0.0371
LTP, *n*-Cat I	7	0.0686	6	0.0811	-0.0125
LTP, *n*-Cat II	4	0.0392	1	0.0135	0.0257
LTP, *n*-Cat III	3	0.0294	1	0.0135	0.0159
LTP, *n*-Cat IV	2	0.0196	1	0.0135	0.0061
LTP, *n*-Cat V	1	0.0098	1	0.0135	-0.0037
LTP, *n*-Cat VI	1	0.0098	1	0.0135	-0.0037
5-Off, *n*-Cat I	8	0.0784	7	0.0946	-0.0162
5-Off, *n*-Cat II	4	0.0392	1	0.0135	0.0257
5-Off, *n*-Cat III	3	0.0294	1	0.0135	0.0159
5-Off, *n*-Cat IV	2	0.0196	1	0.0135	0.0061
5-Off, *n*-Cat V	1	0.0098	1	0.0135	-0.0037
5-Off, *n*-Cat VI	1	0.0098	1	0.0135	-0.0037
6-Off, *n*-Cat I	8	0.0784	7	0.0946	-0.0162
6-Off, *n*-Cat II	4	0.0392	1	0.0135	0.0257
6-Off, *n*-Cat III	3	0.0294	1	0.0135	0.0159
6-Off, *n*-Cat IV	2	0.0196	1	0.0135	0.0061
6-Off, *n*-Cat V	1	0.0098	1	0.0135	-0.0037
6-Off, *n*-Cat VI	1	0.0098	1	0.0135	-0.0037

Table 167 (Cont'd). Validation Approach: Re-Evaluated MAUT Weighting Factors.

Criteria	Original MAUT Weighting Factor (Directly Assigned)	Original MAUT Weighting Factor (Normalized)	New MAUT Weighting Factor (Directly Assigned)	New MAUT Weighting Factor (Normalized)	First Order Difference, Original *v.* New Normalized Values
4-Off, *n*-Cat I	9	0.0882	8	0.1081	-0.0199
4-Off, *n*-Cat II	4	0.0392	1	0.0135	0.0257
4-Off, *n*-Cat III	3	0.0294	1	0.0135	0.0159
4-Off, *n*-Cat IV	2	0.0196	1	0.0135	0.0061
4-Off, *n*-Cat V	1	0.0098	1	0.0135	-0.0037
4-Off, *n*-Cat VI	1	0.0098	1	0.0135	-0.0037

Table 169. Validation Approach: Re-Evaluated MAUT Weighting Factors *v.* ANP Global Priorities.

Group / Cluster Name	Criteria	Re-Evaluated MAUT Normalized Weighting Factor (*see* Table 160)	Re-Evaluated MAUT Weighting Factor Normalized per Group	Normalized ANP Global Cluster Priority (*see* Table 158)	First Order Difference
Meas. $C_{Rn\text{-}222}$	**Meas. $C_{Rn\text{-}222}$**	0.0135	1.0000	1.0000	0.0000
Distance	**Distance from LTP**	0.1351	0.6668	0.3680	0.2988
	Distance from 5-Off	0.027	0.1333	0.2324	-0.0991
	Distance from 6-Off	0.027	0.1333	0.2759	-0.1426
	Distance from 4-Off	0.0135	0.0666	0.1238	-0.0572
Elevation	**Elevation**	0.1351	1.0000	1.0000	0.0000
Windward Exposure	**W. Exp. from LTP**	0.0000	0.0000	0.5543	-0.5543
	W. Exp. from 5-Off	0.0000	0.0000	0.1902	-0.1902
	W. Exp. from 6-Off	0.0000	0.0000	0.1902	-0.1902
	W. Exp. from 4-Off	0.0000	0.0000	0.0653	-0.0653
Wind Speed Categories	**LTP, *n*-Cat I**	0.0811	0.1251	0.0306	0.0945
	LTP, *n*-Cat II	0.0135	0.0208	0.0170	0.0038
	LTP, *n*-Cat III	0.0135	0.0208	0.0091	0.0117
	LTP, *n*-Cat IV	0.0135	0.0208	0.0048	0.0160
	LTP, *n*-Cat V	0.0135	0.0208	0.0021	0.0187
	LTP, *n*-Cat VI	0.0135	0.0208	0.0017	0.0191
	5-Off, *n*-Cat I	0.0946	0.1459	0.0891	0.0568
	5-Off, *n*-Cat II	0.0135	0.0208	0.0496	-0.0288
	5-Off, *n*-Cat III	0.0135	0.0208	0.0264	-0.0056
	5-Off, *n*-Cat IV	0.0135	0.0208	0.0139	0.0069
	5-Off, *n*-Cat V	0.0135	0.0208	0.0062	0.0146
	5-Off, *n*-Cat VI	0.0135	0.0208	0.0050	0.0158

Table 168 (Cont'd). Validation Approach: MAUT Weighting Factors *v.* ANP Global Priorities.

Group / Cluster Name	**Criteria**	**Re-Evaluated MAUT Normalized Weighting Factor (*see* Table 160)**	**Re-Evaluated MAUT Weighting Factor Normalized per Group**	**Normalized ANP Global Cluster Priority (*see* Table 158)**	**First Order Difference**
Wind Speed Categories	**6-Off, *n*-Cat I**	0.0946	0.1459	0.0891	0.0568
	6-Off, *n*-Cat II	0.0135	0.0208	0.0496	-0.0288
	6-Off, *n*-Cat III	0.0135	0.0208	0.0264	-0.0056
	6-Off, *n*-Cat IV	0.0135	0.0208	0.0139	0.0069
	6-Off, *n*-Cat V	0.0135	0.0208	0.0062	0.0146
	6-Off, *n*-Cat VI	0.0135	0.0208	0.0050	0.0158
	4-Off, *n*-Cat I	0.1081	0.1667	0.2579	-0.0912
	4-Off, *n*-Cat II	0.0135	0.0208	0.1439	-0.1231
	4-Off, *n*-Cat III	0.0135	0.0208	0.0766	-0.0558
	4-Off, *n*-Cat IV	0.0135	0.0208	0.0442	-0.0234
	4-Off, *n*-Cat V	0.0135	0.0208	0.0178	0.0030
	4-Off, *n*-Cat VI	0.0135	0.0208	0.0139	0.0069

Table 170. Validation Approach: First Order Differences of First Order Differences between ANP Global Priorities and Original *v.* Re-Evaluated MAUT Weighting Factors.

Criteria	First Order Difference, Original MAUT Weighting Factors (Normalized by Group) *v.* ANP Global Cluster Priorities	First Order Difference, Re-Evaluated MAUT Weighting Factors (Normalized by Group) *v.* ANP Global Cluster Priorities	First Order Difference
Meas. C_{Rn-222}	0.0000	0.0000	**0.0000**
Distance from LTP	0.2987	0.2988	**-0.0001**
Distance from 5-Off	-0.0991	-0.0991	**0.0000**
Distance from 6-Off	-0.1426	-0.1426	**0.0000**
Distance from 4-Off	-0.0571	-0.0572	**0.0001**
Elevation	0.0000	0.0000	**0.0000**
W. Exp. from LTP	-0.5543	-0.5543	**0.0000**
W. Exp. from 5-Off	-0.1902	-0.1902	**0.0000**
W. Exp. from 6-Off	-0.1902	-0.1902	**0.0000**
W. Exp. from 4-Off	-0.0653	-0.0653	**0.0000**
LTP, *n*-Cat I	0.0733	0.0945	**-0.0212**
LTP, *n*-Cat II	0.0349	0.0038	**0.0311**
LTP, *n*-Cat III	0.0299	0.0117	**0.0182**
LTP, *n*-Cat IV	0.0212	0.0160	**0.0052**
LTP, *n*-Cat V	0.0109	0.0187	**-0.0078**
LTP, *n*-Cat VI	0.0113	0.0191	**-0.0078**
5-Off, *n*-Cat I	0.0148	0.0568	**-0.0420**
5-Off, *n*-Cat II	0.0023	-0.0288	**0.0311**
5-Off, *n*-Cat III	0.0126	-0.0056	**0.0182**
5-Off, *n*-Cat IV	0.0121	0.0069	**0.0052**
5-Off, *n*-Cat V	0.0068	0.0146	**-0.0078**
5-Off, *n*-Cat VI	0.0080	0.0158	**-0.0078**
6-Off, *n*-Cat I	0.0148	0.0568	**-0.0420**
6-Off, *n*-Cat II	0.0023	-0.0288	**0.0311**
6-Off, *n*-Cat III	0.0126	-0.0056	**0.0182**
6-Off, *n*-Cat IV	0.0121	0.0069	**0.0052**
6-Off, *n*-Cat V	0.0068	0.0146	**-0.0078**
6-Off, *n*-Cat VI	0.0080	0.0158	**-0.0078**
4-Off, *n*-Cat I	-0.1410	-0.0912	**-0.0498**
4-Off, *n*-Cat II	-0.0920	-0.1231	**0.0311**
4-Off, *n*-Cat III	-0.0376	-0.0558	**0.0182**
4-Off, *n*-Cat IV	-0.0182	-0.0234	**0.0052**
4-Off, *n*-Cat V	-0.0048	0.0030	**-0.0078**
4-Off, *n*-Cat VI	-0.0009	0.0069	**-0.0078**

By interpreting the data presented above in Tables Table ***168***, Table ***169***, and Table ***170***, a few qualifying statements can be made. First, thanks to the results provided by the ANP analysis, it can be seen that greater emphasis has been placed on the lower wind speed categories than on the higher ones for each windward source (*i.e.,* the priorities for "*n*-Cat I" were universally higher with respect to windward exposure from each anthropogenic source). Secondly, it can also be seen that the priorities of all "*n*-Cats" from the LTP are substantially lower than the priorities of every other wind speed category with respect to windward exposure from every other anthropogenic source. Conversely, a substantially higher emphasis (*i.e.,* much greater priority) was placed on every wind speed category associated with the windward exposure from 4-Off, noting that "4-Off, *n*-Cat I" has the highest priority of all wind speed categories with respect to *any* anthropogenic source. The priorities associated with the wind speed categories for 5-Off and 6-Off lie in the middle between those of 4-Off and the LTP.

In viewing this data, everything makes sense. Relative to the other anthropogenic sources, the LTP is a juggernaut in terms of radon emissions; conversely, location 4-Off is far away and a relatively small source. Bearing in mind the problem statement of this dissertation, the undue bias posed on an alternative by an anthropogenic source becomes a function of the size of that source, the distance from that source, and the [wind speed] intensity of windward exposure from that source. As directed by the protocols established in Section 3.3, the MAUT analysis can now be re-run using the new weighting factors. No changes were made to the inputs of the MAUT; the results of the revised MAUT analysis are shown below in Table 171.[101] A summary comparison of all the WMU values is presented in Table 172.

[101] As was done initially in Tables 43 and 44, the simple additive technique has been employed, and the utility values associated with each decision attribute for each alternative have been multiplied by their respective normalized weighting factors and then summed to provide an aggregated utility value for each alternative.

Table 171. Validation Approach: Re-Evaluated Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 1		Loc. 2		Loc. 3	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0135	1.3707	**0.0185**	1.1667	**0.0158**	1.5341	**0.0207**
Distance from LTP	0.1351	1.0057	**0.1359**	1.9028	**0.2571**	1.9190	**0.2593**
Distance from 5-Off	0.0270	4.6027	**0.1243**	6.1099	**0.1650**	8.0278	**0.2168**
Distance from 6-Off	0.0270	5.4160	**0.1462**	5.1406	**0.1388**	6.7575	**0.1825**
Distance form 4-Off	0.0135	6.6796	**0.0902**	4.9670	**0.0671**	4.6132	**0.0623**
Elevation	0.1351	1.8514	**0.2501**	1.6976	**0.2293**	3.4286	**0.4632**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	0.0811	8.1428	**0.6604**	9.3046	**0.7546**	8.0083	**0.6495**
$2.1 < n < 3.6$ m/s	0.0135	2.3346	**0.0315**	9.1066	**0.1229**	5.2794	**0.0713**
$3.6 < n < 5.7$ m/s	0.0135	1.0000	**0.0135**	6.9111	**0.0933**	2.5209	**0.0340**
$5.7 < n < 8.8$ m/s	0.0135	1.0000	**0.0135**	4.1053	**0.0554**	1.3298	**0.0180**
$8.8 < n < 11.1$ m/s	0.0135	2.2761	**0.0307**	1.0000	**0.0135**	1.5373	**0.0208**
$n > 11.1$ m/s	0.0135	3.4286	**0.0463**	1.0000	**0.0135**	5.3571	**0.0723**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0946	3.9072	**0.3696**	7.2474	**0.6856**	7.2474	**0.6856**
$2.1 < n < 3.6$ m/s	0.0135	1.0000	**0.0135**	4.9162	**0.0664**	4.9162	**0.0664**
$3.6 < n < 5.7$ m/s	0.0135	1.0000	**0.0135**	6.0969	**0.0823**	6.0969	**0.0823**
$5.7 < n < 8.8$ m/s	0.0135	4.0782	**0.0551**	5.2508	**0.0709**	5.2508	**0.0709**
$8.8 < n < 11.1$ m/s	0.0135	6.6038	**0.0892**	4.5660	**0.0616**	4.5660	**0.0616**
$n > 11.1$ m/s	0.0135	10.0000	**0.1350**	7.5250	**0.1016**	7.5250	**0.1016**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0946	5.3185	**0.5031**	7.4961	**0.7091**	8.1853	**0.7743**
$2.1 < n < 3.6$ m/s	0.0135	7.9022	**0.1067**	6.2317	**0.0841**	6.8532	**0.0925**
$3.6 < n < 5.7$ m/s	0.0135	8.8893	**0.1200**	6.6471	**0.0897**	5.4637	**0.0738**
$5.7 < n < 8.8$ m/s	0.0135	9.0000	**0.1215**	8.2222	**0.1110**	7.7778	**0.1050**
$8.8 < n < 11.1$ m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
$n > 11.1$ m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.1081	7.3711	**0.7968**	7.3711	**0.7968**	3.6211	**0.3914**
$2.1 < n < 3.6$ m/s	0.0135	9.6629	**0.1304**	9.6629	**0.1304**	7.8258	**0.1056**
$3.6 < n < 5.7$ m/s	0.0135	9.7775	**0.1320**	9.7775	**0.1320**	9.7330	**0.1314**
$5.7 < n < 8.8$ m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
$8.8 < n < 11.1$ m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
$n > 11.1$ m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Aggregated Utility Score		-	**4.8225**	-	**5.7229**	-	**5.4879**

Table 170 (Cont'd). Validation Approach: Re-Evaluated Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 4		Loc. 5		Loc. 6	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0135	1.1078	**0.0150**	1.2373	**0.0167**	1.6256	**0.0219**
Distance from LTP	0.1351	2.4161	**0.3264**	1.0000	**0.1351**	1.7342	**0.2343**
Distance from 5-Off	0.0270	9.6630	**0.2609**	8.1455	**0.2199**	6.3883	**0.1725**
Distance from 6-Off	0.0270	10.0000	**0.2700**	8.9350	**0.2412**	8.5381	**0.2305**
Distance form 4-Off	0.0135	6.4887	**0.0876**	7.8420	**0.1059**	8.8056	**0.1189**
Elevation	0.1351	1.2515	**0.1691**	1.3076	**0.1767**	1.3534	**0.1828**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0811	7.6162	**0.6177**	1.0000	**0.0811**	8.2859	**0.6720**
2.1 < *n* < 3.6 m/s	0.0135	5.0037	**0.0675**	1.0000	**0.0135**	9.4706	**0.1279**
3.6 < *n* < 5.7 m/s	0.0135	4.2300	**0.0571**	3.1402	**0.0424**	10.0000	**0.1350**
5.7 < *n* < 8.8 m/s	0.0135	8.9969	**0.1215**	8.7496	**0.1181**	10.0000	**0.1350**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0946	10.0000	**0.9460**	10.0000	**0.9460**	5.2526	**0.4969**
2.1 < *n* < 3.6 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	4.7725	**0.0644**
3.6 < *n* < 5.7 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	6.2921	**0.0849**
5.7 < *n* < 8.8 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	9.0619	**0.1223**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0946	10.0000	**0.9460**	10.0000	**0.9460**	5.3185	**0.5031**
2.1 < *n* < 3.6 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	7.9022	**0.1067**
3.6 < *n* < 5.7 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	8.8893	**0.1200**
5.7 < *n* < 8.8 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	9.0000	**0.1215**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.1081	1.0000	**0.1081**	3.6211	**0.3914**	10.0000	**1.0810**
2.1 < *n* < 3.6 m/s	0.0135	6.5955	**0.0890**	7.8258	**0.1056**	10.0000	**0.1350**
3.6 < *n* < 5.7 m/s	0.0135	9.6440	**0.1302**	9.7330	**0.1314**	10.0000	**0.1350**
5.7 < *n* < 8.8 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Aggregated Utility Score		-	**6.2371**	-	**5.6961**	-	**6.2167**

Table 170 (Cont'd). Validation Approach: Re-Evaluated Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 7		Loc. 1A		Loc. 1-Off	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0135	2.3802	**0.0321**	10.0000	**0.1350**	1.2373	**0.0167**
Distance from LTP	0.1351	1.5254	**0.2061**	2.5952	**0.3506**	7.0609	**0.9539**
Distance from 5-Off	0.0270	9.0229	**0.2436**	3.3056	**0.0893**	4.5272	**0.1222**
Distance from 6-Off	0.0270	8.3780	**0.2262**	4.4731	**0.1208**	1.0000	**0.0270**
Distance form 4-Off	0.0135	5.7730	**0.0779**	6.8946	**0.0931**	5.0335	**0.0680**
Elevation	0.1351	1.4400	**0.1945**	2.4000	**0.3242**	10.0000	**1.3510**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0811	8.3917	**0.6806**	8.8382	**0.7168**	9.3733	**0.7602**
2.1 < *n* < 3.6 m/s	0.0135	5.3676	**0.0725**	3.2279	**0.0436**	8.2132	**0.1109**
3.6 < *n* < 5.7 m/s	0.0135	4.0418	**0.0546**	2.5836	**0.0349**	7.3345	**0.0990**
5.7 < *n* < 8.8 m/s	0.0135	7.2244	**0.0975**	3.5557	**0.0480**	6.3313	**0.0855**
8.8 < *n* < 11.1 m/s	0.0135	8.6567	**0.1169**	5.9030	**0.0797**	5.2985	**0.0715**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	7.2143	**0.0974**	5.2857	**0.0714**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0946	10.0000	**0.9460**	3.9072	**0.3696**	8.1211	**0.7683**
2.1 < *n* < 3.6 m/s	0.0135	10.0000	**0.1350**	1.0000	**0.0135**	8.2575	**0.1115**
3.6 < *n* < 5.7 m/s	0.0135	10.0000	**0.1350**	1.0000	**0.0135**	6.0969	**0.0823**
5.7 < *n* < 8.8 m/s	0.0135	10.0000	**0.1350**	4.0782	**0.0551**	1.0000	**0.0135**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	6.6038	**0.0892**	1.0000	**0.0135**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	1.0000	**0.0135**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0946	7.4961	**0.7091**	5.3185	**0.5031**	1.0000	**0.0946**
2.1 < *n* < 3.6 m/s	0.0135	6.2317	**0.0841**	7.9022	**0.1067**	1.0000	**0.0135**
3.6 < *n* < 5.7 m/s	0.0135	6.6471	**0.0897**	8.8893	**0.1200**	1.0000	**0.0135**
5.7 < *n* < 8.8 m/s	0.0135	8.2222	**0.1110**	9.0000	**0.1215**	4.9444	**0.0667**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	10.0000	**0.1350**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.1081	3.6211	**0.3914**	7.3711	**0.7968**	8.3376	**0.9013**
2.1 < *n* < 3.6 m/s	0.0135	7.8258	**0.1056**	9.6629	**0.1304**	5.7697	**0.0779**
3.6 < *n* < 5.7 m/s	0.0135	9.7330	**0.1314**	9.7775	**0.1320**	4.6044	**0.0622**
5.7 < *n* < 8.8 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	3.6211	**0.0489**
8.8 < *n* < 11.1 m/s	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	3.6000	**0.0486**
***n* > 11.1 m/s**	0.0135	10.0000	**0.1350**	10.0000	**0.1350**	5.5000	**0.0743**
Aggregated Utility Score		-	**6.0560**	-	**5.3947**	-	**6.4112**

Table 170 (Cont'd). Validation Approach: Re-Evaluated Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 2-Off		Loc. 3-Off		Loc. 16	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0135	1.0559	**0.0143**	1.0000	**0.0135**	1.1965	**0.0162**
Distance from LTP	0.1351	8.6165	**1.1641**	10.0000	**1.3510**	7.0687	**0.9550**
Distance from 5-Off	0.0270	6.5640	**0.1772**	10.0000	**0.2700**	1.0000	**0.0270**
Distance from 6-Off	0.0270	1.6342	**0.0441**	4.8168	**0.1301**	5.6153	**0.1516**
Distance form 4-Off	0.0135	3.7596	**0.0508**	1.0000	**0.0135**	10.0000	**0.1350**
Elevation	0.1351	2.4727	**0.3341**	1.0000	**0.1351**	1.0033	**0.1355**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	0.0811	9.3046	**0.7546**	10.0000	**0.8110**	9.2903	**0.7534**
$2.1 < n < 3.6$ m/s	0.0135	9.1066	**0.1229**	10.0000	**0.1350**	7.5404	**0.1018**
$3.6 < n < 5.7$ m/s	0.0135	6.9111	**0.0933**	8.4948	**0.1147**	5.1159	**0.0691**
$5.7 < n < 8.8$ m/s	0.0135	4.1053	**0.0554**	6.6611	**0.0899**	4.8885	**0.0660**
$8.8 < n < 11.1$ m/s	0.0135	1.0000	**0.0135**	4.5597	**0.0616**	6.7090	**0.0906**
$n > 11.1$ m/s	0.0135	1.0000	**0.0135**	4.7857	**0.0646**	9.0714	**0.1225**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0946	8.1211	**0.7683**	8.1211	**0.7683**	1.0000	**0.0946**
$2.1 < n < 3.6$ m/s	0.0135	8.2575	**0.1115**	8.2575	**0.1115**	6.3713	**0.0860**
$3.6 < n < 5.7$ m/s	0.0135	6.0969	**0.0823**	6.0969	**0.0823**	9.6327	**0.1300**
$5.7 < n < 8.8$ m/s	0.0135	1.0000	**0.0135**	1.0000	**0.0135**	10.0000	**0.1350**
$8.8 < n < 11.1$ m/s	0.0135	1.0000	**0.0135**	1.0000	**0.0135**	10.0000	**0.1350**
$n > 11.1$ m/s	0.0135	1.0000	**0.0135**	1.0000	**0.0135**	10.0000	**0.1350**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0946	8.6828	**0.8214**	8.5483	**0.8087**	5.2533	**0.4970**
$2.1 < n < 3.6$ m/s	0.0135	8.3295	**0.1124**	6.3353	**0.0855**	7.3842	**0.0997**
$3.6 < n < 5.7$ m/s	0.0135	6.8962	**0.0931**	6.4706	**0.0874**	9.6678	**0.1305**
$5.7 < n < 8.8$ m/s	0.0135	1.0000	**0.0135**	1.0000	**0.0135**	10.0000	**0.1350**
$8.8 < n < 11.1$ m/s	0.0135	1.0000	**0.0135**	2.8000	**0.0378**	10.0000	**0.1350**
$n > 11.1$ m/s	0.0135	1.0000	**0.0135**	2.3846	**0.0322**	10.0000	**0.1350**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.1081	8.3376	**0.9013**	6.6753	**0.7216**	10.0000	**1.0810**
$2.1 < n < 3.6$ m/s	0.0135	5.2303	**0.0706**	1.0000	**0.0135**	10.0000	**0.1350**
$3.6 < n < 5.7$ m/s	0.0135	6.4067	**0.0865**	1.0000	**0.0135**	10.0000	**0.1350**
$5.7 < n < 8.8$ m/s	0.0135	7.3789	**0.0996**	1.0000	**0.0135**	10.0000	**0.1350**
$8.8 < n < 11.1$ m/s	0.0135	7.4000	**0.0999**	1.0000	**0.0135**	10.0000	**0.1350**
$n > 11.1$ m/s	0.0135	5.5000	**0.0743**	1.0000	**0.0135**	10.0000	**0.1350**
Aggregated Utility Score		-	**6.2399**	-	**6.0466**	-	**6.2274**

Table 172. Validation Approach: Summary of Re-Evaluated Aggregated Weighted Marginal Utility Scores for Each Alternative.

Decision Problem Alternative	Aggregated Weighted Utility Score
Location 1	4.8225
Location 2	5.7229
Location 3	5.4879
Location 4	6.2371
Location 5	5.6961
Location 6	6.2167
Location 7	6.0560
Location 1A	5.3947
Location 1-Off	**6.4112**
Location 2-Off	6.2399
Location 3-Off	6.0466
Location 16	6.2274

As usual, a sensitivity analysis is prudent. Table 173 presents the results of the sensitivity analysis done for the re-evaluated MAUT analysis. Like the previous sensitivity analyses done in this dissertation, manipulation of each of the influencers to various values has been performed, and the corresponding effect on the outcomes (*i.e.,* the alternatives ranking) is presented.

Table 173. Sensitivity Analysis for Validated MAUT Model Run.

Criteria	As-Is: Criteria Weighting Factor	As-Is: Rank	As-Is: Alternative	As-Is: Aggregated Weighted Utility Score	What-If Scenario I: Criteria Weighting Factor	What-If Scenario I: Rank	What-If Scenario I: Alternative	What-If Scenario I: Aggregated Weighted Utility Score
	What Changed? Nothing.				What Changed? *All Criteria Weighting Factors Equalized.*			
		Alternatives Ranking				Alternatives Ranking		
$C_{Rn\text{-}222}$	0.0135	1st	Loc. 1-Off	6.4112	0.0333	1st	Loc. 4	6.8055
Distance, LTP	0.1351	2nd	Loc. 2-Off	6.2399	0.0333	2nd	Loc. 6	6.7496
Distance, 5-Off	0.0270	3rd	Loc. 4	6.2371	0.0333	3rd	Loc. 5	6.4537
Distance, 6-Off	0.0270	4th	Loc. 16	6.2274	0.0333	4th	Loc. 7	6.4018
Distance, 4-Off	0.0135	5th	Loc. 2-Off	6.2167	0.0333	5th	Loc. 16	6.2540
Elevation	0.1351	6th	Loc. 6	6.0560	0.0333	6th	Loc. 1A	5.1856
W.E., LTP, *n*-Cat I	0.0811	7th	Loc. 7	6.0466	0.0333	7th	Loc. 2	5.1164
W.E., LTP, *n*-Cat II	0.0135	8th	Loc. 2-Off	5.7229	0.0333	8th	Loc. 3	4.8499
W.E., LTP, *n*-Cat III	0.0135	9th	Loc. 2	5.6961	0.0333	9th	Loc. 1-Off	4.6028
W.E., LTP, *n*-Cat IV	0.0135	10th	Loc. 3	5.4879	0.0333	10th	Loc. 1	4.4569
W.E., LTP, *n*-Cat V	0.0135	11th	Loc. 1A	5.3947	0.0333	11th	Loc. 3-Off	4.4292
W.E., LTP, *n*-Cat VI	0.0135	12th	Loc. 1	4.8225	0.0333	12th	Loc. 2-Off	4.0454
W.E., 5-Off, *n*-Cat I	0.0946				0.0333			
W.E., 5-Off, *n*-Cat II	0.0135				0.0333			
W.E., 5-Off, *n*-Cat III	0.0135				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0135				0.0333			
W.E., 5-Off, *n*-Cat V	0.0135				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0135				0.0333			
W.E., 6-Off, *n*-Cat I	0.0946				0.0333			
W.E., 6-Off, *n*-Cat II	0.0135				0.0333			
W.E., 6-Off, *n*-Cat III	0.0135				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0135				0.0333			
W.E., 6-Off, *n*-Cat V	0.0135				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0135				0.0333			
W.E., 4-Off, *n*-Cat I	0.1081				0.0333			
W.E., 4-Off, *n*-Cat II	0.0135				0.0333			
W.E., 4-Off, *n*-Cat III	0.0135				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0135				0.0333			
W.E., 4-Off, *n*-Cat V	0.0135				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0135				0.0333			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

	What-If Scenario II — What Changed? *All Wind-Related Weighting Factors Reduced 10% from Original "As-Is" Values.*				**What-If Scenario III** — What Changed? *All Wind-Related Weighting Factors Reduced 20% from Original "As-Is" Values.*			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0144	1st	Loc. 1-Off	6.4444	0.0155	1st	Loc. 1-Off	6.4796
Distance, LTP	0.1445	2nd	Loc. 2-Off	6.1988	0.1553	2nd	Loc. 2-Off	6.1487
Distance, 5-Off	0.0289	3rd	Loc. 16	6.1478	0.0310	3rd	Loc. 16	6.0534
Distance, 6-Off	0.0289	4th	Loc. 4	6.1259	0.0310	4th	Loc. 3-Off	6.0005
Distance, 4-Off	0.0144	5th	Loc. 6	6.0884	0.0155	5th	Loc. 4	5.9953
Elevation	0.1445	6th	Loc. 3-Off	6.0264	0.1553	6th	Loc. 6	5.9380
W.E., LTP, *n*-Cat I	0.0781	7th	Loc. 7	5.9357	0.0746	7th	Loc. 7	5.7947
W.E., LTP, *n*-Cat II	0.0130	8th	Loc. 2	5.6035	0.0124	8th	Loc. 2	5.4636
W.E., LTP, *n*-Cat III	0.0130	9th	Loc. 5	5.5801	0.0124	9th	Loc. 5	5.4442
W.E., LTP, *n*-Cat IV	0.0130	10th	Loc. 3	5.4127	0.0124	10th	Loc. 3	5.3238
W.E., LTP, *n*-Cat V	0.0130	11th	Loc. 1A	5.3131	0.0124	11th	Loc. 1A	5.2170
W.E., LTP, *n*-Cat VI	0.0130	12th	Loc. 1	4.7250	0.0124	12th	Loc. 1	4.6108
W.E., 5-Off, *n*-Cat I	0.0911				0.0870			
W.E., 5-Off, *n*-Cat II	0.0130				0.0124			
W.E., 5-Off, *n*-Cat III	0.0130				0.0124			
W.E., 5-Off, *n*-Cat IV	0.0130				0.0124			
W.E., 5-Off, *n*-Cat V	0.0130				0.0124			
W.E., 5-Off, *n*-Cat VI	0.0130				0.0124			
W.E., 6-Off, *n*-Cat I	0.0911				0.0870			
W.E., 6-Off, *n*-Cat II	0.0130				0.0124			
W.E., 6-Off, *n*-Cat III	0.0130				0.0124			
W.E., 6-Off, *n*-Cat IV	0.0130				0.0124			
W.E., 6-Off, *n*-Cat V	0.0130				0.0124			
W.E., 6-Off, *n*-Cat VI	0.0130				0.0124			
W.E., 4-Off, *n*-Cat I	0.1041				0.0994			
W.E., 4-Off, *n*-Cat II	0.0130				0.0124			
W.E., 4-Off, *n*-Cat III	0.0130				0.0124			
W.E., 4-Off, *n*-Cat IV	0.0130				0.0124			
W.E., 4-Off, *n*-Cat V	0.0130				0.0124			
W.E., 4-Off, *n*-Cat VI	0.0130				0.0124			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

	What-If Scenario IV				**What-If Scenario V**			
	What Changed? All Wind-Related Weighting Factors Reduced 50% from Original "As-Is" Values.				***What Changed? All Distance-Related Weighting Factors Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0200	1st	Loc. 1-Off	6.6257	0.0138	1st	Loc. 1-Off	6.4269
Distance, LTP	0.2000	2nd	Loc. 2-Off	5.9405	0.1242	2nd	Loc. 4	6.2722
Distance, 5-Off	0.0400	3rd	Loc. 3-Off	5.8926	0.0248	3rd	Loc. 6	6.2707
Distance, 6-Off	0.0400	4th	Loc. 16	5.6616	0.0248	4th	Loc. 16	6.2293
Distance, 4-Off	0.0200	5th	Loc. 4	5.4531	0.0124	5th	Loc. 2-Off	6.2249
Elevation	0.2000	6th	Loc. 6	5.3137	0.1380	6th	Loc. 7	6.1068
W.E., LTP, *n*-Cat I	0.0600	7th	Loc. 7	5.2091	0.0828	7th	Loc. 3-Off	5.9940
W.E., LTP, *n*-Cat II	0.0100	8th	Loc. 3	4.9545	0.0138	8th	Loc. 2	5.7795
W.E., LTP, *n*-Cat III	0.0100	9th	Loc. 2	4.8829	0.0138	9th	Loc. 5	5.7446
W.E., LTP, *n*-Cat IV	0.0100	10th	Loc. 5	4.8798	0.0138	10th	Loc. 3	5.5301
W.E., LTP, *n*-Cat V	0.0100	11th	Loc. 1A	4.8176	0.0138	11th	Loc. 1A	5.4417
W.E., LTP, *n*-Cat VI	0.0100	12th	Loc. 1	4.1366	0.0138	12th	Loc. 1	4.8735
W.E., 5-Off, *n*-Cat I	0.0700				0.0966			
W.E., 5-Off, *n*-Cat II	0.0100				0.0138			
W.E., 5-Off, *n*-Cat III	0.0100				0.0138			
W.E., 5-Off, *n*-Cat IV	0.0100				0.0138			
W.E., 5-Off, *n*-Cat V	0.0100				0.0138			
W.E., 5-Off, *n*-Cat VI	0.0100				0.0138			
W.E., 6-Off, *n*-Cat I	0.0700				0.0966			
W.E., 6-Off, *n*-Cat II	0.0100				0.0138			
W.E., 6-Off, *n*-Cat III	0.0100				0.0138			
W.E., 6-Off, *n*-Cat IV	0.0100				0.0138			
W.E., 6-Off, *n*-Cat V	0.0100				0.0138			
W.E., 6-Off, *n*-Cat VI	0.0100				0.0138			
W.E., 4-Off, *n*-Cat I	0.0800				0.1104			
W.E., 4-Off, *n*-Cat II	0.0100				0.0138			
W.E., 4-Off, *n*-Cat III	0.0100				0.0138			
W.E., 4-Off, *n*-Cat IV	0.0100				0.0138			
W.E., 4-Off, *n*-Cat V	0.0100				0.0138			
W.E., 4-Off, *n*-Cat VI	0.0100				0.0138			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

	What-If Scenario VI				**What-If Scenario VII**			
	What Changed? ***All Distance-Related Weighting Factors Reduced 20% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related Weighting Factors Reduced 50% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0141	1st	Loc. 1-Off	6.4405	0.0150	1st	Loc. 6	6.4997
Distance, LTP	0.1127	2nd	Loc. 6	6.3243	0.0752	2nd	Loc. 1-Off	6.4852
Distance, 5-Off	0.0225	3rd	Loc. 4	6.3061	0.0150	3rd	Loc. 4	6.4172
Distance, 6-Off	0.0225	4th	Loc. 16	6.2286	0.0150	4th	Loc. 7	6.3220
Distance, 4-Off	0.0113	5th	Loc. 2-Off	6.2067	0.0075	5th	Loc. 16	6.2264
Elevation	0.1409	6th	Loc. 7	6.1572	0.1504	6th	Loc. 2-Off	6.1470
W.E., LTP, *n*-Cat I	0.0846	7th	Loc. 3-Off	5.9366	0.0903	7th	Loc. 2	6.0213
W.E., LTP, *n*-Cat II	0.0141	8th	Loc. 2	5.8361	0.0150	8th	Loc. 5	5.9502
W.E., LTP, *n*-Cat III	0.0141	9th	Loc. 5	5.7927	0.0150	9th	Loc. 3-Off	5.7490
W.E., LTP, *n*-Cat IV	0.0141	10th	Loc. 3	5.5718	0.0150	10th	Loc. 3	5.7081
W.E., LTP, *n*-Cat V	0.0141	11th	Loc. 1A	5.4885	0.0150	11th	Loc. 1A	5.6416
W.E., LTP, *n*-Cat VI	0.0141	12th	Loc. 1	4.9247	0.0150	12th	Loc. 1	5.0921
W.E., 5-Off, *n*-Cat I	0.0986				0.1053			
W.E., 5-Off, *n*-Cat II	0.0141				0.0150			
W.E., 5-Off, *n*-Cat III	0.0141				0.0150			
W.E., 5-Off, *n*-Cat IV	0.0141				0.0150			
W.E., 5-Off, *n*-Cat V	0.0141				0.0150			
W.E., 5-Off, *n*-Cat VI	0.0141				0.0150			
W.E., 6-Off, *n*-Cat I	0.0986				0.1053			
W.E., 6-Off, *n*-Cat II	0.0141				0.0150			
W.E., 6-Off, *n*-Cat III	0.0141				0.0150			
W.E., 6-Off, *n*-Cat IV	0.0141				0.0150			
W.E., 6-Off, *n*-Cat V	0.0141				0.0150			
W.E., 6-Off, *n*-Cat VI	0.0141				0.0150			
W.E., 4-Off, *n*-Cat I	0.1127				0.1203			
W.E., 4-Off, *n*-Cat II	0.0141				0.0150			
W.E., 4-Off, *n*-Cat III	0.0141				0.0150			
W.E., 4-Off, *n*-Cat IV	0.0141				0.0150			
W.E., 4-Off, *n*-Cat V	0.0141				0.0150			
W.E., 4-Off, *n*-Cat VI	0.0141				0.0150			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? ***Elevation Weighting Factor Reduced 10% from Original "As-Is" Value.***				**What Changed?** ***Elevation Weighting Factor Reduced 20% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0137	1st	Loc. 1-Off	6.3646	0.0139	1st	Loc. 4	6.3781
Distance, LTP	0.1370	2nd	Loc. 4	6.3079	0.1389	2nd	Loc. 16	6.3751
Distance, 5-Off	0.0274	3rd	Loc. 16	6.3015	0.0278	3rd	Loc. 6	6.3544
Distance, 6-Off	0.0274	4th	Loc. 2-Off	6.2941	0.0278	4th	Loc. 2-Off	6.3471
Distance, 4-Off	0.0137	5th	Loc. 6	6.2859	0.0139	5th	Loc. 1-Off	6.3141
Elevation	0.1233	6th	Loc. 7	6.1217	0.1111	6th	Loc. 3-Off	6.1893
W.E., LTP, *n*-Cat I	0.0822	7th	Loc. 3-Off	6.1182	0.0834	7th	Loc. 7	6.1867
W.E., LTP, *n*-Cat II	0.0137	8th	Loc. 2	5.7804	0.0139	8th	Loc. 2	5.8371
W.E., LTP, *n*-Cat III	0.0137	9th	Loc. 5	5.7585	0.0139	9th	Loc. 5	5.8204
W.E., LTP, *n*-Cat IV	0.0137	10th	Loc. 3	5.5184	0.0139	10th	Loc. 3	5.5474
W.E., LTP, *n*-Cat V	0.0137	11th	Loc. 1A	5.4379	0.0139	11th	Loc. 1A	5.4801
W.E., LTP, *n*-Cat VI	0.0137	12th	Loc. 1	4.8652	0.0139	12th	Loc. 1	4.9070
W.E., 5-Off, *n*-Cat I	0.0959				0.0973			
W.E., 5-Off, *n*-Cat II	0.0137				0.0139			
W.E., 5-Off, *n*-Cat III	0.0137				0.0139			
W.E., 5-Off, *n*-Cat IV	0.0137				0.0139			
W.E., 5-Off, *n*-Cat V	0.0137				0.0139			
W.E., 5-Off, *n*-Cat VI	0.0137				0.0139			
W.E., 6-Off, *n*-Cat I	0.0959				0.0973			
W.E., 6-Off, *n*-Cat II	0.0137				0.0139			
W.E., 6-Off, *n*-Cat III	0.0137				0.0139			
W.E., 6-Off, *n*-Cat IV	0.0137				0.0139			
W.E., 6-Off, *n*-Cat V	0.0137				0.0139			
W.E., 6-Off, *n*-Cat VI	0.0137				0.0139			
W.E., 4-Off, *n*-Cat I	0.1096				0.1111			
W.E., 4-Off, *n*-Cat II	0.0137				0.0139			
W.E., 4-Off, *n*-Cat III	0.0137				0.0139			
W.E., 4-Off, *n*-Cat IV	0.0137				0.0139			
W.E., 4-Off, *n*-Cat V	0.0137				0.0139			
W.E., 4-Off, *n*-Cat VI	0.0137				0.0139			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

	What-If Scenario X				What-If Scenario XI			
	What Changed? *Elevation Weighting Factor Reduced 50% from Original "As-Is" Value.*				What Changed? *Measured C_{Rn-222} Weighting Factor Reduced 10% from Original "As-Is" Value.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
C_{Rn-222}	0.0145	1st	Loc. 16	6.6087	0.0122	1st	Loc. 1-Off	6.4208
Distance, LTP	0.1449	2nd	Loc. 4	6.6011	0.1353	2nd	Loc. 2-Off	6.2494
Distance, 5-Off	0.0290	3rd	Loc. 6	6.5719	0.0270	3rd	Loc. 4	6.2465
Distance, 6-Off	0.0290	4th	Loc. 2-Off	6.5156	0.0270	4th	Loc. 16	6.2367
Distance, 4-Off	0.0145	5th	Loc. 3-Off	6.4149	0.0135	5th	Loc. 6	6.2254
Elevation	0.0725	6th	Loc. 7	6.3931	0.1353	6th	Loc. 7	6.0634
W.E., LTP, *n*-Cat I	0.0870	7th	Loc. 1-Off	6.1539	0.0812	7th	Loc. 3-Off	6.0559
W.E., LTP, *n*-Cat II	0.0145	8th	Loc. 2	6.0171	0.0135	8th	Loc. 2	5.7314
W.E., LTP, *n*-Cat III	0.0145	9th	Loc. 5	6.0166	0.0135	9th	Loc. 5	5.7044
W.E., LTP, *n*-Cat IV	0.0145	10th	Loc. 3	5.6395	0.0135	10th	Loc. 3	5.4955
W.E., LTP, *n*-Cat V	0.0145	11th	Loc. 1A	5.6140	0.0135	11th	Loc. 1A	5.3906
W.E., LTP, *n*-Cat VI	0.0145	12th	Loc. 1	5.0399	0.0135	12th	Loc. 1	4.8291
W.E., 5-Off, *n*-Cat I	0.1015				0.0948			
W.E., 5-Off, *n*-Cat II	0.0145				0.0135			
W.E., 5-Off, *n*-Cat III	0.0145				0.0135			
W.E., 5-Off, *n*-Cat IV	0.0145				0.0135			
W.E., 5-Off, *n*-Cat V	0.0145				0.0135			
W.E., 5-Off, *n*-Cat VI	0.0145				0.0135			
W.E., 6-Off, *n*-Cat I	0.1015				0.0948			
W.E., 6-Off, *n*-Cat II	0.0145				0.0135			
W.E., 6-Off, *n*-Cat III	0.0145				0.0135			
W.E., 6-Off, *n*-Cat IV	0.0145				0.0135			
W.E., 6-Off, *n*-Cat V	0.0145				0.0135			
W.E., 6-Off, *n*-Cat VI	0.0145				0.0135			
W.E., 4-Off, *n*-Cat I	0.1160				0.1083			
W.E., 4-Off, *n*-Cat II	0.0145				0.0135			
W.E., 4-Off, *n*-Cat III	0.0145				0.0135			
W.E., 4-Off, *n*-Cat IV	0.0145				0.0135			
W.E., 4-Off, *n*-Cat V	0.0145				0.0135			
W.E., 4-Off, *n*-Cat VI	0.0145				0.0135			

Table 172 (Cont'd). Sensitivity Analysis for Validated MAUT Model Run.

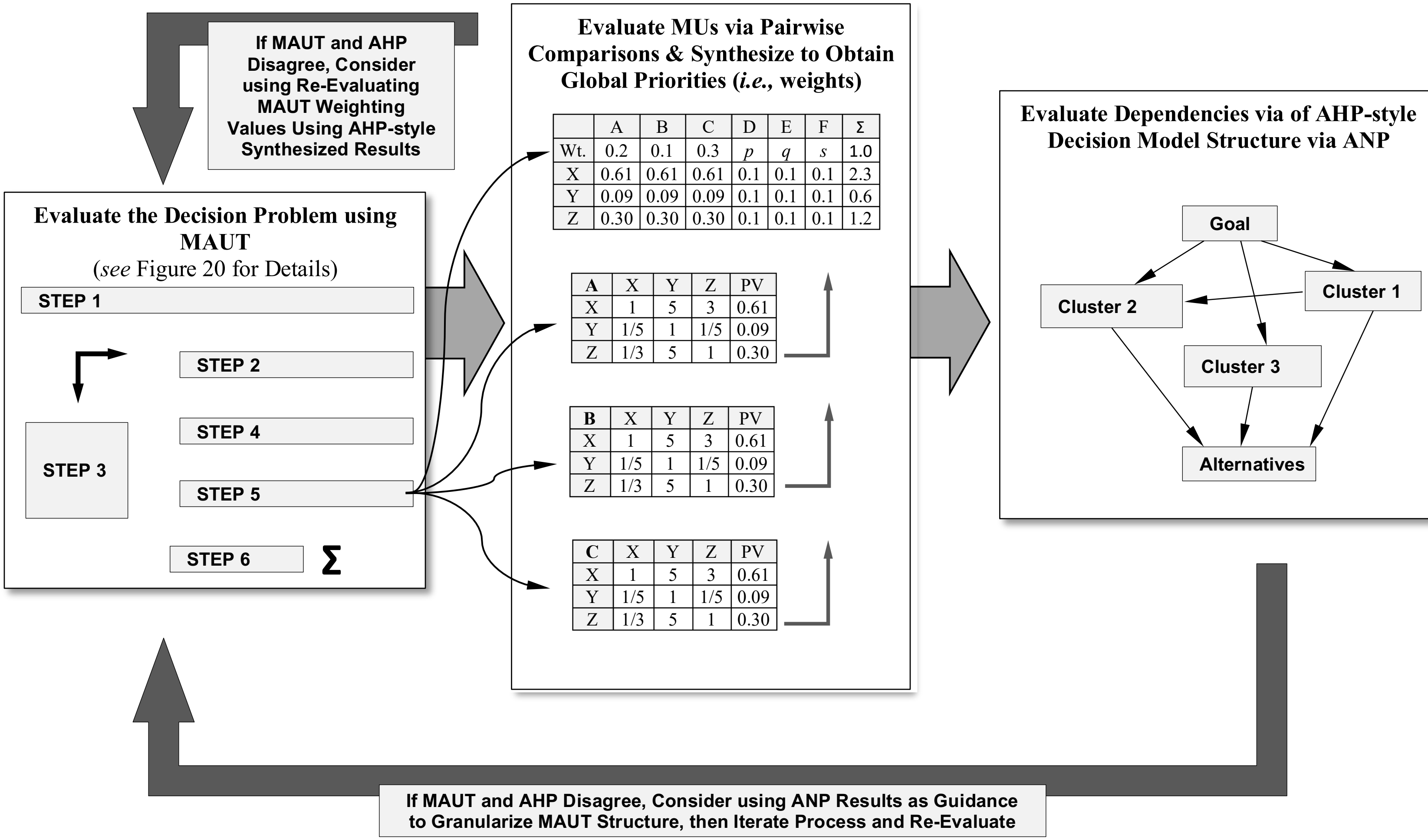
	What-If Scenario XII				**What-If Scenario XIII**			
	What Changed? ***Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 20% from Original "As-Is" Value.***				**What Changed?** ***Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 50% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0108	1st	Loc. 1-Off	6.4278	0.0068	1st	Loc. 1-Off	6.4490
Distance, LTP	0.1355	2nd	Loc. 2-Off	6.2565	0.1361	2nd	Loc. 2-Off	6.2777
Distance, 5-Off	0.0271	3rd	Loc. 4	6.2535	0.0272	3rd	Loc. 4	6.2745
Distance, 6-Off	0.0271	4th	Loc. 16	6.2436	0.0272	4th	Loc. 16	6.2642
Distance, 4-Off	0.0135	5th	Loc. 6	6.2317	0.0136	5th	Loc. 6	6.2504
Elevation	0.1355	6th	Loc. 7	6.0684	0.1361	6th	Loc. 7	6.0834
W.E., LTP, *n*-Cat I	0.0814	7th	Loc. 3-Off	6.0627	0.0817	7th	Loc. 3-Off	6.0833
W.E., LTP, *n*-Cat II	0.0135	8th	Loc. 2	5.7375	0.0136	8th	Loc. 2	5.7562
W.E., LTP, *n*-Cat III	0.0135	9th	Loc. 5	5.7105	0.0136	9th	Loc. 5	5.7287
W.E., LTP, *n*-Cat IV	0.0135	10th	Loc. 3	5.5009	0.0136	10th	Loc. 3	5.5170
W.E., LTP, *n*-Cat V	0.0135	11th	Loc. 1A	5.3844	0.0136	11th	Loc. 1A	5.3655
W.E., LTP, *n*-Cat VI	0.0135	12th	Loc. 1	4.8338	0.0136	12th	Loc. 1	4.8479
W.E., 5-Off, *n*-Cat I	0.0949				0.0953			
W.E., 5-Off, *n*-Cat II	0.0135				0.0136			
W.E., 5-Off, *n*-Cat III	0.0135				0.0136			
W.E., 5-Off, *n*-Cat IV	0.0135				0.0136			
W.E., 5-Off, *n*-Cat V	0.0135				0.0136			
W.E., 5-Off, *n*-Cat VI	0.0135				0.0136			
W.E., 6-Off, *n*-Cat I	0.0949				0.0953			
W.E., 6-Off, *n*-Cat II	0.0135				0.0136			
W.E., 6-Off, *n*-Cat III	0.0135				0.0136			
W.E., 6-Off, *n*-Cat IV	0.0135				0.0136			
W.E., 6-Off, *n*-Cat V	0.0135				0.0136			
W.E., 6-Off, *n*-Cat VI	0.0135				0.0136			
W.E., 4-Off, *n*-Cat I	0.1084				0.1089			
W.E., 4-Off, *n*-Cat II	0.0135				0.0136			
W.E., 4-Off, *n*-Cat III	0.0135				0.0136			
W.E., 4-Off, *n*-Cat IV	0.0135				0.0136			
W.E., 4-Off, *n*-Cat V	0.0135				0.0136			
W.E., 4-Off, *n*-Cat VI	0.0135				0.0136			

The sensitivity analysis above reveals that Locations 2, 5, 3, 1A and 1 are the least preferred alternatives in nearly all the what-if scenarios presented. Similarly, Locations 1-Off, 2-Off, and 16 are often ranked as the most preferred alternatives. The sensitivity analysis reveals that it would require significant bias from one or more criteria to alter the established relationship preferences.

After re-running the MAUT using the global priorities established by the ANP as a guide, it can be seen that alignment between the two models has been achieved; that is to say, both the ANP and the re-evaluated MAUT analyses reveal Location 1-Off to be the most rational choice. The benefit of the Validation Approach is that it provides a means to evaluate a decision problem through the lenses of a three different full-aggregation MCDM techniques; by doing so, the Validation Approach provides a means to ensure the decision problem statement is accurately stated and further, that the thought processes and logic exercised by the decision-maker(s) are consistent. The Validation Approach requires calibration of the models which has been carried out. All of this is slightly different than the other two hybrid models proposed in this dissertation, in which the intent is *not* to run through the models independently but to view the entire effort as a single event (in other words, for the Iterative and ANP Weighting Approaches, the results of at least one of the models directly serve as inputs to at least one of the other models; the element of independent evaluation and calibration is lost in the Iterative and ANP Weighting Approaches).

3.9. MAUT—ANP Hybrid: Testing the Iterative Approach

In accordance with the research method and approach laid out in Section 3.3, this dissertation will now turn its focus to testing the second of the three hybrid models: the Iterative Approach. As explained in Section 3.3 and illustrated in Figure 4, the first step in the Iterative Approach depict the decision-making process pictorially. This is presented in Figure 47 below.



	A	B	C	D	E	F	Σ
Wt.	0.2	0.1	0.3	*p*	*q*	*s*	1.0
X	0.61	0.61	0.61	0.1	0.1	0.1	2.3
Y	0.09	0.09	0.09	0.1	0.1	0.1	0.6
Z	0.30	0.30	0.30	0.1	0.1	0.1	1.2

A	X	Y	Z	PV
X	1	5	3	0.61
Y	1/5	1	1/5	0.09
Z	1/3	5	1	0.30

B	X	Y	Z	PV
X	1	5	3	0.61
Y	1/5	1	1/5	0.09
Z	1/3	5	1	0.30

C	X	Y	Z	PV
X	1	5	3	0.61
Y	1/5	1	1/5	0.09
Z	1/3	5	1	0.30

Figure 47. Iterative Approach Decision Model for Dissertation Problem Statement.

Beginning with the initial MAUT analysis (*i.e.,* the one that indicated Location 6 would be the most rational choice), the next step in the Iterative Approach is to convert the MU values into PVs via AHP-style pairwise comparisons. For the needs of this dissertation, this has been accomplished by using a spreadsheet algorithm in Microsoft Excel that takes the general form illustrated in Figure 48 below.

X-Axis Coordinates→

← Y-Axis Coordinates

	F	G	H	I
53	=Name of Pairwise Comparison			
54	Pairwise Comparison of n = 4 Matrix		Criterion X	Criterion Y
55			Normalized Value for X	Normalized Value Y
56	Criterion X	Normalized Value for X	=IF(OR(($G56-H$55)=0,ABS($G56-H$55)<(0.1*STDEV($H$55:$I$55))),1,IF(($G56-H$55)<0,(1/(ABS($G56-H$55))),$G56-H$55))	=IF(OR(($G56-I$55)=0,ABS($G56-I$55)<(0.1*STDEV($H$55:$I$55))),1,IF(($G56-I$55)<0,(1/(ABS($G56-I$55))),$G56-I$55))
57	Criterion Y	Normalized Value for Y	=1/I56	=IF(OR(($G57-I$55)=0,ABS($G57-I$55)<(0.1*STDEV($H$55:$I$55))),1,IF(($G57-I$55)<0,(1/(ABS($G57-I$55))),$G57-I$55))

Figure 48. Iterative Approach: General Spreadsheet Formula for MU Conversion.

Presentation of the formulas shown in Figure 48 was deemed prudent in the interests of offering a narrative of independent research that can be reproduced. Additionally, the formulas shown in Figure 48 are more sophisticated than those presented in

CHAPTER 2 for completing simple pairwise comparisons. In addition to merely presenting Figure 48, an explanation of the formulas also seems prudent.

The grey-shaded columns and rows should be self-explanatory: The dark grey cells represent the column and row designations, which when combined together, form any given cell's address. The light grey cells contain the names of the criteria under evaluation, in this case, *Criterion X* and *Criterion Y*. The thick black borders around cells H56 and I57 emphasize the fact that these cells lie on the main diagonal of the matrix. If this were a real table (as opposed to a generic example being used for explanatory purposes), the values in Cells G56, G57, H55, and I55 would contain the normalized MU values. As usual, all the cells under the diagonal would be equal to the reciprocal of its counterpart on the opposite side of the diagonal. In this case, and for the sake of simplicity, only one such cell is shown, the cell whose address is H57. The formula contained in this cell is: "=1/I56". The remaining cells are where the real drama lies. Upon close scrutiny, it can be seen that the formulas, while nearly identical, are in fact unique for each cell. As the same concept is applied to each cell, only the formula shown in Cell H56 will be explained. In English, what the formula commands is given as follows: If the difference between the two normalized values equals zero (as would be true for this particular cell since it lies on the diagonal, *i.e., Criterion X* minus *Criterion X* would equal zero), or if the absolute difference between these two criteria is less than 10 percent of the standard deviation of all the normalized values for all the criteria under study, then the entry in this cell will be set to a value of 1. If neither of these are true, then the formula will consider whether or not the difference between the two criteria is negative. If the difference is negative, then the formula will set the entry in this cell equal to the reciprocal of the absolute difference (*i.e.,* the absolute value of the difference) between the two criteria. Finally, if the difference between the two criteria is neither zero, nor negative, nor is the absolute difference between the two criteria less than 10 percent of the standard deviation, then the formula will simply set the entry in this cell equal to the simple mathematical difference between the two criteria, which, by deduction would be a positive number.

The intent behind such a formula is really just meant to subtract one number from another, but the additional rules are necessary for a fairly simple reason: they are intended to produce a matrix with values similar to those that may otherwise be found on Saaty's Scale. In this case, since the mathematical operations require subtraction out to four decimal places, clearly, the resulting answers would rarely be whole numbers or simple fractions. The formulas also serve to more closely align subsequent consistency checks to Saaty's method.

In calculating consistency per the protocols established by Saaty, zeroes "0s" in the matrix tend to complicate matters. Hence the reason why the very first check in the formula is to determine if the difference between the two terms equals zero; and if it is, the formula will set the cell entry equal to 1. The other notable observation that some readers may notice is the use of the standard deviation in the formula. This was done deliberately in an attempt to discriminate against very small values from complicating the consistency calculations. The decision to use "10 percent" of the standard deviation was totally arbitrary. A larger value would discriminate more values, a smaller value would discriminate fewer. To no one's surprise, when very small differences between the two criteria are calculated on one side of the diagonal, very large reciprocal values are produced on the other side. These very large and very small values have a tendency to throw off the consistency matrix.[102]

[102] The degree to which these very small and very large values affect and/or otherwise *complicate* consistency is perhaps a topic for a different dissertation. Discriminating against these values as discussed above is deemed to be sufficient for the needs of this dissertation.

Finally, it should be noted that there would conceivably be several ways to subtract two values and codify the difference to resemble something akin to Saaty's Scale. The method just described was chosen for this dissertation and no assertion is made as to its appropriateness, nor is such an assertion deemed to be relevant to the needs of this dissertation. Of importance, is the fact that *consistent logic* was applied to every AHP-style pairwise comparison in the Iterative Approach. That is to say, use of consistent methods and consistent logic is not believed to hinder the comparison of the various MCDM methods and hybrids herein described.

Since the Iterative Approach begins with a completed MAUT and then proceeds to program MU values into pairwise comparisons, a traditional AHP problem structure is not possible. Via traditional AHP, a problem is structured with from top to bottom beginning with the goal of the decision problem and then flowing down through various subsequent levels (*e.g.,* criteria, sub-criteria, *sub*-sub-criteria, *etc.*). The lowest level in any AHP problem is the one that contains the alternatives. In a MAUT decision problem, identification and consideration of alternatives is among the very first steps to be completed, followed then by defining the common characteristics (*i.e.,* the attributes or criteria[103]) of those alternatives. Additionally, the intent of the Iterative Approach is to mold AHP to the MAUT, not vice versa, hence the reason why the Iterative Approach begins with a completed MAUT. Accordingly, a true AHP problem structure is not obeyed for the Iterative Approach. Rather, the familiar concepts of pairwise comparisons and model synthesis associated with traditional AHP are adapted to fit the MAUT structured decision problem.

Using the MU values presented in Tables Table ***38*** through

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[103] *See* Table 3 and Footnote 26 for clarification of these terms.

Table 47 as the source data and programming them into appropriately sized matrices using the algorithm discussed above in Figure 48, pairwise comparisons were arranged to calculate PVs. These are introduced as follows:

- Tables Table ***174***, Table ***175*** and Table ***176*** depict the pairwise comparison of the MAUT MU values associated with $\boldsymbol{C}_{Rn\text{-}222}$, the derivation of the PVs from that pairwise comparison and the consistency check for the pairwise comparison, respectively.
- Tables Table ***177***, Table ***178*** and Table ***179*** depict the pairwise comparison of the MAUT MU values associated with Distance from the LTP, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***180***, Table ***181*** and Table ***182*** depict the pairwise comparison of the MAUT MU values associated with Distance from 5-Off, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***183***, Table ***184*** and Table ***185*** depict the pairwise comparison of the MAUT MU values associated with Distance from 6-Off, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***186***, Table ***187*** and Table ***188*** depict the pairwise comparison of the MAUT MU values associated with Distance from 4-Off, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.

- Tables Table ***189***, Table ***190*** and Table ***191*** depict the pairwise comparison of the MAUT MU values associated with Elevation, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***192***, Table ***193*** and Table ***194*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of Wind Speed for *n*-Category I, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***195***, Table ***196*** and Table ***197*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of Wind Speed for *n*-Category II, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***198***, Table ***199*** and Table ***200*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of Wind Speed for *n*-Category III, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***201***, Table ***202*** and Table ***203*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of Wind Speed for *n*-Category IV, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***204***, Table ***205*** and Table ***206*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of

Wind Speed for *n*-Category V, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.

- Tables Table ***207***, Table ***208*** and Table ***209*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from the LTP as a function of Wind Speed for *n*-Category VI, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***210***, Table ***211*** and Table ***212*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category I, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***213***, Table ***214*** and Table ***215*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category II, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***216***, Table ***217*** and Table ***218*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category III, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***219***, Table ***220*** and Table ***221*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category IV, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.

- Tables Table ***222***, Table ***223*** and Table ***224*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category V, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***225***, Table ***226*** and Table ***227*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 5-Off as a function of Wind Speed for *n*-Category VI, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***228***, Table ***229*** and Table ***230*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category I, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***231***, Table ***232*** and Table ***233*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category II, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***234***, Table ***235*** and Table ***236*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category III, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***237***, Table ***238*** and Table ***239*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of

Wind Speed for *n*-Category IV, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.

- Tables Table ***240***, Table ***241*** and Table ***242*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category V, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***243***, Table ***244*** and Table ***245***, depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 6-Off as a function of Wind Speed for *n*-Category VI, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***246***, Table ***247*** and Table ***248*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category I, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***249***, Table ***250*** and Table ***251*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category II, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***252***, Table ***253*** and Table ***254*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category III, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.

- Tables Table ***255***, Table ***256*** and Table ***257*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category IV, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***258***, Table ***259*** and Table ***260*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category V, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Tables Table ***261***, Table ***262*** and Table ***263*** depict the pairwise comparison of the MAUT MU values associated with Windward Exposure from 4-Off as a function of Wind Speed for *n*-Category VI, the derivation of the PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Table Table ***264***, Table ***265*** and Table ***266*** depict the pairwise comparison of the MAUT weighting values associated with the entire MAUT analysis, the derivation of PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Table 267 depicts the synthesized model for the Iterative Approach's AHP-style analysis.
- Table 268 presents a summarized listing of the results of the synthesized model for the Iterative Approach's AHP-style analysis.

Table 174. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with $\boldsymbol{C}_{\text{Rn-222}}$.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	1.3707	1.1667	1.5341	1.1078	1.2373	1.6256	2.3802	10.0000	1.2373	1.0559	1.0000	1.1965
1	1.3707	1.0000	1.0000	1.0000	0.2629	1.0000	3.9231	0.9906	0.1159	1.0000	0.3148	0.3707	1.0000
2	1.1667	1.0000	1.0000	2.7218	1.0000	1.0000	2.1791	0.8241	0.1132	1.0000	1.0000	1.0000	1.0000
3	1.5341	1.0000	0.3674	1.0000	0.4263	0.2968	1.0000	1.1819	0.1181	0.2968	0.4782	0.5341	0.3376
4	1.1078	3.8037	1.0000	2.3458	1.0000	1.0000	1.9312	0.7859	0.1125	1.0000	1.0000	1.0000	1.0000
5	1.2373	1.0000	1.0000	3.3693	1.0000	1.0000	2.5753	0.8750	0.1141	1.0000	1.0000	1.0000	1.0000
6	1.6256	0.2549	0.4589	1.0000	0.5178	0.3883	1.0000	1.3252	0.1194	0.3883	0.5697	0.6256	0.4291
7	2.3802	1.0095	1.2135	0.8461	1.2724	1.1429	0.7546	1.0000	0.1312	1.1429	1.3243	1.3802	1.1837
1A	10.0000	8.6293	8.8333	8.4659	8.8922	8.7627	8.3744	7.6198	1.0000	8.7627	8.9441	9.0000	8.8035
1-Off	1.2373	1.0000	1.0000	3.3693	1.0000	1.0000	2.5753	0.8750	0.1141	1.0000	1.0000	1.0000	1.0000
2-Off	1.0559	3.1766	1.0000	2.0912	1.0000	1.0000	1.7553	0.7551	0.1118	1.0000	1.0000	1.0000	1.0000
3-Off	1.0000	2.6976	1.0000	1.8723	1.0000	1.0000	1.5985	0.7245	0.1111	1.0000	1.0000	1.0000	1.0000
16	1.1965	1.0000	1.0000	2.9621	1.0000	1.0000	2.3305	0.8448	0.1136	1.0000	1.0000	1.0000	1.0000
Sum		25.5716	18.8731	31.0437	18.3716	18.5907	29.9974	17.8019	2.2751	18.5907	18.6311	18.9106	18.7539

Table 175. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with $\boldsymbol{C}_{\text{Rn-222}}$.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0391	0.0530	0.0322	0.0143	0.0538	0.1308	0.0556	0.0509	0.0538	0.0169	0.0196	0.0533	0.0478
2	0.0391	0.0530	0.0877	0.0544	0.0538	0.0726	0.0463	0.0498	0.0538	0.0537	0.0529	0.0533	0.0559
3	0.0391	0.0195	0.0322	0.0232	0.0160	0.0333	0.0664	0.0519	0.0160	0.0257	0.0282	0.0180	0.0308
4	0.1487	0.0530	0.0756	0.0544	0.0538	0.0644	0.0441	0.0494	0.0538	0.0537	0.0529	0.0533	0.0631
5	0.0391	0.0530	0.1085	0.0544	0.0538	0.0859	0.0492	0.0502	0.0538	0.0537	0.0529	0.0533	0.0590
6	0.0100	0.0243	0.0322	0.0282	0.0209	0.0333	0.0744	0.0525	0.0209	0.0306	0.0331	0.0229	0.0319
7	0.0395	0.0643	0.0273	0.0693	0.0615	0.0252	0.0562	0.0577	0.0615	0.0711	0.0730	0.0631	0.0558
1A	0.3375	0.4680	0.2727	0.4840	0.4713	0.2792	0.4280	0.4395	0.4713	0.4801	0.4759	0.4694	0.4231
1-Off	0.0391	0.0530	0.1085	0.0544	0.0538	0.0859	0.0492	0.0502	0.0538	0.0537	0.0529	0.0533	0.0590
2-Off	0.1242	0.0530	0.0674	0.0544	0.0538	0.0585	0.0424	0.0491	0.0538	0.0537	0.0529	0.0533	0.0597
3-Off	0.1055	0.0530	0.0603	0.0544	0.0538	0.0533	0.0407	0.0488	0.0538	0.0537	0.0529	0.0533	0.0570
16	0.0391	0.0530	0.0954	0.0544	0.0538	0.0777	0.0475	0.0499	0.0538	0.0537	0.0529	0.0533	0.0570

Table 176. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with $\boldsymbol{C}_{\text{Rn-222}}$.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0478	0.0559	0.0308	0.0631	0.0590	0.0319	0.0558	0.4231	0.0590	0.0597	0.0570	0.0570	1.0000	
1	0.0478	0.0559	0.0308	0.0166	0.0590	0.1253	0.0553	0.0490	0.0590	0.0188	0.0211	0.0570	0.5955	12.4631
2	0.0478	0.0559	0.0838	0.0631	0.0590	0.0696	0.0460	0.0479	0.0590	0.0597	0.0570	0.0570	0.7057	12.6322
3	0.0478	0.0205	0.0308	0.0269	0.0175	0.0319	0.0659	0.0500	0.0175	0.0286	0.0304	0.0193	0.3871	12.5716
4	0.1817	0.0559	0.0722	0.0631	0.0590	0.0617	0.0438	0.0476	0.0590	0.0597	0.0570	0.0570	0.8177	12.9596
5	0.0478	0.0559	0.1037	0.0631	0.0590	0.0823	0.0488	0.0483	0.0590	0.0597	0.0570	0.0570	0.7415	12.5732
6	0.0122	0.0256	0.0308	0.0327	0.0229	0.0319	0.0739	0.0505	0.0229	0.0340	0.0356	0.0245	0.3976	12.4487
7	0.0482	0.0678	0.0261	0.0803	0.0674	0.0241	0.0558	0.0555	0.0674	0.0791	0.0786	0.0675	0.7178	12.8665
1A	0.4123	0.4935	0.2607	0.5611	0.5168	0.2675	0.4251	0.4231	0.5168	0.5341	0.5126	0.5021	5.4255	12.8235
1-Off	0.0478	0.0559	0.1037	0.0631	0.0590	0.0823	0.0488	0.0483	0.0590	0.0597	0.0570	0.0570	0.7415	12.5732
2-Off	0.1518	0.0559	0.0644	0.0631	0.0590	0.0561	0.0421	0.0473	0.0590	0.0597	0.0570	0.0570	0.7723	12.9334
3-Off	0.1289	0.0559	0.0576	0.0631	0.0590	0.0511	0.0404	0.0470	0.0590	0.0597	0.0570	0.0570	0.7356	12.9153
16	0.0478	0.0559	0.0912	0.0631	0.0590	0.0744	0.0471	0.0481	0.0590	0.0597	0.0570	0.0570	0.7192	12.6092

Size of n	12.0000
Sum	152.3696
Sum/n = λ_{max}	12.6975
CI	0.0634
RI	1.4497
CR	0.0437

Table 177. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Distance from the LTP.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	1.0057	1.9028	1.9190	2.4161	1.0000	1.7342	1.5254	2.5952	7.0609	8.6165	10.0000	7.0687
1	1.0057	1.0000	1.1147	1.0949	0.7090	1.0000	1.3727	1.9242	0.6291	0.1651	0.1314	0.1112	0.1649
2	1.9028	0.8971	1.0000	1.0000	1.9482	0.9028	1.0000	0.3774	1.4443	0.1939	0.1489	0.1235	0.1936
3	1.9190	0.9133	1.0000	1.0000	2.0117	0.9190	1.0000	0.3936	1.4789	0.1945	0.1493	0.1237	0.1942
4	2.4161	1.4104	0.5133	0.4971	1.0000	1.4161	0.6819	0.8907	1.0000	0.2153	0.1613	0.1319	0.2149
5	1.0000	1.0000	1.1077	1.0881	0.7062	1.0000	1.3620	1.9033	0.6269	0.1650	0.1313	0.1111	0.1648
6	1.7342	0.7285	1.0000	1.0000	1.4665	0.7342	1.0000	1.0000	1.1614	0.1877	0.1453	0.1210	0.1875
7	1.5254	0.5197	2.6497	2.5407	1.1227	0.5254	1.0000	1.0000	0.9348	0.1807	0.1410	0.1180	0.1804
1A	2.5952	1.5895	0.6924	0.6762	1.0000	1.5952	0.8610	1.0698	1.0000	0.2239	0.1661	0.1350	0.2235
1-Off	7.0609	6.0552	5.1581	5.1419	4.6448	6.0609	5.3267	5.5355	4.4657	1.0000	0.6428	0.3402	1.0000
2-Off	8.6165	7.6108	6.7137	6.6975	6.2004	7.6165	6.8823	7.0911	6.0213	1.5556	1.0000	0.7228	1.5478
3-Off	10.0000	8.9943	8.0972	8.0810	7.5839	9.0000	8.2658	8.4746	7.4048	2.9391	1.3835	1.0000	2.9313
16	7.0687	6.0630	5.1659	5.1497	4.6526	6.0687	5.3345	5.5433	4.4735	1.0000	0.6461	0.3411	1.0000
Sum		36.7818	34.2127	33.9671	33.0459	36.8388	34.0869	35.2035	30.6406	8.0208	4.8470	3.3796	8.0029

Table 178. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Distance from the LTP.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0272	0.0326	0.0322	0.0215	0.0271	0.0403	0.0547	0.0205	0.0206	0.0271	0.0329	0.0206	0.0298
2	0.0244	0.0292	0.0294	0.0590	0.0245	0.0293	0.0107	0.0471	0.0242	0.0307	0.0365	0.0242	0.0308
3	0.0248	0.0292	0.0294	0.0609	0.0249	0.0293	0.0112	0.0483	0.0242	0.0308	0.0366	0.0243	0.0312
4	0.0383	0.0150	0.0146	0.0303	0.0384	0.0200	0.0253	0.0326	0.0268	0.0333	0.0390	0.0269	0.0284
5	0.0272	0.0324	0.0320	0.0214	0.0271	0.0400	0.0541	0.0205	0.0206	0.0271	0.0329	0.0206	0.0296
6	0.0198	0.0292	0.0294	0.0444	0.0199	0.0293	0.0284	0.0379	0.0234	0.0300	0.0358	0.0234	0.0293
7	0.0141	0.0774	0.0748	0.0340	0.0143	0.0293	0.0284	0.0305	0.0225	0.0291	0.0349	0.0225	0.0343
1A	0.0432	0.0202	0.0199	0.0303	0.0433	0.0253	0.0304	0.0326	0.0279	0.0343	0.0400	0.0279	0.0313
1-Off	0.1646	0.1508	0.1514	0.1406	0.1645	0.1563	0.1572	0.1457	0.1247	0.1326	0.1007	0.1250	0.1428
2-Off	0.2069	0.1962	0.1972	0.1876	0.2068	0.2019	0.2014	0.1965	0.1939	0.2063	0.2139	0.1934	0.2002
3-Off	0.2445	0.2367	0.2379	0.2295	0.2443	0.2425	0.2407	0.2417	0.3664	0.2854	0.2959	0.3663	0.2693
16	0.1648	0.1510	0.1516	0.1408	0.1647	0.1565	0.1575	0.1460	0.1247	0.1333	0.1009	0.1250	0.1431

Table 179. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Distance from the LTP.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS/PV**
PV	0.0298	0.0308	0.0312	0.0284	0.0296	0.0293	0.0343	0.0313	0.1428	0.2002	0.2693	0.1431	1.0000	
1	0.0298	0.0343	0.0341	0.0201	0.0296	0.0402	0.0661	0.0197	0.0236	0.0263	0.0299	0.0236	0.3773	12.6725
2	0.0267	0.0308	0.0312	0.0553	0.0268	0.0293	0.0130	0.0452	0.0277	0.0298	0.0333	0.0277	0.3766	12.2343
3	0.0272	0.0308	0.0312	0.0571	0.0272	0.0293	0.0135	0.0462	0.0278	0.0299	0.0333	0.0278	0.3813	12.2322
4	0.0420	0.0158	0.0155	0.0284	0.0420	0.0199	0.0306	0.0313	0.0308	0.0323	0.0355	0.0307	0.3547	12.4977
5	0.0298	0.0341	0.0339	0.0200	0.0296	0.0398	0.0653	0.0196	0.0236	0.0263	0.0299	0.0236	0.3756	12.6707
6	0.0217	0.0308	0.0312	0.0416	0.0218	0.0293	0.0343	0.0363	0.0268	0.0291	0.0326	0.0268	0.3622	12.3828
7	0.0155	0.0816	0.0792	0.0319	0.0156	0.0293	0.0343	0.0292	0.0258	0.0282	0.0318	0.0258	0.4281	12.4708
1A	0.0473	0.0213	0.0211	0.0284	0.0473	0.0252	0.0367	0.0313	0.0320	0.0332	0.0364	0.0320	0.3921	12.5394
1-Off	0.1803	0.1588	0.1603	0.1318	0.1797	0.1558	0.1900	0.1397	0.1428	0.1287	0.0916	0.1431	1.8025	12.6196
2-Off	0.2266	0.2066	0.2088	0.1760	0.2258	0.2013	0.2434	0.1883	0.2222	0.2002	0.1947	0.2214	2.5153	12.5655
3-Off	0.2678	0.2492	0.2519	0.2153	0.2668	0.2418	0.2909	0.2316	0.4198	0.2769	0.2693	0.4194	3.4007	12.6269
16	0.1805	0.1590	0.1605	0.1321	0.1799	0.1560	0.1903	0.1399	0.1428	0.1293	0.0919	0.1431	1.8053	12.6189

Size of *n*	12.0000
Sum	150.1310
Sum/*n* = λ_{max}	12.5109
CI	0.0464
RI	1.4497
CR	0.0320

Table 180. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Distance from 5-Off.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	4.6027	6.1099	8.0278	9.6630	8.1455	6.3883	9.0229	3.3056	4.5272	6.5640	10.0000	1.0000
1	4.6027	1.0000	0.6635	0.2920	0.1976	0.2823	0.5600	0.2262	1.2971	1.0000	0.5099	0.1853	3.6027
2	6.1099	1.5072	1.0000	0.5214	0.2814	0.4913	3.5920	0.3433	2.8043	1.5827	2.2022	0.2571	5.1099
3	8.0278	3.4251	1.9179	1.0000	0.6115	1.0000	1.6395	1.0049	4.7222	3.5006	1.4638	0.5070	7.0278
4	9.6630	5.0603	3.5531	1.6352	1.0000	1.5175	3.2747	0.6401	6.3574	5.1358	3.0990	2.9674	8.6630
5	8.1455	3.5428	2.0356	1.0000	0.6590	1.0000	1.7572	1.1397	4.8399	3.6183	1.5815	0.5392	7.1455
6	6.3883	1.7856	0.2784	0.6099	0.3054	0.5691	1.0000	0.3796	3.0827	1.8611	1.0000	0.2769	5.3883
7	9.0229	4.4202	2.9130	0.9951	1.5623	0.8774	2.6346	1.0000	5.7173	4.4957	2.4589	1.0234	8.0229
1A	3.3056	0.7710	0.3566	0.2118	0.1573	0.2066	0.3244	0.1749	1.0000	0.8186	0.3069	0.1494	2.3056
1-Off	4.5272	1.0000	0.6318	0.2857	0.1947	0.2764	0.5373	0.2224	1.2216	1.0000	0.4910	0.1827	3.5272
2-Off	6.5640	1.9613	0.4541	0.6832	0.3227	0.6323	1.0000	0.4067	3.2584	2.0368	1.0000	0.2910	5.5640
3-Off	10.0000	5.3973	3.8901	1.9722	0.3370	1.8545	3.6117	0.9771	6.6944	5.4728	3.4360	1.0000	9.0000
16	1.0000	0.2776	0.1957	0.1423	0.1154	0.1399	0.1856	0.1246	0.4337	0.2835	0.1797	0.1111	1.0000
Sum		30.1483	17.8898	9.3487	5.7443	8.8473	20.1170	6.6396	41.4290	30.8059	17.7288	7.4905	66.3569

Table 181. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Distance from 5-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0332	0.0371	0.0312	0.0344	0.0319	0.0278	0.0341	0.0313	0.0325	0.0288	0.0247	0.0543	0.0334
2	0.0500	0.0559	0.0558	0.0490	0.0555	0.1786	0.0517	0.0677	0.0514	0.1242	0.0343	0.0770	0.0709
3	0.1136	0.1072	0.1070	0.1065	0.1130	0.0815	0.1514	0.1140	0.1136	0.0826	0.0677	0.1059	0.1053
4	0.1678	0.1986	0.1749	0.1741	0.1715	0.1628	0.0964	0.1535	0.1667	0.1748	0.3961	0.1306	0.1807
5	0.1175	0.1138	0.1070	0.1147	0.1130	0.0873	0.1717	0.1168	0.1175	0.0892	0.0720	0.1077	0.1107
6	0.0592	0.0156	0.0652	0.0532	0.0643	0.0497	0.0572	0.0744	0.0604	0.0564	0.0370	0.0812	0.0561
7	0.1466	0.1628	0.1064	0.2720	0.0992	0.1310	0.1506	0.1380	0.1459	0.1387	0.1366	0.1209	0.1457
1A	0.0256	0.0199	0.0227	0.0274	0.0234	0.0161	0.0263	0.0241	0.0266	0.0173	0.0199	0.0347	0.0237
1-Off	0.0332	0.0353	0.0306	0.0339	0.0312	0.0267	0.0335	0.0295	0.0325	0.0277	0.0244	0.0532	0.0326
2-Off	0.0651	0.0254	0.0731	0.0562	0.0715	0.0497	0.0613	0.0787	0.0661	0.0564	0.0389	0.0838	0.0605
3-Off	0.1790	0.2174	0.2110	0.0587	0.2096	0.1795	0.1472	0.1616	0.1777	0.1938	0.1335	0.1356	0.1670
16	0.0092	0.0109	0.0152	0.0201	0.0158	0.0092	0.0188	0.0105	0.0092	0.0101	0.0148	0.0151	0.0132

Table 182. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Distance from 5-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0334	0.0709	0.1053	0.1807	0.1107	0.0561	0.1457	0.0237	0.0326	0.0605	0.1670	0.0132	1.0000	
1	0.0334	0.0471	0.0308	0.0357	0.0312	0.0314	0.0330	0.0307	0.0326	0.0308	0.0310	0.0477	0.4155	12.4248
2	0.0504	0.0709	0.0549	0.0508	0.0544	0.2017	0.0500	0.0664	0.0516	0.1332	0.0429	0.0677	0.8951	12.6208
3	0.1145	0.1360	0.1053	0.1105	0.1107	0.0921	0.1464	0.1118	0.1142	0.0886	0.0847	0.0931	1.3079	12.4180
4	0.1692	0.2520	0.1722	0.1807	0.1680	0.1839	0.0933	0.1505	0.1676	0.1875	0.4957	0.1148	2.3352	12.9267
5	0.1185	0.1444	0.1053	0.1190	0.1107	0.0987	0.1661	0.1146	0.1181	0.0957	0.0901	0.0947	1.3757	12.4296
6	0.0597	0.0197	0.0642	0.0552	0.0630	0.0561	0.0553	0.0730	0.0607	0.0605	0.0463	0.0714	0.6852	12.2026
7	0.1478	0.2066	0.1048	0.2822	0.0971	0.1479	0.1457	0.1353	0.1467	0.1488	0.1710	0.1063	1.8403	12.6279
1A	0.0258	0.0253	0.0223	0.0284	0.0229	0.0182	0.0255	0.0237	0.0267	0.0186	0.0250	0.0305	0.2928	12.3694
1-Off	0.0334	0.0448	0.0301	0.0352	0.0306	0.0302	0.0324	0.0289	0.0326	0.0297	0.0305	0.0467	0.4052	12.4173
2-Off	0.0656	0.0322	0.0720	0.0583	0.0700	0.0561	0.0593	0.0771	0.0665	0.0605	0.0486	0.0737	0.7399	12.2294
3-Off	0.1805	0.2759	0.2077	0.0609	0.2053	0.2028	0.1424	0.1585	0.1786	0.2079	0.1670	0.1192	2.1066	12.6109
16	0.0093	0.0139	0.0150	0.0209	0.0155	0.0104	0.0182	0.0103	0.0093	0.0109	0.0186	0.0132	0.1653	12.4745

Size of *n*	12.0000
Sum	149.7516
Sum/*n* = λ_{max}	12.4793
CI	0.0436
RI	1.4497
CR	0.0301

Table 183. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Distance from 6-Off.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	5.4160	5.1406	6.7575	10.0000	8.9350	8.5381	8.3780	4.4731	1.0000	1.6342	4.8168	5.6153
1	5.4160	1.0000	1.0000	0.7454	0.2182	0.2842	0.3203	0.3376	0.9429	4.4160	3.7818	0.5992	1.0000
2	5.1406	1.0000	1.0000	0.6185	0.2058	0.2635	0.2943	0.3089	0.6675	4.1406	3.5064	0.3238	2.1066
3	6.7575	1.3415	1.6169	1.0000	0.3084	0.4592	0.5616	0.6171	2.2844	5.7575	5.1233	1.9407	1.1422
4	10.0000	4.5840	4.8594	3.2425	1.0000	1.0650	1.4619	1.6220	5.5269	9.0000	8.3658	5.1832	4.3847
5	8.9350	3.5190	3.7944	2.1775	0.9390	1.0000	0.3969	0.5570	4.4619	7.9350	7.3008	4.1182	3.3197
6	8.5381	3.1221	3.3975	1.7806	0.6840	2.5195	1.0000	1.0000	4.0650	7.5381	6.9039	3.7213	2.9228
7	8.3780	2.9620	3.2374	1.6205	0.6165	1.7953	1.0000	1.0000	3.9049	7.3780	6.7438	3.5612	2.7627
1A	4.4731	1.0606	1.4981	0.4378	0.1809	0.2241	0.2460	0.2561	1.0000	3.4731	2.8389	2.9095	0.8755
1-Off	1.0000	0.2264	0.2415	0.1737	0.1111	0.1260	0.1327	0.1355	0.2879	1.0000	1.5768	0.2620	0.2167
2-Off	1.6342	0.2644	0.2852	0.1952	0.1195	0.1370	0.1448	0.1483	0.3522	0.6342	1.0000	0.3142	0.2512
3-Off	4.8168	1.6689	3.0883	0.5153	0.1929	0.2428	0.2687	0.2808	0.3437	3.8168	3.1826	1.0000	1.2523
16	5.6153	1.0000	0.4747	0.8755	0.2281	0.3012	0.3421	0.3620	1.1422	4.6153	3.9811	0.7985	1.0000
Sum		21.7489	24.4935	13.3824	4.8044	8.4180	6.1694	6.6253	24.9796	59.7046	54.3052	24.7318	21.2344

Table 184. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Distance from 6-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0460	0.0408	0.0557	0.0454	0.0338	0.0519	0.0510	0.0377	0.0740	0.0696	0.0242	0.0471	0.0481
2	0.0460	0.0408	0.0462	0.0428	0.0313	0.0477	0.0466	0.0267	0.0694	0.0646	0.0131	0.0992	0.0479
3	0.0617	0.0660	0.0747	0.0642	0.0546	0.0910	0.0931	0.0915	0.0964	0.0943	0.0785	0.0538	0.0767
4	0.2108	0.1984	0.2423	0.2081	0.1265	0.2370	0.2448	0.2213	0.1507	0.1541	0.2096	0.2065	0.2008
5	0.1618	0.1549	0.1627	0.1954	0.1188	0.0643	0.0841	0.1786	0.1329	0.1344	0.1665	0.1563	0.1426
6	0.1436	0.1387	0.1331	0.1424	0.2993	0.1621	0.1509	0.1627	0.1263	0.1271	0.1505	0.1376	0.1562
7	0.1362	0.1322	0.1211	0.1283	0.2133	0.1621	0.1509	0.1563	0.1236	0.1242	0.1440	0.1301	0.1435
1A	0.0488	0.0612	0.0327	0.0377	0.0266	0.0399	0.0387	0.0400	0.0582	0.0523	0.1176	0.0412	0.0496
1-Off	0.0104	0.0099	0.0130	0.0231	0.0150	0.0215	0.0205	0.0115	0.0167	0.0290	0.0106	0.0102	0.0160
2-Off	0.0122	0.0116	0.0146	0.0249	0.0163	0.0235	0.0224	0.0141	0.0106	0.0184	0.0127	0.0118	0.0161
3-Off	0.0767	0.1261	0.0385	0.0402	0.0288	0.0436	0.0424	0.0138	0.0639	0.0586	0.0404	0.0590	0.0527
16	0.0460	0.0194	0.0654	0.0475	0.0358	0.0555	0.0546	0.0457	0.0773	0.0733	0.0323	0.0471	0.0500

Table 185. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Distance from 6-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0481	0.0479	0.0767	0.2008	0.1426	0.1562	0.1435	0.0496	0.0160	0.0161	0.0527	0.0500	1.0000	
1	0.0481	0.0479	0.0571	0.0438	0.0405	0.0500	0.0485	0.0467	0.0704	0.0608	0.0316	0.0500	0.5955	12.3798
2	0.0481	0.0479	0.0474	0.0413	0.0376	0.0460	0.0443	0.0331	0.0660	0.0564	0.0171	0.1053	0.5905	12.3354
3	0.0645	0.0774	0.0767	0.0619	0.0655	0.0877	0.0886	0.1132	0.0918	0.0824	0.1022	0.0571	0.9691	12.6426
4	0.2205	0.2326	0.2485	0.2008	0.1518	0.2283	0.2328	0.2740	0.1436	0.1346	0.2730	0.2192	2.5597	12.7454
5	0.1693	0.1816	0.1669	0.1886	0.1426	0.0620	0.0799	0.2212	0.1266	0.1175	0.2169	0.1659	1.8389	12.8981
6	0.1502	0.1626	0.1365	0.1374	0.3592	0.1562	0.1435	0.2015	0.1202	0.1111	0.1960	0.1461	2.0205	12.9363
7	0.1425	0.1550	0.1242	0.1238	0.2560	0.1562	0.1435	0.1936	0.1177	0.1085	0.1875	0.1381	1.8466	12.8660
1A	0.0510	0.0717	0.0336	0.0363	0.0320	0.0384	0.0368	0.0496	0.0554	0.0457	0.1532	0.0438	0.6474	13.0609
1-Off	0.0109	0.0116	0.0133	0.0223	0.0180	0.0207	0.0195	0.0143	0.0160	0.0254	0.0138	0.0108	0.1964	12.3151
2-Off	0.0127	0.0137	0.0150	0.0240	0.0195	0.0226	0.0213	0.0175	0.0101	0.0161	0.0165	0.0126	0.2015	12.5266
3-Off	0.0803	0.1478	0.0395	0.0387	0.0346	0.0420	0.0403	0.0170	0.0609	0.0512	0.0527	0.0626	0.6676	12.6772
16	0.0481	0.0227	0.0671	0.0458	0.0429	0.0534	0.0519	0.0566	0.0736	0.0641	0.0421	0.0500	0.6184	12.3712

Size of *n*	12.0000
Sum	151.7546
Sum/*n* = λ_{max}	12.6462
CI	0.0587
RI	1.4497
CR	0.0405

Table 186. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Distance from 4-Off.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	6.6796	4.9670	4.6132	6.4887	7.8420	8.8056	5.7730	6.8946	5.0335	3.7596	1.0000	10.0000
1	6.6796	1.0000	1.7126	2.0664	1.0000	0.8603	0.4704	0.9066	1.0000	1.6461	2.9200	5.6796	0.3012
2	4.9670	0.5839	1.0000	0.3538	0.6572	0.3478	0.2605	1.2407	0.5188	1.0000	1.2074	3.9670	0.1987
3	4.6132	0.4839	2.8265	1.0000	0.5332	0.3097	0.2385	0.8622	0.4383	2.3793	0.8536	3.6132	0.1856
4	6.4887	1.0000	1.5217	1.8755	1.0000	0.7389	0.4316	0.7157	2.4637	1.4552	2.7291	5.4887	0.2848
5	7.8420	1.1624	2.8750	3.2288	1.3533	1.0000	1.0378	2.0690	0.9474	2.8085	4.0824	6.8420	0.4634
6	8.8056	2.1260	3.8386	4.1924	2.3169	0.9636	1.0000	3.0326	1.9110	3.7721	5.0460	7.8056	0.8372
7	5.7730	1.1030	0.8060	1.1598	1.3972	0.4833	0.3298	1.0000	0.8916	0.7395	2.0134	4.7730	0.2366
1A	6.8946	1.0000	1.9276	2.2814	0.4059	1.0555	0.5233	1.1216	1.0000	1.8611	3.1350	5.8946	0.3220
1-Off	5.0335	0.6075	1.0000	0.4203	0.6872	0.3561	0.2651	1.3523	0.5373	1.0000	1.2739	4.0335	0.2013
2-Off	3.7596	0.3425	0.8282	1.1715	0.3664	0.2450	0.1982	0.4967	0.3190	0.7850	1.0000	2.7596	0.1602
3-Off	1.0000	0.1761	0.2521	0.2768	0.1822	0.1462	0.1281	0.2095	0.1696	0.2479	0.3624	1.0000	0.1111
16	10.0000	3.3204	5.0330	5.3868	3.5113	2.1580	1.1944	4.2270	3.1054	4.9665	6.2404	9.0000	1.0000
Sum		12.9057	23.6213	23.4135	13.4108	8.6644	6.0776	17.2339	13.3021	22.6612	30.8636	60.8568	4.3022

Table 187. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Distance from 4-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0775	0.0725	0.0883	0.0746	0.0993	0.0774	0.0526	0.0752	0.0726	0.0946	0.0933	0.0700	0.0790
2	0.0452	0.0423	0.0151	0.0490	0.0401	0.0429	0.0720	0.0390	0.0441	0.0391	0.0652	0.0462	0.0450
3	0.0375	0.1197	0.0427	0.0398	0.0357	0.0392	0.0500	0.0330	0.1050	0.0277	0.0594	0.0431	0.0527
4	0.0775	0.0644	0.0801	0.0746	0.0853	0.0710	0.0415	0.1852	0.0642	0.0884	0.0902	0.0662	0.0824
5	0.0901	0.1217	0.1379	0.1009	0.1154	0.1708	0.1201	0.0712	0.1239	0.1323	0.1124	0.1077	0.1170
6	0.1647	0.1625	0.1791	0.1728	0.1112	0.1645	0.1760	0.1437	0.1665	0.1635	0.1283	0.1946	0.1606
7	0.0855	0.0341	0.0495	0.1042	0.0558	0.0543	0.0580	0.0670	0.0326	0.0652	0.0784	0.0550	0.0616
1A	0.0775	0.0816	0.0974	0.0303	0.1218	0.0861	0.0651	0.0752	0.0821	0.1016	0.0969	0.0748	0.0825
1-Off	0.0471	0.0423	0.0180	0.0512	0.0411	0.0436	0.0785	0.0404	0.0441	0.0413	0.0663	0.0468	0.0467
2-Off	0.0265	0.0351	0.0500	0.0273	0.0283	0.0326	0.0288	0.0240	0.0346	0.0324	0.0453	0.0372	0.0335
3-Off	0.0136	0.0107	0.0118	0.0136	0.0169	0.0211	0.0122	0.0128	0.0109	0.0117	0.0164	0.0258	0.0148
16	0.2573	0.2131	0.2301	0.2618	0.2491	0.1965	0.2453	0.2335	0.2192	0.2022	0.1479	0.2324	0.2240

Table 188. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Distance from 4-Off.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0790	0.0450	0.0527	0.0824	0.1170	0.1606	0.0616	0.0825	0.0467	0.0335	0.0148	0.2240	1.0000	
1	0.0790	0.0771	0.1090	0.0824	0.1007	0.0755	0.0559	0.0825	0.0769	0.0979	0.0840	0.0675	0.9884	12.5129
2	0.0461	0.0450	0.0187	0.0541	0.0407	0.0418	0.0765	0.0428	0.0467	0.0405	0.0587	0.0445	0.5562	12.3524
3	0.0382	0.1273	0.0527	0.0439	0.0362	0.0383	0.0531	0.0362	0.1112	0.0286	0.0535	0.0416	0.6608	12.5324
4	0.0790	0.0685	0.0989	0.0824	0.0865	0.0693	0.0441	0.2033	0.0680	0.0915	0.0812	0.0638	1.0365	12.5810
5	0.0918	0.1294	0.1703	0.1115	0.1170	0.1667	0.1275	0.0782	0.1312	0.1369	0.1012	0.1038	1.4655	12.5226
6	0.1679	0.1728	0.2211	0.1909	0.1128	0.1606	0.1869	0.1577	0.1762	0.1692	0.1155	0.1876	2.0192	12.5722
7	0.0871	0.0363	0.0612	0.1151	0.0566	0.0530	0.0616	0.0736	0.0346	0.0675	0.0706	0.0530	0.7701	12.4931
1A	0.0790	0.0868	0.1203	0.0334	0.1235	0.0840	0.0691	0.0825	0.0870	0.1051	0.0872	0.0721	1.0301	12.4817
1-Off	0.0480	0.0450	0.0222	0.0566	0.0417	0.0426	0.0834	0.0443	0.0467	0.0427	0.0597	0.0451	0.5779	12.3699
2-Off	0.0271	0.0373	0.0618	0.0302	0.0287	0.0318	0.0306	0.0263	0.0367	0.0335	0.0408	0.0359	0.4207	12.5487
3-Off	0.0139	0.0114	0.0146	0.0150	0.0171	0.0206	0.0129	0.0140	0.0116	0.0121	0.0148	0.0249	0.1829	12.3619
16	0.2623	0.2266	0.2841	0.2893	0.2526	0.1918	0.2606	0.2563	0.2320	0.2092	0.1331	0.2240	2.8219	12.5964

Size of *n*	12.0000
Sum	149.9251
Sum/*n* = λ_{max}	12.4938
CI	0.0449
RI	1.4497
CR	0.0310

Table 189. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Elevation.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	1.8514	1.6976	3.4286	1.2515	1.3076	1.3534	1.4400	2.4000	10.0000	2.4727	1.0000	1.0033
1	1.8514	1.0000	1.0000	0.6340	0.5999	0.5438	0.4980	0.4114	1.8228	0.1227	1.6095	0.8514	0.8481
2	1.6976	1.0000	1.0000	0.5777	0.4461	0.3900	0.3442	0.2576	1.4237	0.1204	1.2902	0.6976	0.6943
3	3.4286	1.5772	1.7310	1.0000	2.1771	2.1210	2.0752	1.9886	1.0286	0.1522	0.9559	2.4286	2.4253
4	1.2515	1.6669	2.2416	0.4593	1.0000	1.0000	1.0000	1.0000	0.8707	0.1143	0.8189	0.2515	1.0000
5	1.3076	1.8389	2.5641	0.4715	1.0000	1.0000	1.0000	1.0000	0.9154	0.1150	0.8583	0.3076	0.3043
6	1.3534	2.0080	2.9053	0.4819	1.0000	1.0000	1.0000	1.0000	0.9555	0.1157	0.8934	0.3534	0.3501
7	1.4400	2.4307	3.8820	0.5029	1.0000	1.0000	1.0000	1.0000	1.0417	0.1168	0.9683	0.4400	0.4367
1A	2.4000	0.5486	0.7024	0.9722	1.1485	1.0924	1.0466	0.9600	1.0000	0.1316	1.0000	1.4000	1.3967
1-Off	10.0000	8.1486	8.3024	6.5714	8.7485	8.6924	8.6466	8.5600	7.6000	1.0000	7.5273	9.0000	8.9967
2-Off	2.4727	0.6213	0.7751	1.0461	1.2212	1.1651	1.1193	1.0327	1.0000	0.1328	1.0000	1.4727	1.4694
3-Off	1.0000	1.1745	1.4335	0.4118	3.9761	3.2510	2.8297	2.2727	0.7143	0.1111	0.6790	1.0000	1.0000
16	1.0033	1.1791	1.4403	0.4123	1.0000	3.2862	2.8563	2.2899	0.7160	0.1112	0.6805	1.0000	1.0000
Sum		23.1940	27.9777	13.5411	23.3174	24.5419	23.4159	21.7729	19.0886	2.3439	18.2814	19.2028	19.9216

Table 190. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Elevation.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0431	0.0357	0.0468	0.0257	0.0222	0.0213	0.0189	0.0955	0.0524	0.0880	0.0443	0.0426	0.0447
2	0.0431	0.0357	0.0427	0.0191	0.0159	0.0147	0.0118	0.0746	0.0514	0.0706	0.0363	0.0349	0.0376
3	0.0680	0.0619	0.0738	0.0934	0.0864	0.0886	0.0913	0.0539	0.0649	0.0523	0.1265	0.1217	0.0819
4	0.0719	0.0801	0.0339	0.0429	0.0407	0.0427	0.0459	0.0456	0.0488	0.0448	0.0131	0.0502	0.0467
5	0.0793	0.0916	0.0348	0.0429	0.0407	0.0427	0.0459	0.0480	0.0491	0.0469	0.0160	0.0153	0.0461
6	0.0866	0.1038	0.0356	0.0429	0.0407	0.0427	0.0459	0.0501	0.0493	0.0489	0.0184	0.0176	0.0485
7	0.1048	0.1388	0.0371	0.0429	0.0407	0.0427	0.0459	0.0546	0.0498	0.0530	0.0229	0.0219	0.0546
1A	0.0237	0.0251	0.0718	0.0493	0.0445	0.0447	0.0441	0.0524	0.0561	0.0547	0.0729	0.0701	0.0508
1-Off	0.3513	0.2968	0.4853	0.3752	0.3542	0.3693	0.3931	0.3981	0.4266	0.4117	0.4687	0.4516	0.3985
2-Off	0.0268	0.0277	0.0773	0.0524	0.0475	0.0478	0.0474	0.0524	0.0567	0.0547	0.0767	0.0738	0.0534
3-Off	0.0506	0.0512	0.0304	0.1705	0.1325	0.1208	0.1044	0.0374	0.0474	0.0371	0.0521	0.0502	0.0737
16	0.0508	0.0515	0.0304	0.0429	0.1339	0.1220	0.1052	0.0375	0.0474	0.0372	0.0521	0.0502	0.0634

Table 191. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Elevation.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0447	0.0376	0.0819	0.0467	0.0461	0.0485	0.0546	0.0508	0.3985	0.0534	0.0737	0.0634	1.0000	
1	0.0447	0.0376	0.0519	0.0280	0.0251	0.0242	0.0225	0.0926	0.0489	0.0860	0.0628	0.0538	0.5780	12.9265
2	0.0447	0.0376	0.0473	0.0208	0.0180	0.0167	0.0141	0.0723	0.0480	0.0689	0.0514	0.0440	0.4839	12.8804
3	0.0705	0.0650	0.0819	0.1017	0.0978	0.1007	0.1086	0.0522	0.0606	0.0511	0.1791	0.1538	1.1231	13.7132
4	0.0745	0.0842	0.0376	0.0467	0.0461	0.0485	0.0546	0.0442	0.0456	0.0437	0.0185	0.0634	0.6078	13.0094
5	0.0822	0.0963	0.0386	0.0467	0.0461	0.0485	0.0546	0.0465	0.0458	0.0459	0.0227	0.0193	0.5933	12.8672
6	0.0898	0.1091	0.0395	0.0467	0.0461	0.0485	0.0546	0.0485	0.0461	0.0477	0.0261	0.0222	0.6250	12.8741
7	0.1087	0.1458	0.0412	0.0467	0.0461	0.0485	0.0546	0.0529	0.0466	0.0517	0.0324	0.0277	0.7030	12.8757
1A	0.0245	0.0264	0.0796	0.0537	0.0504	0.0508	0.0524	0.0508	0.0524	0.0534	0.1032	0.0886	0.6862	13.5139
1-Off	0.3643	0.3119	0.5382	0.4087	0.4008	0.4197	0.4674	0.3859	0.3985	0.4021	0.6636	0.5706	5.3318	13.3796
2-Off	0.0278	0.0291	0.0857	0.0571	0.0537	0.0543	0.0564	0.0508	0.0529	0.0534	0.1086	0.0932	0.7230	13.5339
3-Off	0.0525	0.0539	0.0337	0.1858	0.1499	0.1374	0.1241	0.0363	0.0443	0.0363	0.0737	0.0634	0.9912	13.4437
16	0.0527	0.0541	0.0338	0.0467	0.1515	0.1387	0.1250	0.0364	0.0443	0.0364	0.0737	0.0634	0.8567	13.5062

Size of *n*	12.0000
Sum	158.5239
Sum/*n* = λ_{max}	13.2103
CI	0.1100
RI	1.4497
CR	0.0759

Table 192. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	8.1428	9.3046	8.0083	7.6162	1.0000	8.2859	8.3917	8.8382	9.3733	9.3046	10.0000	9.2903
1	8.1428	1.0000	0.8607	1.0000	0.5266	7.1428	1.0000	4.0177	1.4380	0.8127	0.8607	0.5384	0.8715
2	9.3046	1.1618	1.0000	1.2963	1.6884	8.3046	1.0187	0.9129	0.4664	1.0000	1.0000	1.4380	1.0000
3	8.0083	1.0000	0.7714	1.0000	0.3921	7.0083	3.6023	2.6082	1.2050	0.7326	0.7714	0.5021	0.7800
4	7.6162	1.8990	0.5923	2.5504	1.0000	6.6162	1.4932	1.2895	0.8183	0.5691	0.5923	0.4195	0.5973
5	1.0000	0.1400	0.1204	0.1427	0.1511	1.0000	0.1373	0.1353	0.1276	0.1194	0.1204	0.1111	0.1206
6	8.2859	1.0000	0.9816	0.2776	0.6697	7.2859	1.0000	1.0000	1.8106	0.9196	0.9816	0.5834	0.9956
7	8.3917	0.2489	1.0954	0.3834	0.7755	7.3917	1.0000	1.0000	2.2396	1.0187	1.0954	0.6218	1.1128
1A	8.8382	0.6954	2.1441	0.8299	1.2220	7.8382	0.5523	0.4465	1.0000	1.8688	2.1441	0.8607	2.2119
1-Off	9.3733	1.2305	1.0000	1.3650	1.7571	8.3733	1.0874	0.9816	0.5351	1.0000	1.0000	1.5957	1.0000
2-Off	9.3046	1.1618	1.0000	1.2963	1.6884	8.3046	1.0187	0.9129	0.4664	1.0000	1.0000	1.4380	1.0000
3-Off	10.0000	1.8572	0.6954	1.9917	2.3838	9.0000	1.7141	1.6083	1.1618	0.6267	0.6954	1.0000	0.7097
16	9.2903	1.1475	1.0000	1.2820	1.6741	8.2903	1.0044	0.8986	0.4521	1.0000	1.0000	1.4090	1.0000
Sum		12.5421	11.2614	13.4153	13.9288	86.5559	14.6284	15.8115	11.7209	10.6677	11.2614	10.5178	11.3995

Table 193. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category I, 0.5 < *n* < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0797	0.0764	0.0745	0.0378	0.0825	0.0684	0.2541	0.1227	0.0762	0.0764	0.0512	0.0764	0.0897
2	0.0926	0.0888	0.0966	0.1212	0.0959	0.0696	0.0577	0.0398	0.0937	0.0888	0.1367	0.0877	0.0891
3	0.0797	0.0685	0.0745	0.0282	0.0810	0.2463	0.1650	0.1028	0.0687	0.0685	0.0477	0.0684	0.0916
4	0.1514	0.0526	0.1901	0.0718	0.0764	0.1021	0.0816	0.0698	0.0533	0.0526	0.0399	0.0524	0.0828
5	0.0112	0.0107	0.0106	0.0109	0.0116	0.0094	0.0086	0.0109	0.0112	0.0107	0.0106	0.0106	0.0106
6	0.0797	0.0872	0.0207	0.0481	0.0842	0.0684	0.0632	0.1545	0.0862	0.0872	0.0555	0.0873	0.0768
7	0.0198	0.0973	0.0286	0.0557	0.0854	0.0684	0.0632	0.1911	0.0955	0.0973	0.0591	0.0976	0.0799
1A	0.0554	0.1904	0.0619	0.0877	0.0906	0.0378	0.0282	0.0853	0.1752	0.1904	0.0818	0.1940	0.1066
1-Off	0.0981	0.0888	0.1017	0.1261	0.0967	0.0743	0.0621	0.0457	0.0937	0.0888	0.1517	0.0877	0.0930
2-Off	0.0926	0.0888	0.0966	0.1212	0.0959	0.0696	0.0577	0.0398	0.0937	0.0888	0.1367	0.0877	0.0891
3-Off	0.1481	0.0618	0.1485	0.1711	0.1040	0.1172	0.1017	0.0991	0.0587	0.0618	0.0951	0.0623	0.1024
16	0.0915	0.0888	0.0956	0.1202	0.0958	0.0687	0.0568	0.0386	0.0937	0.0888	0.1340	0.0877	0.0883

Table 194. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0897	0.0891	0.0916	0.0828	0.0106	0.0768	0.0799	0.1066	0.0930	0.0891	0.1024	0.0883	1.0000	
1	0.0897	0.0767	0.0916	0.0436	0.0754	0.0768	0.3211	0.1532	0.0756	0.0767	0.0552	0.0770	1.2126	13.5183
2	0.1042	0.0891	0.1187	0.1399	0.0877	0.0783	0.0730	0.0497	0.0930	0.0891	0.1473	0.0883	1.1583	12.9981
3	0.0897	0.0687	0.0916	0.0325	0.0740	0.2768	0.2084	0.1284	0.0681	0.0687	0.0514	0.0689	1.2274	13.3990
4	0.1703	0.0528	0.2336	0.0828	0.0699	0.1147	0.1030	0.0872	0.0529	0.0528	0.0430	0.0528	1.1159	13.4713
5	0.0126	0.0107	0.0131	0.0125	0.0106	0.0105	0.0108	0.0136	0.0111	0.0107	0.0114	0.0107	0.1383	13.0901
6	0.0897	0.0875	0.0254	0.0555	0.0770	0.0768	0.0799	0.1929	0.0855	0.0875	0.0598	0.0880	1.0054	13.0843
7	0.0223	0.0976	0.0351	0.0642	0.0781	0.0768	0.0799	0.2387	0.0947	0.0976	0.0637	0.0983	1.0471	13.1033
1A	0.0624	0.1911	0.0760	0.1012	0.0828	0.0424	0.0357	0.1066	0.1737	0.1911	0.0882	0.1954	1.3466	12.6363
1-Off	0.1104	0.0891	0.1250	0.1455	0.0884	0.0836	0.0784	0.0570	0.0930	0.0891	0.1635	0.0883	1.2114	13.0310
2-Off	0.1042	0.0891	0.1187	0.1399	0.0877	0.0783	0.0730	0.0497	0.0930	0.0891	0.1473	0.0883	1.1583	12.9981
3-Off	0.1666	0.0620	0.1824	0.1975	0.0951	0.1317	0.1285	0.1238	0.0583	0.0620	0.1024	0.0627	1.3730	13.4027
16	0.1029	0.0891	0.1174	0.1387	0.0876	0.0772	0.0718	0.0482	0.0930	0.0891	0.1443	0.0883	1.1477	12.9909

Size of *n*	12.0000
Sum	157.7234
Sum/*n* = λ_{max}	13.1436
CI	0.1040
RI	1.4497
CR	0.0717

Table 195. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	2.3346	9.1066	5.2794	5.0037	1.0000	9.4706	5.3676	3.2279	8.2132	9.1066	10.0000	7.5404
1	2.3346	1.0000	0.1477	0.3396	0.3747	1.3346	0.1401	0.3297	1.1194	0.1701	0.1477	0.1305	0.1921
2	9.1066	6.7720	1.0000	3.8272	4.1029	8.1066	2.7473	3.7390	5.8787	0.8934	1.0000	1.1193	1.5662
3	5.2794	2.9448	0.2613	1.0000	1.0000	4.2794	0.2386	1.0000	2.0515	0.3409	0.2613	0.2118	0.4423
4	5.0037	2.6691	0.2437	1.0000	1.0000	4.0037	0.2239	2.7480	1.7758	0.3116	0.2437	0.2001	0.3942
5	1.0000	0.7493	0.1234	0.2337	0.2498	1.0000	0.1181	0.2290	0.4489	0.1386	0.1234	0.1111	0.1529
6	9.4706	7.1360	0.3640	4.1912	4.4669	8.4706	1.0000	4.1030	6.2427	1.2574	0.3640	1.8889	1.9302
7	5.3676	3.0330	0.2675	1.0000	0.3639	4.3676	0.2437	1.0000	2.1397	0.3514	0.2675	0.2159	0.4602
1A	3.2279	0.8933	0.1701	0.4874	0.5631	2.2279	0.1602	0.4674	1.0000	0.2006	0.1701	0.1477	0.2319
1-Off	8.2132	5.8786	1.1193	2.9338	3.2095	7.2132	0.7953	2.8456	4.9853	1.0000	1.1193	0.5597	0.6728
2-Off	9.1066	6.7720	1.0000	3.8272	4.1029	8.1066	2.7473	3.7390	5.8787	0.8934	1.0000	1.1193	1.5662
3-Off	10.0000	7.6654	0.8934	4.7206	4.9963	9.0000	0.5294	4.6324	6.7721	1.7868	0.8934	1.0000	2.4596
16	7.5404	5.2058	0.6385	2.2610	2.5367	6.5404	0.5181	2.1728	4.3125	1.4863	0.6385	0.4066	1.0000
Sum		50.7193	6.2288	25.8217	26.9667	64.6506	9.4618	27.0058	42.6053	8.8305	6.2288	7.1109	11.0686

Table 196. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0197	0.0237	0.0132	0.0139	0.0206	0.0148	0.0122	0.0263	0.0193	0.0237	0.0183	0.0174	0.0186
2	0.1335	0.1605	0.1482	0.1521	0.1254	0.2904	0.1385	0.1380	0.1012	0.1605	0.1574	0.1415	0.1539
3	0.0581	0.0419	0.0387	0.0371	0.0662	0.0252	0.0370	0.0482	0.0386	0.0419	0.0298	0.0400	0.0419
4	0.0526	0.0391	0.0387	0.0371	0.0619	0.0237	0.1018	0.0417	0.0353	0.0391	0.0281	0.0356	0.0446
5	0.0148	0.0198	0.0090	0.0093	0.0155	0.0125	0.0085	0.0105	0.0157	0.0198	0.0156	0.0138	0.0137
6	0.1407	0.0584	0.1623	0.1656	0.1310	0.1057	0.1519	0.1465	0.1424	0.0584	0.2656	0.1744	0.1419
7	0.0598	0.0429	0.0387	0.0135	0.0676	0.0258	0.0370	0.0502	0.0398	0.0429	0.0304	0.0416	0.0408
1A	0.0176	0.0273	0.0189	0.0209	0.0345	0.0169	0.0173	0.0235	0.0227	0.0273	0.0208	0.0209	0.0224
1-Off	0.1159	0.1797	0.1136	0.1190	0.1116	0.0841	0.1054	0.1170	0.1132	0.1797	0.0787	0.0608	0.1149
2-Off	0.1335	0.1605	0.1482	0.1521	0.1254	0.2904	0.1385	0.1380	0.1012	0.1605	0.1574	0.1415	0.1539
3-Off	0.1511	0.1434	0.1828	0.1853	0.1392	0.0560	0.1715	0.1589	0.2023	0.1434	0.1406	0.2222	0.1581
16	0.1026	0.1025	0.0876	0.0941	0.1012	0.0548	0.0805	0.1012	0.1683	0.1025	0.0572	0.0903	0.0952

Table 197. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0186	0.1539	0.0419	0.0446	0.0137	0.1419	0.0408	0.0224	0.1149	0.1539	0.1581	0.0952	1.0000	
1	0.0186	0.0227	0.0142	0.0167	0.0183	0.0199	0.0135	0.0251	0.0195	0.0227	0.0206	0.0183	0.2302	12.3817
2	0.1259	0.1539	0.1603	0.1828	0.1113	0.3899	0.1527	0.1316	0.1026	0.1539	0.1769	0.1491	1.9912	12.9353
3	0.0547	0.0402	0.0419	0.0446	0.0588	0.0339	0.0408	0.0459	0.0392	0.0402	0.0335	0.0421	0.5158	12.3127
4	0.0496	0.0375	0.0419	0.0446	0.0550	0.0318	0.1123	0.0397	0.0358	0.0375	0.0316	0.0375	0.5548	12.4505
5	0.0139	0.0190	0.0098	0.0111	0.0137	0.0168	0.0094	0.0100	0.0159	0.0190	0.0176	0.0146	0.1708	12.4351
6	0.1327	0.0560	0.1756	0.1991	0.1163	0.1419	0.1676	0.1397	0.1445	0.0560	0.2986	0.1838	1.8118	12.7659
7	0.0564	0.0412	0.0419	0.0162	0.0600	0.0346	0.0408	0.0479	0.0404	0.0412	0.0341	0.0438	0.4985	12.2025
1A	0.0166	0.0262	0.0204	0.0251	0.0306	0.0227	0.0191	0.0224	0.0230	0.0262	0.0233	0.0221	0.2778	12.4099
1-Off	0.1093	0.1723	0.1229	0.1430	0.0991	0.1129	0.1162	0.1116	0.1149	0.1723	0.0885	0.0641	1.4270	12.4206
2-Off	0.1259	0.1539	0.1603	0.1828	0.1113	0.3899	0.1527	0.1316	0.1026	0.1539	0.1769	0.1491	1.9912	12.9353
3-Off	0.1425	0.1375	0.1978	0.2227	0.1236	0.0751	0.1892	0.1516	0.2053	0.1375	0.1581	0.2342	1.9751	12.4944
16	0.0968	0.0983	0.0947	0.1130	0.0898	0.0735	0.0888	0.0965	0.1708	0.0983	0.0643	0.0952	1.1800	12.3915

Size of *n*	12.0000
Sum	150.1354
Sum/*n* = λ_{max}	12.5113
CI	0.0465
RI	1.4497
CR	0.0321

Table 198. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	1.0000	6.9111	2.5209	4.2300	3.1402	10.0000	4.0418	2.5836	7.3345	6.9111	8.4948	5.1159
1	1.0000	1.0000	0.1692	0.6575	0.3096	0.4672	0.1111	0.3288	0.6315	0.1579	0.1692	0.1334	0.2430
2	6.9111	5.9111	1.0000	4.3902	2.6811	3.7709	0.3237	2.8693	4.3275	2.3618	1.0000	0.6314	1.7952
3	2.5209	1.5209	0.2278	1.0000	0.5851	1.6147	0.1337	0.6575	1.0000	0.2077	0.2278	0.1674	0.3854
4	4.2300	3.2300	0.3730	1.7091	1.0000	1.0898	0.1733	1.0000	1.6464	0.3221	0.3730	0.2345	1.1288
5	3.1402	2.1402	0.2652	0.6193	0.9176	1.0000	0.1458	1.1091	0.5566	0.2384	0.2652	0.1868	0.5061
6	10.0000	9.0000	3.0889	7.4791	5.7700	6.8598	1.0000	5.9582	7.4164	2.6655	3.0889	1.5052	4.8841
7	4.0418	3.0418	0.3485	1.5209	1.0000	0.9016	0.1678	1.0000	1.4582	0.3037	0.3485	0.2246	0.9310
1A	2.5836	1.5836	0.2311	1.0000	0.6074	1.7966	0.1348	0.6858	1.0000	0.2105	0.2311	0.1692	0.3949
1-Off	7.3345	6.3345	0.4234	4.8136	3.1045	4.1943	0.3752	3.2927	4.7509	1.0000	0.4234	0.8618	2.2186
2-Off	6.9111	5.9111	1.0000	4.3902	2.6811	3.7709	0.3237	2.8693	4.3275	2.3618	1.0000	0.6314	1.7952
3-Off	8.4948	7.4948	1.5837	5.9739	4.2648	5.3546	0.6644	4.4530	5.9112	1.1603	1.5837	1.0000	3.3789
16	5.1159	4.1159	0.5570	2.5950	0.8859	1.9757	0.2047	1.0741	2.5323	0.4507	0.5570	0.2960	1.0000
Sum		51.2839	9.2678	36.1488	23.8071	32.7962	3.7583	25.2978	35.5585	11.4405	9.2678	6.0417	18.6612

Table 199. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0195	0.0183	0.0182	0.0130	0.0142	0.0296	0.0130	0.0178	0.0138	0.0183	0.0221	0.0130	0.0176
2	0.1153	0.1079	0.1214	0.1126	0.1150	0.0861	0.1134	0.1217	0.2064	0.1079	0.1045	0.0962	0.1174
3	0.0297	0.0246	0.0277	0.0246	0.0492	0.0356	0.0260	0.0281	0.0182	0.0246	0.0277	0.0207	0.0280
4	0.0630	0.0402	0.0473	0.0420	0.0332	0.0461	0.0395	0.0463	0.0282	0.0402	0.0388	0.0605	0.0438
5	0.0417	0.0286	0.0171	0.0385	0.0305	0.0388	0.0438	0.0157	0.0208	0.0286	0.0309	0.0271	0.0302
6	0.1755	0.3333	0.2069	0.2424	0.2092	0.2661	0.2355	0.2086	0.2330	0.3333	0.2491	0.2617	0.2462
7	0.0593	0.0376	0.0421	0.0420	0.0275	0.0447	0.0395	0.0410	0.0265	0.0376	0.0372	0.0499	0.0404
1A	0.0309	0.0249	0.0277	0.0255	0.0548	0.0359	0.0271	0.0281	0.0184	0.0249	0.0280	0.0212	0.0289
1-Off	0.1235	0.0457	0.1332	0.1304	0.1279	0.0998	0.1302	0.1336	0.0874	0.0457	0.1427	0.1189	0.1099
2-Off	0.1153	0.1079	0.1214	0.1126	0.1150	0.0861	0.1134	0.1217	0.2064	0.1079	0.1045	0.0962	0.1174
3-Off	0.1461	0.1709	0.1653	0.1791	0.1633	0.1768	0.1760	0.1662	0.1014	0.1709	0.1655	0.1811	0.1636
16	0.0803	0.0601	0.0718	0.0372	0.0602	0.0545	0.0425	0.0712	0.0394	0.0601	0.0490	0.0536	0.0567

Table 200. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0176	0.1174	0.0280	0.0438	0.0302	0.2462	0.0404	0.0289	0.1099	0.1174	0.1636	0.0567	1.0000	
1	0.0176	0.0199	0.0184	0.0136	0.0141	0.0274	0.0133	0.0183	0.0174	0.0199	0.0218	0.0138	0.2152	12.2596
2	0.1038	0.1174	0.1231	0.1174	0.1138	0.0797	0.1159	0.1253	0.2596	0.1174	0.1033	0.1017	1.4783	12.5948
3	0.0267	0.0267	0.0280	0.0256	0.0487	0.0329	0.0266	0.0289	0.0228	0.0267	0.0274	0.0218	0.3431	12.2341
4	0.0567	0.0438	0.0479	0.0438	0.0329	0.0427	0.0404	0.0477	0.0354	0.0438	0.0383	0.0639	0.5373	12.2724
5	0.0376	0.0311	0.0174	0.0402	0.0302	0.0359	0.0448	0.0161	0.0262	0.0311	0.0305	0.0287	0.3698	12.2490
6	0.1580	0.3626	0.2097	0.2526	0.2071	0.2462	0.2408	0.2147	0.2930	0.3626	0.2462	0.2767	3.0701	12.4693
7	0.0534	0.0409	0.0426	0.0438	0.0272	0.0413	0.0404	0.0422	0.0334	0.0409	0.0367	0.0527	0.4957	12.2664
1A	0.0278	0.0271	0.0280	0.0266	0.0542	0.0332	0.0277	0.0289	0.0231	0.0271	0.0277	0.0224	0.3540	12.2273
1-Off	0.1112	0.0497	0.1350	0.1359	0.1266	0.0924	0.1331	0.1375	0.1099	0.0497	0.1410	0.1257	1.3476	12.2616
2-Off	0.1038	0.1174	0.1231	0.1174	0.1138	0.0797	0.1159	0.1253	0.2596	0.1174	0.1033	0.1017	1.4783	12.5948
3-Off	0.1316	0.1859	0.1675	0.1867	0.1617	0.1636	0.1799	0.1711	0.1275	0.1859	0.1636	0.1914	2.0164	12.3287
16	0.0723	0.0654	0.0728	0.0388	0.0596	0.0504	0.0434	0.0733	0.0495	0.0654	0.0484	0.0567	0.6959	12.2843

Size of *n*	12.0000
Sum	148.0423
Sum/*n* = λ_{max}	12.3369
CI	0.0306
RI	1.4497
CR	0.0211

Table 201. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category IV, $5.7 < n < 8.8$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	1.0000	4.1053	1.3298	8.9969	8.7496	10.0000	7.2244	3.5557	6.3313	4.1053	6.6611	4.8885
1	1.0000	1.0000	0.3220	3.0321	0.1250	0.1290	0.1111	0.1607	0.3913	0.1876	0.3220	0.1766	0.2572
2	4.1053	3.1053	1.0000	2.7755	0.2044	0.2153	0.1696	0.3206	0.5496	0.4492	1.0000	0.3913	1.2768
3	1.3298	0.3298	0.3603	1.0000	0.1304	0.1348	0.1153	0.1696	0.4493	0.1999	0.3603	0.1876	0.2810
4	8.9969	7.9969	4.8916	7.6671	1.0000	1.0000	0.9969	1.7725	5.4412	2.6656	4.8916	2.3358	4.1084
5	8.7496	7.7496	4.6443	7.4198	1.0000	1.0000	0.7997	1.5252	5.1939	2.4183	4.6443	2.0885	3.8611
6	10.0000	9.0000	5.8947	8.6702	1.0031	1.2504	1.0000	2.7756	6.4443	3.6687	5.8947	3.3389	5.1115
7	7.2244	6.2244	3.1191	5.8946	0.5642	0.6557	0.3603	1.0000	3.6687	0.8931	3.1191	0.5633	2.3359
1A	3.5557	2.5557	1.8195	2.2259	0.1838	0.1925	0.1552	0.2726	1.0000	0.3603	1.8195	0.3220	0.7503
1-Off	6.3313	5.3313	2.2260	5.0015	0.3752	0.4135	0.2726	1.1197	2.7756	1.0000	2.2260	3.0321	1.4428
2-Off	4.1053	3.1053	1.0000	2.7755	0.2044	0.2153	0.1696	0.3206	0.5496	0.4492	1.0000	0.3913	1.2768
3-Off	6.6611	5.6611	2.5558	5.3313	0.4281	0.4788	0.2995	1.7753	3.1054	0.3298	2.5558	1.0000	1.7726
16	4.8885	3.8885	0.7832	3.5587	0.2434	0.2590	0.1956	0.4281	1.3328	0.6931	0.7832	0.5641	1.0000
Sum		55.9479	28.6165	55.3522	5.4621	5.9444	4.6456	11.6404	30.9016	13.3149	28.6165	14.3916	23.4744

Table 202. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category IV, 5.7 < n < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0179	0.0113	0.0548	0.0229	0.0217	0.0239	0.0138	0.0127	0.0141	0.0113	0.0123	0.0110	0.0190
2	0.0555	0.0349	0.0501	0.0374	0.0362	0.0365	0.0275	0.0178	0.0337	0.0349	0.0272	0.0544	0.0372
3	0.0059	0.0126	0.0181	0.0239	0.0227	0.0248	0.0146	0.0145	0.0150	0.0126	0.0130	0.0120	0.0158
4	0.1429	0.1709	0.1385	0.1831	0.1682	0.2146	0.1523	0.1761	0.2002	0.1709	0.1623	0.1750	0.1713
5	0.1385	0.1623	0.1340	0.1831	0.1682	0.1722	0.1310	0.1681	0.1816	0.1623	0.1451	0.1645	0.1592
6	0.1609	0.2060	0.1566	0.1836	0.2104	0.2153	0.2384	0.2085	0.2755	0.2060	0.2320	0.2177	0.2093
7	0.1113	0.1090	0.1065	0.1033	0.1103	0.0776	0.0859	0.1187	0.0671	0.1090	0.0391	0.0995	0.0948
1A	0.0457	0.0636	0.0402	0.0336	0.0324	0.0334	0.0234	0.0324	0.0271	0.0636	0.0224	0.0320	0.0375
1-Off	0.0953	0.0778	0.0904	0.0687	0.0696	0.0587	0.0962	0.0898	0.0751	0.0778	0.2107	0.0615	0.0893
2-Off	0.0555	0.0349	0.0501	0.0374	0.0362	0.0365	0.0275	0.0178	0.0337	0.0349	0.0272	0.0544	0.0372
3-Off	0.1012	0.0893	0.0963	0.0784	0.0805	0.0645	0.1525	0.1005	0.0248	0.0893	0.0695	0.0755	0.0852
16	0.0695	0.0274	0.0643	0.0446	0.0436	0.0421	0.0368	0.0431	0.0521	0.0274	0.0392	0.0426	0.0444

Table 203. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category IV, $5.7 < n < 8.8$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0190	0.0372	0.0158	0.1713	0.1592	0.2093	0.0948	0.0375	0.0893	0.0372	0.0852	0.0444	1.0000	
1	0.0190	0.0120	0.0479	0.0214	0.0205	0.0233	0.0152	0.0147	0.0167	0.0120	0.0150	0.0114	0.2291	12.0888
2	0.0589	0.0372	0.0439	0.0350	0.0343	0.0355	0.0304	0.0206	0.0401	0.0372	0.0333	0.0567	0.4630	12.4476
3	0.0063	0.0134	0.0158	0.0223	0.0215	0.0241	0.0161	0.0168	0.0179	0.0134	0.0160	0.0125	0.1960	12.4019
4	0.1516	0.1819	0.1212	0.1713	0.1592	0.2086	0.1680	0.2039	0.2380	0.1819	0.1990	0.1823	2.1669	12.6531
5	0.1469	0.1727	0.1173	0.1713	0.1592	0.1673	0.1445	0.1946	0.2159	0.1727	0.1779	0.1713	2.0119	12.6338
6	0.1706	0.2193	0.1370	0.1718	0.1991	0.2093	0.2630	0.2415	0.3276	0.2193	0.2844	0.2268	2.6697	12.7582
7	0.1180	0.1160	0.0932	0.0966	0.1044	0.0754	0.0948	0.1375	0.0797	0.1160	0.0480	0.1037	1.1832	12.4854
1A	0.0484	0.0677	0.0352	0.0315	0.0307	0.0325	0.0258	0.0375	0.0322	0.0677	0.0274	0.0333	0.4698	12.5368
1-Off	0.1011	0.0828	0.0790	0.0642	0.0658	0.0570	0.1061	0.1040	0.0893	0.0828	0.2583	0.0640	1.1546	12.9315
2-Off	0.0589	0.0372	0.0439	0.0350	0.0343	0.0355	0.0304	0.0206	0.0401	0.0372	0.0333	0.0567	0.4630	12.4476
3-Off	0.1073	0.0951	0.0843	0.0733	0.0762	0.0627	0.1682	0.1164	0.0294	0.0951	0.0852	0.0787	1.0718	12.5816
16	0.0737	0.0291	0.0562	0.0417	0.0412	0.0409	0.0406	0.0499	0.0619	0.0291	0.0481	0.0444	0.5569	12.5493

Size of *n*	12.0000
Sum	150.5155
Sum/*n* = λ_{max}	12.5430
CI	0.0494
RI	1.4497
CR	0.0340

Table 204. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	2.2761	1.0000	1.5373	10.0000	10.0000	10.0000	8.6567	5.9030	5.2985	1.0000	4.5597	6.7090
1	2.2761	1.0000	1.2761	0.7388	0.1295	0.1295	0.1295	0.1567	0.2757	0.3309	1.2761	0.4379	0.2256
2	1.0000	0.7836	1.0000	1.8612	0.1111	0.1111	0.1111	0.1306	0.2040	0.2326	1.0000	0.2809	0.1752
3	1.5373	1.3535	0.5373	1.0000	0.1182	0.1182	0.1182	0.1405	0.2291	0.2659	0.5373	0.3309	0.1934
4	10.0000	7.7239	9.0000	8.4627	1.0000	1.0000	1.0000	1.3433	4.0970	4.7015	9.0000	5.4403	3.2910
5	10.0000	7.7239	9.0000	8.4627	1.0000	1.0000	1.0000	1.3433	4.0970	4.7015	9.0000	5.4403	3.2910
6	10.0000	7.7239	9.0000	8.4627	1.0000	1.0000	1.0000	1.3433	4.0970	4.7015	9.0000	5.4403	3.2910
7	8.6567	6.3806	7.6567	7.1194	0.7444	0.7444	0.7444	1.0000	2.7537	3.3582	7.6567	4.0970	1.9477
1A	5.9030	3.6269	4.9030	4.3657	0.2441	0.2441	0.2441	0.3631	1.0000	0.6045	4.9030	1.3433	1.2407
1-Off	5.2985	3.0224	4.2985	3.7612	0.2127	0.2127	0.2127	0.2978	1.6543	1.0000	4.2985	0.7388	0.7090
2-Off	1.0000	0.7836	1.0000	1.8612	0.1111	0.1111	0.1111	0.1306	0.2040	0.2326	1.0000	0.2809	0.1752
3-Off	4.5597	2.2836	3.5597	3.0224	0.1838	0.1838	0.1838	0.2441	0.7444	1.3535	3.5597	1.0000	0.4653
16	6.7090	4.4329	5.7090	5.1717	0.3039	0.3039	0.3039	0.5134	0.8060	1.4105	5.7090	2.1493	1.0000
Sum		46.8389	56.9403	54.2896	5.1587	5.1587	5.1587	7.0067	20.1621	22.8933	56.9403	26.9799	16.0049

Table 205. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0213	0.0224	0.0136	0.0251	0.0251	0.0251	0.0224	0.0137	0.0145	0.0224	0.0162	0.0141	0.0197
2	0.0167	0.0176	0.0343	0.0215	0.0215	0.0215	0.0186	0.0101	0.0102	0.0176	0.0104	0.0109	0.0176
3	0.0289	0.0094	0.0184	0.0229	0.0229	0.0229	0.0200	0.0114	0.0116	0.0094	0.0123	0.0121	0.0169
4	0.1649	0.1581	0.1559	0.1938	0.1938	0.1938	0.1917	0.2032	0.2054	0.1581	0.2016	0.2056	0.1855
5	0.1649	0.1581	0.1559	0.1938	0.1938	0.1938	0.1917	0.2032	0.2054	0.1581	0.2016	0.2056	0.1855
6	0.1649	0.1581	0.1559	0.1938	0.1938	0.1938	0.1917	0.2032	0.2054	0.1581	0.2016	0.2056	0.1855
7	0.1362	0.1345	0.1311	0.1443	0.1443	0.1443	0.1427	0.1366	0.1467	0.1345	0.1519	0.1217	0.1391
1A	0.0774	0.0861	0.0804	0.0473	0.0473	0.0473	0.0518	0.0496	0.0264	0.0861	0.0498	0.0775	0.0606
1-Off	0.0645	0.0755	0.0693	0.0412	0.0412	0.0412	0.0425	0.0820	0.0437	0.0755	0.0274	0.0443	0.0540
2-Off	0.0167	0.0176	0.0343	0.0215	0.0215	0.0215	0.0186	0.0101	0.0102	0.0176	0.0104	0.0109	0.0176
3-Off	0.0488	0.0625	0.0557	0.0356	0.0356	0.0356	0.0348	0.0369	0.0591	0.0625	0.0371	0.0291	0.0444
16	0.0946	0.1003	0.0953	0.0589	0.0589	0.0589	0.0733	0.0400	0.0616	0.1003	0.0797	0.0625	0.0737

Table 206. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category V, 8.8 < n < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0197	0.0176	0.0169	0.1855	0.1855	0.1855	0.1391	0.0606	0.0540	0.0176	0.0444	0.0737	1.0000	
1	0.0197	0.0224	0.0125	0.0240	0.0240	0.0240	0.0218	0.0167	0.0179	0.0224	0.0195	0.0166	0.2415	12.2856
2	0.0154	0.0176	0.0314	0.0206	0.0206	0.0206	0.0182	0.0124	0.0126	0.0176	0.0125	0.0129	0.2123	12.0704
3	0.0266	0.0094	0.0169	0.0219	0.0219	0.0219	0.0195	0.0139	0.0144	0.0094	0.0147	0.0142	0.2049	12.1529
4	0.1518	0.1583	0.1426	0.1855	0.1855	0.1855	0.1868	0.2483	0.2540	0.1583	0.2418	0.2425	2.3409	12.6194
5	0.1518	0.1583	0.1426	0.1855	0.1855	0.1855	0.1868	0.2483	0.2540	0.1583	0.2418	0.2425	2.3409	12.6194
6	0.1518	0.1583	0.1426	0.1855	0.1855	0.1855	0.1868	0.2483	0.2540	0.1583	0.2418	0.2425	2.3409	12.6194
7	0.1254	0.1346	0.1200	0.1381	0.1381	0.1381	0.1391	0.1669	0.1815	0.1346	0.1821	0.1435	1.7420	12.5266
1A	0.0713	0.0862	0.0736	0.0453	0.0453	0.0453	0.0505	0.0606	0.0327	0.0862	0.0597	0.0914	0.7480	12.3448
1-Off	0.0594	0.0756	0.0634	0.0395	0.0395	0.0395	0.0414	0.1002	0.0540	0.0756	0.0328	0.0522	0.6731	12.4576
2-Off	0.0154	0.0176	0.0314	0.0206	0.0206	0.0206	0.0182	0.0124	0.0126	0.0176	0.0125	0.0129	0.2123	12.0704
3-Off	0.0449	0.0626	0.0509	0.0341	0.0341	0.0341	0.0339	0.0451	0.0731	0.0626	0.0444	0.0343	0.5542	12.4696
16	0.0871	0.1004	0.0872	0.0564	0.0564	0.0564	0.0714	0.0488	0.0762	0.1004	0.0955	0.0737	0.9099	12.3491

Size of *n*	12.0000
Sum	148.5853
Sum/*n* = λ_{max}	12.3821
CI	0.0347
RI	1.4497
CR	0.0240

Table 207. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category VI, n > 11.1 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	3.4286	1.0000	5.3571	10.0000	10.0000	10.0000	10.0000	7.2143	5.2857	1.0000	4.7857	9.0714
1	3.4286	1.0000	2.4286	0.5185	0.1522	0.1522	0.1522	0.1522	0.2642	0.5385	2.4286	0.7369	0.1772
2	1.0000	0.4118	1.0000	0.2295	0.1111	0.1111	0.1111	0.1111	0.1609	0.2333	1.0000	0.2642	0.1239
3	5.3571	1.9285	4.3571	1.0000	0.2154	0.2154	0.2154	0.2154	0.5384	1.0000	4.3571	0.5714	0.2692
4	10.0000	6.5714	9.0000	4.6429	1.0000	1.0000	1.0000	1.0000	2.7857	4.7143	9.0000	5.2143	0.9286
5	10.0000	6.5714	9.0000	4.6429	1.0000	1.0000	1.0000	1.0000	2.7857	4.7143	9.0000	5.2143	0.9286
6	10.0000	6.5714	9.0000	4.6429	1.0000	1.0000	1.0000	1.0000	2.7857	4.7143	9.0000	5.2143	0.9286
7	10.0000	6.5714	9.0000	4.6429	1.0000	1.0000	1.0000	1.0000	2.7857	4.7143	9.0000	5.2143	0.9286
1A	7.2143	3.7857	6.2143	1.8572	0.3590	0.3590	0.3590	0.3590	1.0000	1.9286	6.2143	2.4286	0.5385
1-Off	5.2857	1.8571	4.2857	1.0000	0.2121	0.2121	0.2121	0.2121	0.5185	1.0000	4.2857	0.5000	0.2642
2-Off	1.0000	0.4118	1.0000	0.2295	0.1111	0.1111	0.1111	0.1111	0.1609	0.2333	1.0000	0.2642	0.1239
3-Off	4.7857	1.3571	3.7857	1.7501	0.1918	0.1918	0.1918	0.1918	0.4118	2.0000	3.7857	1.0000	0.2333
16	9.0714	5.6428	8.0714	3.7143	1.0769	1.0769	1.0769	1.0769	1.8571	3.7857	8.0714	4.2857	1.0000
Sum		42.6803	67.1428	28.8707	6.4295	6.4295	6.4295	6.4295	16.0546	29.5766	67.1428	30.9081	6.4446

Table 208. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0234	0.0362	0.0180	0.0237	0.0237	0.0237	0.0237	0.0165	0.0182	0.0362	0.0238	0.0275	0.0245
2	0.0096	0.0149	0.0079	0.0173	0.0173	0.0173	0.0173	0.0100	0.0079	0.0149	0.0085	0.0192	0.0135
3	0.0452	0.0649	0.0346	0.0335	0.0335	0.0335	0.0335	0.0335	0.0338	0.0649	0.0185	0.0418	0.0393
4	0.1540	0.1340	0.1608	0.1555	0.1555	0.1555	0.1555	0.1735	0.1594	0.1340	0.1687	0.1441	0.1542
5	0.1540	0.1340	0.1608	0.1555	0.1555	0.1555	0.1555	0.1735	0.1594	0.1340	0.1687	0.1441	0.1542
6	0.1540	0.1340	0.1608	0.1555	0.1555	0.1555	0.1555	0.1735	0.1594	0.1340	0.1687	0.1441	0.1542
7	0.1540	0.1340	0.1608	0.1555	0.1555	0.1555	0.1555	0.1735	0.1594	0.1340	0.1687	0.1441	0.1542
1A	0.0887	0.0926	0.0643	0.0558	0.0558	0.0558	0.0558	0.0623	0.0652	0.0926	0.0786	0.0836	0.0709
1-Off	0.0435	0.0638	0.0346	0.0330	0.0330	0.0330	0.0330	0.0323	0.0338	0.0638	0.0162	0.0410	0.0384
2-Off	0.0096	0.0149	0.0079	0.0173	0.0173	0.0173	0.0173	0.0100	0.0079	0.0149	0.0085	0.0192	0.0135
3-Off	0.0318	0.0564	0.0606	0.0298	0.0298	0.0298	0.0298	0.0256	0.0676	0.0564	0.0324	0.0362	0.0405
16	0.1322	0.1202	0.1287	0.1675	0.1675	0.1675	0.1675	0.1157	0.1280	0.1202	0.1387	0.1552	0.1424

Table 209. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from the LTP at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0245	0.0135	0.0393	0.1542	0.1542	0.1542	0.1542	0.0709	0.0384	0.0135	0.0405	0.1424	1.0000	
1	0.0245	0.0427	0.0087	0.0282	0.0282	0.0282	0.0212	0.0160	0.0291	0.0427	0.0328	0.0131	0.3154	12.8578
2	0.0081	0.0176	0.0039	0.0206	0.0206	0.0206	0.0155	0.0098	0.0126	0.0176	0.0117	0.0091	0.1676	12.4035
3	0.0379	0.0766	0.0169	0.0400	0.0400	0.0400	0.0300	0.0326	0.0540	0.0766	0.0254	0.0198	0.4897	12.4711
4	0.1292	0.1583	0.0783	0.1855	0.1855	0.1855	0.1391	0.1688	0.2547	0.1583	0.2318	0.0684	1.9432	12.6001
5	0.1292	0.1583	0.0783	0.1855	0.1855	0.1855	0.1391	0.1688	0.2547	0.1583	0.2318	0.0684	1.9432	12.6001
6	0.1292	0.1583	0.0783	0.1855	0.1855	0.1855	0.1391	0.1688	0.2547	0.1583	0.2318	0.0684	1.9432	12.6001
7	0.1292	0.1583	0.0783	0.1855	0.1855	0.1855	0.1391	0.1688	0.2547	0.1583	0.2318	0.0684	1.9432	12.6001
1A	0.0744	0.1093	0.0313	0.0666	0.0666	0.0666	0.0499	0.0606	0.1042	0.1093	0.1079	0.0397	0.8864	12.4979
1-Off	0.0365	0.0754	0.0169	0.0393	0.0393	0.0393	0.0295	0.0314	0.0540	0.0754	0.0222	0.0195	0.4788	12.4615
2-Off	0.0081	0.0176	0.0039	0.0206	0.0206	0.0206	0.0155	0.0098	0.0126	0.0176	0.0117	0.0091	0.1676	12.4035
3-Off	0.0267	0.0666	0.0295	0.0356	0.0356	0.0356	0.0267	0.0250	0.1081	0.0666	0.0444	0.0172	0.5174	12.7662
16	0.1109	0.1419	0.0626	0.1998	0.1998	0.1998	0.1498	0.1125	0.2046	0.1419	0.1905	0.0737	1.7877	12.5545

Size of *n*	12.0000
Sum	150.8163
Sum/*n* = λ_{max}	12.5680
CI	0.0516
RI	1.4497
CR	0.0356

Table 210. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category I, 0.5 < *n* < 2.1 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	3.9072	7.2474	7.2474	10.0000	10.0000	5.2526	10.0000	3.9072	8.1211	8.1211	8.1211	1.0000
1	3.9072	1.0000	0.2994	0.2994	0.1641	0.1641	0.7433	0.1641	1.0000	0.2373	0.2373	0.2373	2.9072
2	7.2474	3.3402	1.0000	1.0000	0.3633	0.3633	1.9948	0.3633	3.3402	1.1446	1.1446	1.1446	6.2474
3	7.2474	3.3402	1.0000	1.0000	0.3633	0.3633	1.9948	0.3633	3.3402	1.1446	1.1446	1.1446	6.2474
4	10.0000	6.0928	2.7526	2.7526	1.0000	1.0000	4.7474	1.0000	6.0928	1.8789	1.8789	1.8789	9.0000
5	10.0000	6.0928	2.7526	2.7526	1.0000	1.0000	4.7474	1.0000	6.0928	1.8789	1.8789	1.8789	9.0000
6	5.2526	1.3454	0.5013	0.5013	0.2106	0.2106	1.0000	0.2106	1.3454	0.3486	0.3486	0.3486	4.2526
7	10.0000	6.0928	2.7526	2.7526	1.0000	1.0000	4.7474	1.0000	6.0928	1.8789	1.8789	1.8789	9.0000
1A	3.9072	1.0000	0.2994	0.2994	0.1641	0.1641	0.7433	0.1641	1.0000	0.2373	0.2373	0.2373	2.9072
1-Off	8.1211	4.2139	0.8737	0.8737	0.5322	0.5322	2.8685	0.5322	4.2139	1.0000	1.0000	1.0000	7.1211
2-Off	8.1211	4.2139	0.8737	0.8737	0.5322	0.5322	2.8685	0.5322	4.2139	1.0000	1.0000	1.0000	7.1211
3-Off	8.1211	4.2139	0.8737	0.8737	0.5322	0.5322	2.8685	0.5322	4.2139	1.0000	1.0000	1.0000	7.1211
16	1.0000	0.3440	0.1601	0.1601	0.1111	0.1111	0.2352	0.1111	0.3440	0.1404	0.1404	0.1404	1.0000
Sum		41.2899	14.1390	14.1390	5.9733	5.9733	29.5590	5.9733	41.2899	11.8895	11.8895	11.8895	71.9251

Table 211. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category I, 0.5 < *n* < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0242	0.0212	0.0212	0.0275	0.0275	0.0251	0.0275	0.0242	0.0200	0.0200	0.0200	0.0404	0.0249
2	0.0809	0.0707	0.0707	0.0608	0.0608	0.0675	0.0608	0.0809	0.0963	0.0963	0.0963	0.0869	0.0774
3	0.0809	0.0707	0.0707	0.0608	0.0608	0.0675	0.0608	0.0809	0.0963	0.0963	0.0963	0.0869	0.0774
4	0.1476	0.1947	0.1947	0.1674	0.1674	0.1606	0.1674	0.1476	0.1580	0.1580	0.1580	0.1251	0.1622
5	0.1476	0.1947	0.1947	0.1674	0.1674	0.1606	0.1674	0.1476	0.1580	0.1580	0.1580	0.1251	0.1622
6	0.0326	0.0355	0.0355	0.0353	0.0353	0.0338	0.0353	0.0326	0.0293	0.0293	0.0293	0.0591	0.0352
7	0.1476	0.1947	0.1947	0.1674	0.1674	0.1606	0.1674	0.1476	0.1580	0.1580	0.1580	0.1251	0.1622
1A	0.0242	0.0212	0.0212	0.0275	0.0275	0.0251	0.0275	0.0242	0.0200	0.0200	0.0200	0.0404	0.0249
1-Off	0.1021	0.0618	0.0618	0.0891	0.0891	0.0970	0.0891	0.1021	0.0841	0.0841	0.0841	0.0990	0.0869
2-Off	0.1021	0.0618	0.0618	0.0891	0.0891	0.0970	0.0891	0.1021	0.0841	0.0841	0.0841	0.0990	0.0869
3-Off	0.1021	0.0618	0.0618	0.0891	0.0891	0.0970	0.0891	0.1021	0.0841	0.0841	0.0841	0.0990	0.0869
16	0.0083	0.0113	0.0113	0.0186	0.0186	0.0080	0.0186	0.0083	0.0118	0.0118	0.0118	0.0139	0.0127

Table 212. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0249	0.0774	0.0774	0.1622	0.1622	0.0352	0.1622	0.0249	0.0869	0.0869	0.0869	0.0127	1.0000	
1	0.0249	0.0232	0.0232	0.0266	0.0266	0.0262	0.0266	0.0249	0.0206	0.0206	0.0206	0.0369	0.3010	12.0941
2	0.0831	0.0774	0.0774	0.0589	0.0589	0.0703	0.0589	0.0831	0.0995	0.0995	0.0995	0.0793	0.9460	12.2221
3	0.0831	0.0774	0.0774	0.0589	0.0589	0.0703	0.0589	0.0831	0.0995	0.0995	0.0995	0.0793	0.9460	12.2221
4	0.1516	0.2131	0.2131	0.1622	0.1622	0.1673	0.1622	0.1516	0.1634	0.1634	0.1634	0.1143	1.9877	12.2537
5	0.1516	0.2131	0.2131	0.1622	0.1622	0.1673	0.1622	0.1516	0.1634	0.1634	0.1634	0.1143	1.9877	12.2537
6	0.0335	0.0388	0.0388	0.0342	0.0342	0.0352	0.0342	0.0335	0.0303	0.0303	0.0303	0.0540	0.4273	12.1267
7	0.1516	0.2131	0.2131	0.1622	0.1622	0.1673	0.1622	0.1516	0.1634	0.1634	0.1634	0.1143	1.9877	12.2537
1A	0.0249	0.0232	0.0232	0.0266	0.0266	0.0262	0.0266	0.0249	0.0206	0.0206	0.0206	0.0369	0.3010	12.0941
1-Off	0.1049	0.0676	0.0676	0.0863	0.0863	0.1011	0.0863	0.1049	0.0869	0.0869	0.0869	0.0904	1.0564	12.1493
2-Off	0.1049	0.0676	0.0676	0.0863	0.0863	0.1011	0.0863	0.1049	0.0869	0.0869	0.0869	0.0904	1.0564	12.1493
3-Off	0.1049	0.0676	0.0676	0.0863	0.0863	0.1011	0.0863	0.1049	0.0869	0.0869	0.0869	0.0904	1.0564	12.1493
16	0.0086	0.0124	0.0124	0.0180	0.0180	0.0083	0.0180	0.0086	0.0122	0.0122	0.0122	0.0127	0.1536	12.0935

Size of *n*	12.0000
Sum	146.0618
Sum/*n* = λ_{max}	12.1718
CI	0.0156
RI	1.4497
CR	0.0108

Table 213. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	1.0000	4.9162	4.9162	10.0000	10.0000	4.7725	10.0000	1.0000	8.2575	8.2575	8.2575	6.3713
1	1.0000	1.0000	0.2553	0.2553	0.1111	0.1111	0.2651	0.1111	1.0000	0.1378	0.1378	0.1378	0.1862
2	4.9162	3.9162	1.0000	1.0000	0.1967	0.1967	1.0000	0.1967	3.9162	0.2993	0.2993	0.2993	0.6872
3	4.9162	3.9162	1.0000	1.0000	0.1967	0.1967	1.0000	0.1967	3.9162	0.2993	0.2993	0.2993	0.6872
4	10.0000	9.0000	5.0838	5.0838	1.0000	1.0000	5.2275	1.0000	9.0000	1.7425	1.7425	1.7425	3.6287
5	10.0000	9.0000	5.0838	5.0838	1.0000	1.0000	5.2275	1.0000	9.0000	1.7425	1.7425	1.7425	3.6287
6	4.7725	3.7725	1.0000	1.0000	0.1913	0.1913	1.0000	0.1913	3.7725	0.2869	0.2869	0.2869	0.6255
7	10.0000	9.0000	5.0838	5.0838	1.0000	1.0000	5.2275	1.0000	9.0000	1.7425	1.7425	1.7425	3.6287
1A	1.0000	1.0000	0.2553	0.2553	0.1111	0.1111	0.2651	0.1111	1.0000	0.1378	0.1378	0.1378	0.1862
1-Off	8.2575	7.2575	3.3413	3.3413	0.5739	0.5739	3.4850	0.5739	7.2575	1.0000	1.0000	1.0000	1.8862
2-Off	8.2575	7.2575	3.3413	3.3413	0.5739	0.5739	3.4850	0.5739	7.2575	1.0000	1.0000	1.0000	1.8862
3-Off	8.2575	7.2575	3.3413	3.3413	0.5739	0.5739	3.4850	0.5739	7.2575	1.0000	1.0000	1.0000	1.8862
16	6.3713	5.3713	1.4551	1.4551	0.2756	0.2756	1.5988	0.2756	5.3713	0.5302	0.5302	0.5302	1.0000
Sum		67.7487	30.2411	30.2411	5.8042	5.8042	31.2665	5.8042	67.7487	9.9188	9.9188	9.9188	19.9170

Table 214. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0148	0.0084	0.0084	0.0191	0.0191	0.0085	0.0191	0.0148	0.0139	0.0139	0.0139	0.0093	0.0136
2	0.0578	0.0331	0.0331	0.0339	0.0339	0.0320	0.0339	0.0578	0.0302	0.0302	0.0302	0.0345	0.0367
3	0.0578	0.0331	0.0331	0.0339	0.0339	0.0320	0.0339	0.0578	0.0302	0.0302	0.0302	0.0345	0.0367
4	0.1328	0.1681	0.1681	0.1723	0.1723	0.1672	0.1723	0.1328	0.1757	0.1757	0.1757	0.1822	0.1663
5	0.1328	0.1681	0.1681	0.1723	0.1723	0.1672	0.1723	0.1328	0.1757	0.1757	0.1757	0.1822	0.1663
6	0.0557	0.0331	0.0331	0.0330	0.0330	0.0320	0.0330	0.0557	0.0289	0.0289	0.0289	0.0314	0.0355
7	0.1328	0.1681	0.1681	0.1723	0.1723	0.1672	0.1723	0.1328	0.1757	0.1757	0.1757	0.1822	0.1663
1A	0.0148	0.0084	0.0084	0.0191	0.0191	0.0085	0.0191	0.0148	0.0139	0.0139	0.0139	0.0093	0.0136
1-Off	0.1071	0.1105	0.1105	0.0989	0.0989	0.1115	0.0989	0.1071	0.1008	0.1008	0.1008	0.0947	0.1034
2-Off	0.1071	0.1105	0.1105	0.0989	0.0989	0.1115	0.0989	0.1071	0.1008	0.1008	0.1008	0.0947	0.1034
3-Off	0.1071	0.1105	0.1105	0.0989	0.0989	0.1115	0.0989	0.1071	0.1008	0.1008	0.1008	0.0947	0.1034
16	0.0793	0.0481	0.0481	0.0475	0.0475	0.0511	0.0475	0.0793	0.0535	0.0535	0.0535	0.0502	0.0549

Table 215. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0136	0.0367	0.0367	0.1663	0.1663	0.0355	0.1663	0.0136	0.1034	0.1034	0.1034	0.0549	1.0000	
1	0.0136	0.0094	0.0094	0.0185	0.0185	0.0094	0.0185	0.0136	0.0142	0.0142	0.0142	0.0102	0.1638	12.0313
2	0.0533	0.0367	0.0367	0.0327	0.0327	0.0355	0.0327	0.0533	0.0309	0.0309	0.0309	0.0377	0.4442	12.1036
3	0.0533	0.0367	0.0367	0.0327	0.0327	0.0355	0.0327	0.0533	0.0309	0.0309	0.0309	0.0377	0.4442	12.1036
4	0.1225	0.1866	0.1866	0.1663	0.1663	0.1858	0.1663	0.1225	0.1801	0.1801	0.1801	0.1993	2.0424	12.2841
5	0.1225	0.1866	0.1866	0.1663	0.1663	0.1858	0.1663	0.1225	0.1801	0.1801	0.1801	0.1993	2.0424	12.2841
6	0.0513	0.0367	0.0367	0.0318	0.0318	0.0355	0.0318	0.0513	0.0297	0.0297	0.0297	0.0343	0.4304	12.1082
7	0.1225	0.1866	0.1866	0.1663	0.1663	0.1858	0.1663	0.1225	0.1801	0.1801	0.1801	0.1993	2.0424	12.2841
1A	0.0136	0.0094	0.0094	0.0185	0.0185	0.0094	0.0185	0.0136	0.0142	0.0142	0.0142	0.0102	0.1638	12.0313
1-Off	0.0988	0.1226	0.1226	0.0954	0.0954	0.1239	0.0954	0.0988	0.1034	0.1034	0.1034	0.1036	1.2667	12.2533
2-Off	0.0988	0.1226	0.1226	0.0954	0.0954	0.1239	0.0954	0.0988	0.1034	0.1034	0.1034	0.1036	1.2667	12.2533
3-Off	0.0988	0.1226	0.1226	0.0954	0.0954	0.1239	0.0954	0.0988	0.1034	0.1034	0.1034	0.1036	1.2667	12.2533
16	0.0731	0.0534	0.0534	0.0458	0.0458	0.0568	0.0458	0.0731	0.0548	0.0548	0.0548	0.0549	0.6666	12.1405

Size of *n*	12.0000
Sum	146.1310
Sum/*n* = λ_{max}	12.1776
CI	0.0161
RI	1.4497
CR	0.0111

Table 216. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category III, 3.6 < n < 5.7 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	1.0000	6.0969	6.0969	10.0000	10.0000	6.2921	10.0000	1.0000	6.0969	6.0969	6.0969	9.6327
1	1.0000	1.0000	0.1962	0.1962	0.1111	0.1111	0.1890	0.1111	1.0000	0.1962	0.1962	0.1962	0.1158
2	6.0969	5.0969	1.0000	1.0000	0.2562	0.2562	1.0000	0.2562	5.0969	1.0000	1.0000	1.0000	0.2828
3	6.0969	5.0969	1.0000	1.0000	0.2562	0.2562	1.0000	0.2562	5.0969	1.0000	1.0000	1.0000	0.2828
4	10.0000	9.0000	3.9031	3.9031	1.0000	1.0000	3.7079	1.0000	9.0000	3.9031	3.9031	3.9031	0.3673
5	10.0000	9.0000	3.9031	3.9031	1.0000	1.0000	3.7079	1.0000	9.0000	3.9031	3.9031	3.9031	0.3673
6	6.2921	5.2921	1.0000	1.0000	0.2697	0.2697	1.0000	0.2697	5.2921	1.0000	1.0000	1.0000	0.2993
7	10.0000	9.0000	3.9031	3.9031	1.0000	1.0000	3.7079	1.0000	9.0000	3.9031	3.9031	3.9031	0.3673
1A	1.0000	1.0000	0.1962	0.1962	0.1111	0.1111	0.1890	0.1111	1.0000	0.1962	0.1962	0.1962	0.1158
1-Off	6.0969	5.0969	1.0000	1.0000	0.2562	0.2562	1.0000	0.2562	5.0969	1.0000	1.0000	1.0000	0.2828
2-Off	6.0969	5.0969	1.0000	1.0000	0.2562	0.2562	1.0000	0.2562	5.0969	1.0000	1.0000	1.0000	0.2828
3-Off	6.0969	5.0969	1.0000	1.0000	0.2562	0.2562	1.0000	0.2562	5.0969	1.0000	1.0000	1.0000	0.2828
16	9.6327	8.6327	3.5358	3.5358	2.7226	2.7226	3.3406	2.7226	8.6327	3.5358	3.5358	3.5358	1.0000
Sum		68.4093	21.6375	21.6375	7.4955	7.4955	20.8422	7.4955	68.4093	21.6375	21.6375	21.6375	4.0470

Table 217. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0146	0.0091	0.0091	0.0148	0.0148	0.0091	0.0148	0.0146	0.0091	0.0091	0.0091	0.0286	0.0131
2	0.0745	0.0462	0.0462	0.0342	0.0342	0.0480	0.0342	0.0745	0.0462	0.0462	0.0462	0.0699	0.0500
3	0.0745	0.0462	0.0462	0.0342	0.0342	0.0480	0.0342	0.0745	0.0462	0.0462	0.0462	0.0699	0.0500
4	0.1316	0.1804	0.1804	0.1334	0.1334	0.1779	0.1334	0.1316	0.1804	0.1804	0.1804	0.0908	0.1528
5	0.1316	0.1804	0.1804	0.1334	0.1334	0.1779	0.1334	0.1316	0.1804	0.1804	0.1804	0.0908	0.1528
6	0.0774	0.0462	0.0462	0.0360	0.0360	0.0480	0.0360	0.0774	0.0462	0.0462	0.0462	0.0740	0.0513
7	0.1316	0.1804	0.1804	0.1334	0.1334	0.1779	0.1334	0.1316	0.1804	0.1804	0.1804	0.0908	0.1528
1A	0.0146	0.0091	0.0091	0.0148	0.0148	0.0091	0.0148	0.0146	0.0091	0.0091	0.0091	0.0286	0.0131
1-Off	0.0745	0.0462	0.0462	0.0342	0.0342	0.0480	0.0342	0.0745	0.0462	0.0462	0.0462	0.0699	0.0500
2-Off	0.0745	0.0462	0.0462	0.0342	0.0342	0.0480	0.0342	0.0745	0.0462	0.0462	0.0462	0.0699	0.0500
3-Off	0.0745	0.0462	0.0462	0.0342	0.0342	0.0480	0.0342	0.0745	0.0462	0.0462	0.0462	0.0699	0.0500
16	0.1262	0.1634	0.1634	0.3632	0.3632	0.1603	0.3632	0.1262	0.1634	0.1634	0.1634	0.2471	0.2139

Table 218. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0131	0.0500	0.0500	0.1528	0.1528	0.0513	0.1528	0.0131	0.0500	0.0500	0.0500	0.2139	1.0000	
1	0.0131	0.0098	0.0098	0.0170	0.0170	0.0097	0.0170	0.0131	0.0098	0.0098	0.0098	0.0248	0.1606	12.2980
2	0.0666	0.0500	0.0500	0.0392	0.0392	0.0513	0.0392	0.0666	0.0500	0.0500	0.0500	0.0605	0.6126	12.2421
3	0.0666	0.0500	0.0500	0.0392	0.0392	0.0513	0.0392	0.0666	0.0500	0.0500	0.0500	0.0605	0.6126	12.2421
4	0.1176	0.1953	0.1953	0.1528	0.1528	0.1902	0.1528	0.1176	0.1953	0.1953	0.1953	0.0786	1.9390	12.6872
5	0.1176	0.1953	0.1953	0.1528	0.1528	0.1902	0.1528	0.1176	0.1953	0.1953	0.1953	0.0786	1.9390	12.6872
6	0.0691	0.0500	0.0500	0.0412	0.0412	0.0513	0.0412	0.0691	0.0500	0.0500	0.0500	0.0640	0.6274	12.2289
7	0.1176	0.1953	0.1953	0.1528	0.1528	0.1902	0.1528	0.1176	0.1953	0.1953	0.1953	0.0786	1.9390	12.6872
1A	0.0131	0.0098	0.0098	0.0170	0.0170	0.0097	0.0170	0.0131	0.0098	0.0098	0.0098	0.0248	0.1606	12.2980
1-Off	0.0666	0.0500	0.0500	0.0392	0.0392	0.0513	0.0392	0.0666	0.0500	0.0500	0.0500	0.0605	0.6126	12.2421
2-Off	0.0666	0.0500	0.0500	0.0392	0.0392	0.0513	0.0392	0.0666	0.0500	0.0500	0.0500	0.0605	0.6126	12.2421
3-Off	0.0666	0.0500	0.0500	0.0392	0.0392	0.0513	0.0392	0.0666	0.0500	0.0500	0.0500	0.0605	0.6126	12.2421
16	0.1128	0.1769	0.1769	0.4161	0.4161	0.1714	0.4161	0.1128	0.1769	0.1769	0.1769	0.2139	2.7437	12.8287

Size of *n*	12.0000
Sum	148.9255
Sum/*n* = λ_{max}	12.4105
CI	0.0373
RI	1.4497
CR	0.0257

Table 219. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	4.0782	5.2508	5.2508	10.0000	10.0000	9.0619	10.0000	4.0782	1.0000	1.0000	1.0000	10.0000
1	4.0782	1.0000	0.8528	0.8528	0.1689	0.1689	0.2007	0.1689	1.0000	3.0782	3.0782	3.0782	0.1689
2	5.2508	1.1726	1.0000	1.0000	0.2106	0.2106	0.2624	0.2106	1.1726	4.2508	4.2508	4.2508	0.2106
3	5.2508	1.1726	1.0000	1.0000	0.2106	0.2106	0.2624	0.2106	1.1726	4.2508	4.2508	4.2508	0.2106
4	10.0000	5.9218	4.7492	4.7492	1.0000	1.0000	0.9381	1.0000	5.9218	9.0000	9.0000	9.0000	1.0000
5	10.0000	5.9218	4.7492	4.7492	1.0000	1.0000	0.9381	1.0000	5.9218	9.0000	9.0000	9.0000	1.0000
6	9.0619	4.9837	3.8111	3.8111	1.0660	1.0660	1.0000	1.0660	4.9837	8.0619	8.0619	8.0619	1.0660
7	10.0000	5.9218	4.7492	4.7492	1.0000	1.0000	0.9381	1.0000	5.9218	9.0000	9.0000	9.0000	1.0000
1A	4.0782	1.0000	0.8528	0.8528	0.1689	0.1689	0.2007	0.1689	1.0000	3.0782	3.0782	3.0782	0.1689
1-Off	1.0000	0.3249	0.2352	0.2352	0.1111	0.1111	0.1240	0.1111	0.3249	1.0000	1.0000	1.0000	0.1111
2-Off	1.0000	0.3249	0.2352	0.2352	0.1111	0.1111	0.1240	0.1111	0.3249	1.0000	1.0000	1.0000	0.1111
3-Off	1.0000	0.3249	0.2352	0.2352	0.1111	0.1111	0.1240	0.1111	0.3249	1.0000	1.0000	1.0000	0.1111
16	10.0000	5.9218	4.7492	4.7492	1.0000	1.0000	0.9381	1.0000	5.9218	9.0000	9.0000	9.0000	1.0000
Sum		33.9907	27.2193	27.2193	6.1582	6.1582	6.0506	6.1582	33.9907	61.7199	61.7199	61.7199	6.1582

Table 220. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category IV, 5.7 < n < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0294	0.0313	0.0313	0.0274	0.0274	0.0332	0.0274	0.0294	0.0499	0.0499	0.0499	0.0274	0.0345
2	0.0345	0.0367	0.0367	0.0342	0.0342	0.0434	0.0342	0.0345	0.0689	0.0689	0.0689	0.0342	0.0441
3	0.0345	0.0367	0.0367	0.0342	0.0342	0.0434	0.0342	0.0345	0.0689	0.0689	0.0689	0.0342	0.0441
4	0.1742	0.1745	0.1745	0.1624	0.1624	0.1550	0.1624	0.1742	0.1458	0.1458	0.1458	0.1624	0.1616
5	0.1742	0.1745	0.1745	0.1624	0.1624	0.1550	0.1624	0.1742	0.1458	0.1458	0.1458	0.1624	0.1616
6	0.1466	0.1400	0.1400	0.1731	0.1731	0.1653	0.1731	0.1466	0.1306	0.1306	0.1306	0.1731	0.1519
7	0.1742	0.1745	0.1745	0.1624	0.1624	0.1550	0.1624	0.1742	0.1458	0.1458	0.1458	0.1624	0.1616
1A	0.0294	0.0313	0.0313	0.0274	0.0274	0.0332	0.0274	0.0294	0.0499	0.0499	0.0499	0.0274	0.0345
1-Off	0.0096	0.0086	0.0086	0.0180	0.0180	0.0205	0.0180	0.0096	0.0162	0.0162	0.0162	0.0180	0.0148
2-Off	0.0096	0.0086	0.0086	0.0180	0.0180	0.0205	0.0180	0.0096	0.0162	0.0162	0.0162	0.0180	0.0148
3-Off	0.0096	0.0086	0.0086	0.0180	0.0180	0.0205	0.0180	0.0096	0.0162	0.0162	0.0162	0.0180	0.0148
16	0.1742	0.1745	0.1745	0.1624	0.1624	0.1550	0.1624	0.1742	0.1458	0.1458	0.1458	0.1624	0.1616

Table 221. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0345	0.0441	0.0441	0.1616	0.1616	0.1519	0.1616	0.0345	0.0148	0.0148	0.0148	0.1616	1.0000	
1	0.0345	0.0376	0.0376	0.0273	0.0273	0.0305	0.0273	0.0345	0.0456	0.0456	0.0456	0.0273	0.4206	12.1921
2	0.0405	0.0441	0.0441	0.0340	0.0340	0.0399	0.0340	0.0405	0.0629	0.0629	0.0629	0.0340	0.5339	12.1062
3	0.0405	0.0441	0.0441	0.0340	0.0340	0.0399	0.0340	0.0405	0.0629	0.0629	0.0629	0.0340	0.5339	12.1062
4	0.2043	0.2094	0.2094	0.1616	0.1616	0.1425	0.1616	0.2043	0.1333	0.1333	0.1333	0.1616	2.0162	12.4751
5	0.2043	0.2094	0.2094	0.1616	0.1616	0.1425	0.1616	0.2043	0.1333	0.1333	0.1333	0.1616	2.0162	12.4751
6	0.1719	0.1681	0.1681	0.1723	0.1723	0.1519	0.1723	0.1719	0.1194	0.1194	0.1194	0.1723	1.8792	12.3709
7	0.2043	0.2094	0.2094	0.1616	0.1616	0.1425	0.1616	0.2043	0.1333	0.1333	0.1333	0.1616	2.0162	12.4751
1A	0.0345	0.0376	0.0376	0.0273	0.0273	0.0305	0.0273	0.0345	0.0456	0.0456	0.0456	0.0273	0.4206	12.1921
1-Off	0.0112	0.0104	0.0104	0.0180	0.0180	0.0188	0.0180	0.0112	0.0148	0.0148	0.0148	0.0180	0.1783	12.0390
2-Off	0.0112	0.0104	0.0104	0.0180	0.0180	0.0188	0.0180	0.0112	0.0148	0.0148	0.0148	0.0180	0.1783	12.0390
3-Off	0.0112	0.0104	0.0104	0.0180	0.0180	0.0188	0.0180	0.0112	0.0148	0.0148	0.0148	0.0180	0.1783	12.0390
16	0.2043	0.2094	0.2094	0.1616	0.1616	0.1425	0.1616	0.2043	0.1333	0.1333	0.1333	0.1616	2.0162	12.4751

Size of *n*	12.0000
Sum	146.9851
Sum/*n* = λ_{max}	12.2488
CI	0.0226
RI	1.4497
CR	0.0156

Table 222. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	6.6038	4.5660	4.5660	10.0000	10.0000	10.0000	10.0000	6.6038	1.0000	1.0000	1.0000	10.0000
1	6.6038	1.0000	2.0378	2.0378	0.2944	0.2944	0.2944	0.2944	1.0000	5.6038	5.6038	5.6038	0.2944
2	4.5660	0.4907	1.0000	1.0000	0.1840	0.1840	0.1840	0.1840	0.4907	3.5660	3.5660	3.5660	0.1840
3	4.5660	0.4907	1.0000	1.0000	0.1840	0.1840	0.1840	0.1840	0.4907	3.5660	3.5660	3.5660	0.1840
4	10.0000	3.3962	5.4340	5.4340	1.0000	1.0000	1.0000	1.0000	3.3962	9.0000	9.0000	9.0000	1.0000
5	10.0000	3.3962	5.4340	5.4340	1.0000	1.0000	1.0000	1.0000	3.3962	9.0000	9.0000	9.0000	1.0000
6	10.0000	3.3962	5.4340	5.4340	1.0000	1.0000	1.0000	1.0000	3.3962	9.0000	9.0000	9.0000	1.0000
7	10.0000	3.3962	5.4340	5.4340	1.0000	1.0000	1.0000	1.0000	3.3962	9.0000	9.0000	9.0000	1.0000
1A	6.6038	1.0000	2.0378	2.0378	0.2944	0.2944	0.2944	0.2944	1.0000	5.6038	5.6038	5.6038	0.2944
1-Off	1.0000	0.1785	0.2804	0.2804	0.1111	0.1111	0.1111	0.1111	0.1785	1.0000	1.0000	1.0000	0.1111
2-Off	1.0000	0.1785	0.2804	0.2804	0.1111	0.1111	0.1111	0.1111	0.1785	1.0000	1.0000	1.0000	0.1111
3-Off	1.0000	0.1785	0.2804	0.2804	0.1111	0.1111	0.1111	0.1111	0.1785	1.0000	1.0000	1.0000	0.1111
16	10.0000	3.3962	5.4340	5.4340	1.0000	1.0000	1.0000	1.0000	3.3962	9.0000	9.0000	9.0000	1.0000
Sum		20.4978	34.0869	34.0869	6.2903	6.2903	6.2903	6.2903	20.4978	66.3396	66.3396	66.3396	6.2903

Table 223. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category V, $8.8 < n < 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0488	0.0598	0.0598	0.0468	0.0468	0.0468	0.0468	0.0488	0.0845	0.0845	0.0845	0.0468	0.0587
2	0.0239	0.0293	0.0293	0.0293	0.0293	0.0293	0.0293	0.0239	0.0538	0.0538	0.0538	0.0293	0.0345
3	0.0239	0.0293	0.0293	0.0293	0.0293	0.0293	0.0293	0.0239	0.0538	0.0538	0.0538	0.0293	0.0345
4	0.1657	0.1594	0.1594	0.1590	0.1590	0.1590	0.1590	0.1657	0.1357	0.1357	0.1357	0.1590	0.1543
5	0.1657	0.1594	0.1594	0.1590	0.1590	0.1590	0.1590	0.1657	0.1357	0.1357	0.1357	0.1590	0.1543
6	0.1657	0.1594	0.1594	0.1590	0.1590	0.1590	0.1590	0.1657	0.1357	0.1357	0.1357	0.1590	0.1543
7	0.1657	0.1594	0.1594	0.1590	0.1590	0.1590	0.1590	0.1657	0.1357	0.1357	0.1357	0.1590	0.1543
1A	0.0488	0.0598	0.0598	0.0468	0.0468	0.0468	0.0468	0.0488	0.0845	0.0845	0.0845	0.0468	0.0587
1-Off	0.0087	0.0082	0.0082	0.0177	0.0177	0.0177	0.0177	0.0087	0.0151	0.0151	0.0151	0.0177	0.0140
2-Off	0.0087	0.0082	0.0082	0.0177	0.0177	0.0177	0.0177	0.0087	0.0151	0.0151	0.0151	0.0177	0.0140
3-Off	0.0087	0.0082	0.0082	0.0177	0.0177	0.0177	0.0177	0.0087	0.0151	0.0151	0.0151	0.0177	0.0140
16	0.1657	0.1594	0.1594	0.1590	0.1590	0.1590	0.1590	0.1657	0.1357	0.1357	0.1357	0.1590	0.1543

Table 224. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category V, 8.8 < n < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0587	0.0345	0.0345	0.1543	0.1543	0.1543	0.1543	0.0587	0.0140	0.0140	0.0140	0.1543	1.0000	
1	0.0587	0.0703	0.0703	0.0454	0.0454	0.0454	0.0454	0.0587	0.0782	0.0782	0.0782	0.0454	0.7198	12.2593
2	0.0288	0.0345	0.0345	0.0284	0.0284	0.0284	0.0284	0.0288	0.0497	0.0497	0.0497	0.0284	0.4179	12.1103
3	0.0288	0.0345	0.0345	0.0284	0.0284	0.0284	0.0284	0.0288	0.0497	0.0497	0.0497	0.0284	0.4179	12.1103
4	0.1994	0.1875	0.1875	0.1543	0.1543	0.1543	0.1543	0.1994	0.1256	0.1256	0.1256	0.1543	1.9222	12.4545
5	0.1994	0.1875	0.1875	0.1543	0.1543	0.1543	0.1543	0.1994	0.1256	0.1256	0.1256	0.1543	1.9222	12.4545
6	0.1994	0.1875	0.1875	0.1543	0.1543	0.1543	0.1543	0.1994	0.1256	0.1256	0.1256	0.1543	1.9222	12.4545
7	0.1994	0.1875	0.1875	0.1543	0.1543	0.1543	0.1543	0.1994	0.1256	0.1256	0.1256	0.1543	1.9222	12.4545
1A	0.0587	0.0703	0.0703	0.0454	0.0454	0.0454	0.0454	0.0587	0.0782	0.0782	0.0782	0.0454	0.7198	12.2593
1-Off	0.0105	0.0097	0.0097	0.0171	0.0171	0.0171	0.0171	0.0105	0.0140	0.0140	0.0140	0.0171	0.1679	12.0358
2-Off	0.0105	0.0097	0.0097	0.0171	0.0171	0.0171	0.0171	0.0105	0.0140	0.0140	0.0140	0.0171	0.1679	12.0358
3-Off	0.0105	0.0097	0.0097	0.0171	0.0171	0.0171	0.0171	0.0105	0.0140	0.0140	0.0140	0.0171	0.1679	12.0358
16	0.1994	0.1875	0.1875	0.1543	0.1543	0.1543	0.1543	0.1994	0.1256	0.1256	0.1256	0.1543	1.9222	12.4545

Size of *n*	12.0000
Sum	147.1189
Sum/*n* = λ_{max}	12.2599
CI	0.0236
RI	1.4497
CR	0.0163

Table 225. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	10.0000	7.5250	7.5250	10.0000	10.0000	10.0000	10.0000	10.0000	1.0000	1.0000	1.0000	10.0000
1	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
2	7.5250	0.4040	1.0000	1.0000	0.4040	0.4040	0.4040	0.4040	0.4040	6.5250	6.5250	6.5250	0.4040
3	7.5250	0.4040	1.0000	1.0000	0.4040	0.4040	0.4040	0.4040	0.4040	6.5250	6.5250	6.5250	0.4040
4	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
5	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
6	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
7	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
1A	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
1-Off	1.0000	0.1111	0.1533	0.1533	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
2-Off	1.0000	0.1111	0.1533	0.1533	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
3-Off	1.0000	0.1111	0.1533	0.1533	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	1.0000	1.0000	0.1111
16	10.0000	1.0000	2.4750	2.4750	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	9.0000	9.0000	1.0000
Sum		8.1414	19.7848	19.7848	8.1414	8.1414	8.1414	8.1414	8.1414	79.0500	79.0500	79.0500	8.1414

Table 226. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
2	0.0496	0.0505	0.0505	0.0496	0.0496	0.0496	0.0496	0.0496	0.0825	0.0825	0.0825	0.0496	0.0580
3	0.0496	0.0505	0.0505	0.0496	0.0496	0.0496	0.0496	0.0496	0.0825	0.0825	0.0825	0.0496	0.0580
4	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
5	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
6	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
7	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
1A	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210
1-Off	0.0136	0.0077	0.0077	0.0136	0.0136	0.0136	0.0136	0.0136	0.0127	0.0127	0.0127	0.0136	0.0124
2-Off	0.0136	0.0077	0.0077	0.0136	0.0136	0.0136	0.0136	0.0136	0.0127	0.0127	0.0127	0.0136	0.0124
3-Off	0.0136	0.0077	0.0077	0.0136	0.0136	0.0136	0.0136	0.0136	0.0127	0.0127	0.0127	0.0136	0.0124
16	0.1228	0.1251	0.1251	0.1228	0.1228	0.1228	0.1228	0.1228	0.1139	0.1139	0.1139	0.1228	0.1210

Table 227. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 5-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS/PV**
PV	0.1210	0.0580	0.0580	0.1210	0.1210	0.1210	0.1210	0.1210	0.0124	0.0124	0.0124	0.1210	1.0000	
1	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
2	0.0489	0.0580	0.0580	0.0489	0.0489	0.0489	0.0489	0.0489	0.0810	0.0810	0.0810	0.0489	0.7012	12.0869
3	0.0489	0.0580	0.0580	0.0489	0.0489	0.0489	0.0489	0.0489	0.0810	0.0810	0.0810	0.0489	0.7012	12.0869
4	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
5	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
6	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
7	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
1A	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449
1-Off	0.0134	0.0089	0.0089	0.0134	0.0134	0.0134	0.0134	0.0134	0.0124	0.0124	0.0124	0.0134	0.1491	12.0105
2-Off	0.0134	0.0089	0.0089	0.0134	0.0134	0.0134	0.0134	0.0134	0.0124	0.0124	0.0124	0.0134	0.1491	12.0105
3-Off	0.0134	0.0089	0.0089	0.0134	0.0134	0.0134	0.0134	0.0134	0.0124	0.0124	0.0124	0.0134	0.1491	12.0105
16	0.1210	0.1436	0.1436	0.1210	0.1210	0.1210	0.1210	0.1210	0.1117	0.1117	0.1117	0.1210	1.4691	12.1449

Size of *n*	12.0000
Sum	145.2197
Sum/*n* = λ_{max}	12.1016
CI	0.0092
RI	1.4497
CR	0.0064

Table 228. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	5.3185	7.4961	8.1853	10.0000	10.0000	5.3185	7.4961	5.3185	1.0000	8.6828	8.5483	5.2533
1	5.3185	1.0000	0.4592	0.3488	0.2136	0.2136	1.0000	0.4592	1.0000	4.3185	0.2972	0.3096	1.0000
2	7.4961	2.1776	1.0000	1.4510	0.3994	0.3994	2.1776	1.0000	2.1776	6.4961	0.8427	0.9504	2.2428
3	8.1853	2.8668	0.6892	1.0000	0.5511	0.5511	2.8668	0.6892	2.8668	7.1853	2.0101	2.7548	2.9320
4	10.0000	4.6815	2.5039	1.8147	1.0000	1.0000	4.6815	2.5039	4.6815	9.0000	1.3172	1.4517	4.7467
5	10.0000	4.6815	2.5039	1.8147	1.0000	1.0000	4.6815	2.5039	4.6815	9.0000	1.3172	1.4517	4.7467
6	5.3185	1.0000	0.4592	0.3488	0.2136	0.2136	1.0000	0.4592	1.0000	4.3185	0.2972	0.3096	1.0000
7	7.4961	2.1776	1.0000	1.4510	0.3994	0.3994	2.1776	1.0000	2.1776	6.4961	0.8427	0.9504	2.2428
1A	5.3185	1.0000	0.4592	0.3488	0.2136	0.2136	1.0000	0.4592	1.0000	4.3185	0.2972	0.3096	1.0000
1-Off	1.0000	0.2316	0.1539	0.1392	0.1111	0.1111	0.2316	0.1539	0.2316	1.0000	0.1302	0.1325	0.2351
2-Off	8.6828	3.3643	1.1867	0.4975	0.7592	0.7592	3.3643	1.1867	3.3643	7.6828	1.0000	1.0000	3.4295
3-Off	8.5483	3.2298	1.0522	0.3630	0.6888	0.6888	3.2298	1.0522	3.2298	7.5483	1.0000	1.0000	3.2950
16	5.2533	1.0000	0.4459	0.3411	0.2107	0.2107	1.0000	0.4459	1.0000	4.2533	0.2916	0.3035	1.0000
Sum		27.4107	11.9134	9.9185	5.7604	5.7604	27.4107	11.9134	27.4107	71.6174	9.6433	10.9238	27.8706

Table 229. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category I, 0.5 < n < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0365	0.0385	0.0352	0.0371	0.0371	0.0365	0.0385	0.0365	0.0603	0.0308	0.0283	0.0359	0.0376
2	0.0794	0.0839	0.1463	0.0693	0.0693	0.0794	0.0839	0.0794	0.0907	0.0874	0.0870	0.0805	0.0864
3	0.1046	0.0579	0.1008	0.0957	0.0957	0.1046	0.0579	0.1046	0.1003	0.2084	0.2522	0.1052	0.1156
4	0.1708	0.2102	0.1830	0.1736	0.1736	0.1708	0.2102	0.1708	0.1257	0.1366	0.1329	0.1703	0.1690
5	0.1708	0.2102	0.1830	0.1736	0.1736	0.1708	0.2102	0.1708	0.1257	0.1366	0.1329	0.1703	0.1690
6	0.0365	0.0385	0.0352	0.0371	0.0371	0.0365	0.0385	0.0365	0.0603	0.0308	0.0283	0.0359	0.0376
7	0.0794	0.0839	0.1463	0.0693	0.0693	0.0794	0.0839	0.0794	0.0907	0.0874	0.0870	0.0805	0.0864
1A	0.0365	0.0385	0.0352	0.0371	0.0371	0.0365	0.0385	0.0365	0.0603	0.0308	0.0283	0.0359	0.0376
1-Off	0.0084	0.0129	0.0140	0.0193	0.0193	0.0084	0.0129	0.0084	0.0140	0.0135	0.0121	0.0084	0.0127
2-Off	0.1227	0.0996	0.0502	0.1318	0.1318	0.1227	0.0996	0.1227	0.1073	0.1037	0.0915	0.1231	0.1089
3-Off	0.1178	0.0883	0.0366	0.1196	0.1196	0.1178	0.0883	0.1178	0.1054	0.1037	0.0915	0.1182	0.1021
16	0.0365	0.0374	0.0344	0.0366	0.0366	0.0365	0.0374	0.0365	0.0594	0.0302	0.0278	0.0359	0.0371

Table 230. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category I, 0.5 < *n* < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0376	0.0864	0.1156	0.1690	0.1690	0.0376	0.0864	0.0376	0.0127	0.1089	0.1021	0.0371	1.0000	
1	0.0376	0.0397	0.0403	0.0361	0.0361	0.0376	0.0397	0.0376	0.0546	0.0324	0.0316	0.0371	0.4604	12.2442
2	0.0819	0.0864	0.1678	0.0675	0.0675	0.0819	0.0864	0.0819	0.0822	0.0918	0.0970	0.0832	1.0754	12.4475
3	0.1078	0.0595	0.1156	0.0931	0.0931	0.1078	0.0595	0.1078	0.0909	0.2189	0.2812	0.1088	1.4441	12.4873
4	0.1760	0.2163	0.2099	0.1690	0.1690	0.1760	0.2163	0.1760	0.1139	0.1434	0.1482	0.1761	2.0902	12.3659
5	0.1760	0.2163	0.2099	0.1690	0.1690	0.1760	0.2163	0.1760	0.1139	0.1434	0.1482	0.1761	2.0902	12.3659
6	0.0376	0.0397	0.0403	0.0361	0.0361	0.0376	0.0397	0.0376	0.0546	0.0324	0.0316	0.0371	0.4604	12.2442
7	0.0819	0.0864	0.1678	0.0675	0.0675	0.0819	0.0864	0.0819	0.0822	0.0918	0.0970	0.0832	1.0754	12.4475
1A	0.0376	0.0397	0.0403	0.0361	0.0361	0.0376	0.0397	0.0376	0.0546	0.0324	0.0316	0.0371	0.4604	12.2442
1-Off	0.0087	0.0133	0.0161	0.0188	0.0188	0.0087	0.0133	0.0087	0.0127	0.0142	0.0135	0.0087	0.1554	12.2865
2-Off	0.1265	0.1025	0.0575	0.1283	0.1283	0.1265	0.1025	0.1265	0.0972	0.1089	0.1021	0.1272	1.3341	12.2513
3-Off	0.1214	0.0909	0.0420	0.1164	0.1164	0.1214	0.0909	0.1214	0.0955	0.1089	0.1021	0.1222	1.2497	12.2441
16	0.0376	0.0385	0.0394	0.0356	0.0356	0.0376	0.0385	0.0376	0.0538	0.0318	0.0310	0.0371	0.4541	12.2432

Size of *n*	12.0000
Sum	147.8719
Sum/*n* = λ_{max}	12.3227
CI	0.0293
RI	1.4497
CR	0.0202

Table 231. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	7.9022	6.2317	6.8532	10.0000	10.0000	7.9022	6.2317	7.9022	1.0000	8.3295	6.3353	7.3842
1	7.9022	1.0000	1.6705	1.0490	0.4767	0.4767	1.0000	1.6705	1.0000	6.9022	2.3403	1.5669	0.5180
2	6.2317	0.5986	1.0000	1.6090	0.2654	0.2654	0.5986	1.0000	0.5986	5.2317	0.4767	1.0000	0.8677
3	6.8532	0.9533	0.6215	1.0000	0.3178	0.3178	0.9533	0.6215	0.9533	5.8532	0.6774	0.5179	1.8832
4	10.0000	2.0978	3.7683	3.1468	1.0000	1.0000	2.0978	3.7683	2.0978	9.0000	1.6705	3.6647	2.6158
5	10.0000	2.0978	3.7683	3.1468	1.0000	1.0000	2.0978	3.7683	2.0978	9.0000	1.6705	3.6647	2.6158
6	7.9022	1.0000	1.6705	1.0490	0.4767	0.4767	1.0000	1.6705	1.0000	6.9022	2.3403	1.5669	0.5180
7	6.2317	0.5986	1.0000	1.6090	0.2654	0.2654	0.5986	1.0000	0.5986	5.2317	0.4767	1.0000	0.8677
1A	7.9022	1.0000	1.6705	1.0490	0.4767	0.4767	1.0000	1.6705	1.0000	6.9022	2.3403	1.5669	0.5180
1-Off	1.0000	0.1449	0.1911	0.1708	0.1111	0.1111	0.1449	0.1911	0.1449	1.0000	0.1364	0.1874	0.1566
2-Off	8.3295	0.4273	2.0978	1.4763	0.5986	0.5986	0.4273	2.0978	0.4273	7.3295	1.0000	1.9942	0.9453
3-Off	6.3353	0.6382	1.0000	1.9309	0.2729	0.2729	0.6382	1.0000	0.6382	5.3353	0.5015	1.0000	0.9534
16	7.3842	1.9305	1.1525	0.5310	0.3823	0.3823	1.9305	1.1525	1.9305	6.3842	1.0579	1.0489	1.0000
Sum		12.4870	19.6110	17.7676	5.6435	5.6435	12.4870	19.6110	12.4870	75.0722	14.6883	18.7785	13.4595

Table 232. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0801	0.0852	0.0590	0.0845	0.0845	0.0801	0.0852	0.0801	0.0919	0.1593	0.0834	0.0385	0.0843
2	0.0479	0.0510	0.0906	0.0470	0.0470	0.0479	0.0510	0.0479	0.0697	0.0325	0.0533	0.0645	0.0542
3	0.0763	0.0317	0.0563	0.0563	0.0563	0.0763	0.0317	0.0763	0.0780	0.0461	0.0276	0.1399	0.0627
4	0.1680	0.1922	0.1771	0.1772	0.1772	0.1680	0.1922	0.1680	0.1199	0.1137	0.1952	0.1943	0.1702
5	0.1680	0.1922	0.1771	0.1772	0.1772	0.1680	0.1922	0.1680	0.1199	0.1137	0.1952	0.1943	0.1702
6	0.0801	0.0852	0.0590	0.0845	0.0845	0.0801	0.0852	0.0801	0.0919	0.1593	0.0834	0.0385	0.0843
7	0.0479	0.0510	0.0906	0.0470	0.0470	0.0479	0.0510	0.0479	0.0697	0.0325	0.0533	0.0645	0.0542
1A	0.0801	0.0852	0.0590	0.0845	0.0845	0.0801	0.0852	0.0801	0.0919	0.1593	0.0834	0.0385	0.0843
1-Off	0.0116	0.0097	0.0096	0.0197	0.0197	0.0116	0.0097	0.0116	0.0133	0.0093	0.0100	0.0116	0.0123
2-Off	0.0342	0.1070	0.0831	0.1061	0.1061	0.0342	0.1070	0.0342	0.0976	0.0681	0.1062	0.0702	0.0795
3-Off	0.0511	0.0510	0.1087	0.0484	0.0484	0.0511	0.0510	0.0511	0.0711	0.0341	0.0533	0.0708	0.0575
16	0.1546	0.0588	0.0299	0.0677	0.0677	0.1546	0.0588	0.1546	0.0850	0.0720	0.0559	0.0743	0.0862

Table 233. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0843	0.0542	0.0627	0.1702	0.1702	0.0843	0.0542	0.0843	0.0123	0.0795	0.0575	0.0862	1.0000	
1	0.0843	0.0905	0.0658	0.0812	0.0812	0.0843	0.0905	0.0843	0.0849	0.1860	0.0901	0.0446	1.0677	12.6636
2	0.0505	0.0542	0.1010	0.0452	0.0452	0.0505	0.0542	0.0505	0.0643	0.0379	0.0575	0.0748	0.6856	12.6515
3	0.0804	0.0337	0.0627	0.0541	0.0541	0.0804	0.0337	0.0804	0.0720	0.0538	0.0298	0.1623	0.7973	12.7073
4	0.1769	0.2042	0.1974	0.1702	0.1702	0.1769	0.2042	0.1769	0.1106	0.1328	0.2107	0.2254	2.1565	12.6671
5	0.1769	0.2042	0.1974	0.1702	0.1702	0.1769	0.2042	0.1769	0.1106	0.1328	0.2107	0.2254	2.1565	12.6671
6	0.0843	0.0905	0.0658	0.0812	0.0812	0.0843	0.0905	0.0843	0.0849	0.1860	0.0901	0.0446	1.0677	12.6636
7	0.0505	0.0542	0.1010	0.0452	0.0452	0.0505	0.0542	0.0505	0.0643	0.0379	0.0575	0.0748	0.6856	12.6515
1A	0.0843	0.0905	0.0658	0.0812	0.0812	0.0843	0.0905	0.0843	0.0849	0.1860	0.0901	0.0446	1.0677	12.6636
1-Off	0.0122	0.0104	0.0107	0.0189	0.0189	0.0122	0.0104	0.0122	0.0123	0.0108	0.0108	0.0135	0.1533	12.4722
2-Off	0.0360	0.1137	0.0926	0.1019	0.1019	0.0360	0.1137	0.0360	0.0901	0.0795	0.1147	0.0814	0.9976	12.5487
3-Off	0.0538	0.0542	0.1211	0.0465	0.0465	0.0538	0.0542	0.0538	0.0656	0.0399	0.0575	0.0821	0.7290	12.6779
16	0.1628	0.0625	0.0333	0.0651	0.0651	0.1628	0.0625	0.1628	0.0785	0.0841	0.0603	0.0862	1.0858	12.6016

Size of *n*	12.0000
Sum	151.6358
Sum/*n* = λ_{max}	12.6363
CI	0.0578
RI	1.4497
CR	0.0399

Table 234. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	8.8893	6.6471	5.4637	10.0000	10.0000	8.8893	6.6471	8.8893	1.0000	6.8962	6.4706	9.6678
1	8.8893	1.0000	2.2422	3.4256	0.9003	0.9003	1.0000	2.2422	1.0000	7.8893	1.9931	2.4187	1.2845
2	6.6471	0.4460	1.0000	1.1834	0.2982	0.2982	0.4460	1.0000	0.4460	5.6471	1.0000	1.0000	0.3310
3	5.4637	0.2919	0.8450	1.0000	0.2204	0.2204	0.2919	0.8450	0.2919	4.4637	0.6981	0.9931	0.2379
4	10.0000	1.1107	3.3529	4.5363	1.0000	1.0000	1.1107	3.3529	1.1107	9.0000	3.1038	3.5294	0.3322
5	10.0000	1.1107	3.3529	4.5363	1.0000	1.0000	1.1107	3.3529	1.1107	9.0000	3.1038	3.5294	0.3322
6	8.8893	1.0000	2.2422	3.4256	0.9003	0.9003	1.0000	2.2422	1.0000	7.8893	1.9931	2.4187	1.2845
7	6.6471	0.4460	1.0000	1.1834	0.2982	0.2982	0.4460	1.0000	0.4460	5.6471	1.0000	1.0000	0.3310
1A	8.8893	1.0000	2.2422	3.4256	0.9003	0.9003	1.0000	2.2422	1.0000	7.8893	1.9931	2.4187	1.2845
1-Off	1.0000	0.1268	0.1771	0.2240	0.1111	0.1111	0.1268	0.1771	0.1268	1.0000	0.1696	0.1828	0.1154
2-Off	6.8962	0.5017	1.0000	1.4325	0.3222	0.3222	0.5017	1.0000	0.5017	5.8962	1.0000	0.4256	0.3608
3-Off	6.4706	0.4134	1.0000	1.0069	0.2833	0.2833	0.4134	1.0000	0.4134	5.4706	2.3496	1.0000	0.3128
16	9.6678	0.7785	3.0207	4.2041	3.0102	3.0102	0.7785	3.0207	0.7785	8.6678	2.7716	3.1972	1.0000
Sum		8.2257	21.4752	29.5837	9.2448	9.2448	8.2257	21.4752	8.2257	78.4604	21.1758	22.1136	7.2069

Table 235. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category III, 3.6 < n < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1216	0.1044	0.1158	0.0974	0.0974	0.1216	0.1044	0.1216	0.1006	0.0941	0.1094	0.1782	0.1139
2	0.0542	0.0466	0.0400	0.0323	0.0323	0.0542	0.0466	0.0542	0.0720	0.0472	0.0452	0.0459	0.0476
3	0.0355	0.0393	0.0338	0.0238	0.0238	0.0355	0.0393	0.0355	0.0569	0.0330	0.0449	0.0330	0.0362
4	0.1350	0.1561	0.1533	0.1082	0.1082	0.1350	0.1561	0.1350	0.1147	0.1466	0.1596	0.0461	0.1295
5	0.1350	0.1561	0.1533	0.1082	0.1082	0.1350	0.1561	0.1350	0.1147	0.1466	0.1596	0.0461	0.1295
6	0.1216	0.1044	0.1158	0.0974	0.0974	0.1216	0.1044	0.1216	0.1006	0.0941	0.1094	0.1782	0.1139
7	0.0542	0.0466	0.0400	0.0323	0.0323	0.0542	0.0466	0.0542	0.0720	0.0472	0.0452	0.0459	0.0476
1A	0.1216	0.1044	0.1158	0.0974	0.0974	0.1216	0.1044	0.1216	0.1006	0.0941	0.1094	0.1782	0.1139
1-Off	0.0154	0.0082	0.0076	0.0120	0.0120	0.0154	0.0082	0.0154	0.0127	0.0080	0.0083	0.0160	0.0116
2-Off	0.0610	0.0466	0.0484	0.0349	0.0349	0.0610	0.0466	0.0610	0.0751	0.0472	0.0192	0.0501	0.0488
3-Off	0.0503	0.0466	0.0340	0.0306	0.0306	0.0503	0.0466	0.0503	0.0697	0.1110	0.0452	0.0434	0.0507
16	0.0946	0.1407	0.1421	0.3256	0.3256	0.0946	0.1407	0.0946	0.1105	0.1309	0.1446	0.1388	0.1569

Table 236. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category III, 3.6 < n < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1139	0.0476	0.0362	0.1295	0.1295	0.1139	0.0476	0.1139	0.0116	0.0488	0.0507	0.1569	1.0000	
1	0.1139	0.1066	0.1240	0.1166	0.1166	0.1139	0.1066	0.1139	0.0916	0.0973	0.1227	0.2016	1.4252	12.5169
2	0.0508	0.0476	0.0428	0.0386	0.0386	0.0508	0.0476	0.0508	0.0656	0.0488	0.0507	0.0520	0.5846	12.2935
3	0.0332	0.0402	0.0362	0.0285	0.0285	0.0332	0.0402	0.0332	0.0518	0.0341	0.0504	0.0373	0.4470	12.3474
4	0.1265	0.1594	0.1642	0.1295	0.1295	0.1265	0.1594	0.1265	0.1045	0.1515	0.1790	0.0521	1.6087	12.4226
5	0.1265	0.1594	0.1642	0.1295	0.1295	0.1265	0.1594	0.1265	0.1045	0.1515	0.1790	0.0521	1.6087	12.4226
6	0.1139	0.1066	0.1240	0.1166	0.1166	0.1139	0.1066	0.1139	0.0916	0.0973	0.1227	0.2016	1.4252	12.5169
7	0.0508	0.0476	0.0428	0.0386	0.0386	0.0508	0.0476	0.0508	0.0656	0.0488	0.0507	0.0520	0.5846	12.2935
1A	0.1139	0.1066	0.1240	0.1166	0.1166	0.1139	0.1066	0.1139	0.0916	0.0973	0.1227	0.2016	1.4252	12.5169
1-Off	0.0144	0.0084	0.0081	0.0144	0.0144	0.0144	0.0084	0.0144	0.0116	0.0083	0.0093	0.0181	0.1443	12.4254
2-Off	0.0571	0.0476	0.0519	0.0417	0.0417	0.0571	0.0476	0.0571	0.0685	0.0488	0.0216	0.0566	0.5973	12.2333
3-Off	0.0471	0.0476	0.0365	0.0367	0.0367	0.0471	0.0476	0.0471	0.0635	0.1147	0.0507	0.0491	0.6242	12.3092
16	0.0886	0.1437	0.1522	0.3898	0.3898	0.0886	0.1437	0.0886	0.1007	0.1353	0.1621	0.1569	2.0401	12.9996

Size of n	12.0000
Sum	149.2979
Sum/n = λ_{max}	12.4415
CI	0.0401
RI	1.4497
CR	0.0277

Table 237. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < n < 8.8 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	9.0000	8.2222	7.7778	10.0000	10.0000	9.0000	8.2222	9.0000	4.9444	1.0000	1.0000	10.0000
1	9.0000	1.0000	0.7778	1.2222	1.0000	1.0000	1.0000	0.7778	1.0000	4.0556	8.0000	8.0000	1.0000
2	8.2222	1.2857	1.0000	0.4444	0.5625	0.5625	1.2857	1.0000	1.2857	3.2778	7.2222	7.2222	0.5625
3	7.7778	0.8182	2.2502	1.0000	0.4500	0.4500	0.8182	2.2502	0.8182	2.8334	6.7778	6.7778	0.4500
4	10.0000	1.0000	1.7778	2.2222	1.0000	1.0000	1.0000	1.7778	1.0000	5.0556	9.0000	9.0000	1.0000
5	10.0000	1.0000	1.7778	2.2222	1.0000	1.0000	1.0000	1.7778	1.0000	5.0556	9.0000	9.0000	1.0000
6	9.0000	1.0000	0.7778	1.2222	1.0000	1.0000	1.0000	0.7778	1.0000	4.0556	8.0000	8.0000	1.0000
7	8.2222	1.2857	1.0000	0.4444	0.5625	0.5625	1.2857	1.0000	1.2857	3.2778	7.2222	7.2222	0.5625
1A	9.0000	1.0000	0.7778	1.2222	1.0000	1.0000	1.0000	0.7778	1.0000	4.0556	8.0000	8.0000	1.0000
1-Off	4.9444	0.2466	0.3051	0.3529	0.1978	0.1978	0.2466	0.3051	0.2466	1.0000	3.9444	3.9444	0.1978
2-Off	1.0000	0.1250	0.1385	0.1475	0.1111	0.1111	0.1250	0.1385	0.1250	0.2535	1.0000	1.0000	0.1111
3-Off	1.0000	0.1250	0.1385	0.1475	0.1111	0.1111	0.1250	0.1385	0.1250	0.2535	1.0000	1.0000	0.1111
16	10.0000	1.0000	1.7778	2.2222	1.0000	1.0000	1.0000	1.7778	1.0000	5.0556	9.0000	9.0000	1.0000
Sum		9.8861	12.4990	12.8700	7.9950	7.9950	9.8861	12.4990	9.8861	38.2296	78.1666	78.1666	7.9950

Table 238. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1012	0.0622	0.0950	0.1251	0.1251	0.1012	0.0622	0.1012	0.1061	0.1023	0.1023	0.1251	0.1007
2	0.1300	0.0800	0.0345	0.0704	0.0704	0.1300	0.0800	0.1300	0.0857	0.0924	0.0924	0.0704	0.0889
3	0.0828	0.1800	0.0777	0.0563	0.0563	0.0828	0.1800	0.0828	0.0741	0.0867	0.0867	0.0563	0.0919
4	0.1012	0.1422	0.1727	0.1251	0.1251	0.1012	0.1422	0.1012	0.1322	0.1151	0.1151	0.1251	0.1249
5	0.1012	0.1422	0.1727	0.1251	0.1251	0.1012	0.1422	0.1012	0.1322	0.1151	0.1151	0.1251	0.1249
6	0.1012	0.0622	0.0950	0.1251	0.1251	0.1012	0.0622	0.1012	0.1061	0.1023	0.1023	0.1251	0.1007
7	0.1300	0.0800	0.0345	0.0704	0.0704	0.1300	0.0800	0.1300	0.0857	0.0924	0.0924	0.0704	0.0889
1A	0.1012	0.0622	0.0950	0.1251	0.1251	0.1012	0.0622	0.1012	0.1061	0.1023	0.1023	0.1251	0.1007
1-Off	0.0249	0.0244	0.0274	0.0247	0.0247	0.0249	0.0244	0.0249	0.0262	0.0505	0.0505	0.0247	0.0294
2-Off	0.0126	0.0111	0.0115	0.0139	0.0139	0.0126	0.0111	0.0126	0.0066	0.0128	0.0128	0.0139	0.0121
3-Off	0.0126	0.0111	0.0115	0.0139	0.0139	0.0126	0.0111	0.0126	0.0066	0.0128	0.0128	0.0139	0.0121
16	0.1012	0.1422	0.1727	0.1251	0.1251	0.1012	0.1422	0.1012	0.1322	0.1151	0.1151	0.1251	0.1249

Table 239. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1007	0.0889	0.0919	0.1249	0.1249	0.1007	0.0889	0.1007	0.0294	0.0121	0.0121	0.1249	1.0000	
1	0.1007	0.0691	0.1123	0.1249	0.1249	0.1007	0.0691	0.1007	0.1191	0.0970	0.0970	0.1249	1.2404	12.3124
2	0.1295	0.0889	0.0408	0.0702	0.0702	0.1295	0.0889	0.1295	0.0962	0.0875	0.0875	0.0702	1.0891	12.2573
3	0.0824	0.1999	0.0919	0.0562	0.0562	0.0824	0.1999	0.0824	0.0832	0.0822	0.0822	0.0562	1.1551	12.5735
4	0.1007	0.1580	0.2042	0.1249	0.1249	0.1007	0.1580	0.1007	0.1485	0.1091	0.1091	0.1249	1.5635	12.5222
5	0.1007	0.1580	0.2042	0.1249	0.1249	0.1007	0.1580	0.1007	0.1485	0.1091	0.1091	0.1249	1.5635	12.5222
6	0.1007	0.0691	0.1123	0.1249	0.1249	0.1007	0.0691	0.1007	0.1191	0.0970	0.0970	0.1249	1.2404	12.3124
7	0.1295	0.0889	0.0408	0.0702	0.0702	0.1295	0.0889	0.1295	0.0962	0.0875	0.0875	0.0702	1.0891	12.2573
1A	0.1007	0.0691	0.1123	0.1249	0.1249	0.1007	0.0691	0.1007	0.1191	0.0970	0.0970	0.1249	1.2404	12.3124
1-Off	0.0248	0.0271	0.0324	0.0247	0.0247	0.0248	0.0271	0.0248	0.0294	0.0478	0.0478	0.0247	0.3602	12.2683
2-Off	0.0126	0.0123	0.0136	0.0139	0.0139	0.0126	0.0123	0.0126	0.0074	0.0121	0.0121	0.0139	0.1492	12.3123
3-Off	0.0126	0.0123	0.0136	0.0139	0.0139	0.0126	0.0123	0.0126	0.0074	0.0121	0.0121	0.0139	0.1492	12.3123
16	0.1007	0.1580	0.2042	0.1249	0.1249	0.1007	0.1580	0.1007	0.1485	0.1091	0.1091	0.1249	1.5635	12.5222

Size of *n*	12.0000
Sum	148.4846
Sum/*n* = λ_{max}	12.3737
CI	0.0340
RI	1.4497
CR	0.0234

Table 240. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	1.0000	2.8000	10.0000
1	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
2	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
3	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
4	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
5	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
6	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
7	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
1A	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
1-Off	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
2-Off	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	0.5556	0.1111
3-Off	2.8000	0.1389	0.1389	0.1389	0.1389	0.1389	0.1389	0.1389	0.1389	0.1389	1.8000	1.0000	0.1389
16	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.2000	1.0000
Sum		10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	10.2500	92.8000	73.5556	10.2500

Table 241. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category V, $8.8 < n < 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
2	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
3	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
4	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
5	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
6	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
7	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
1A	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
1-Off	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0076	0.0108	0.0106
3-Off	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0136	0.0194	0.0136	0.0136	0.0140
16	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0970	0.0979	0.0976	0.0975

Table 242. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category V, 8.8 < n < 11.1 m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS/PV**
PV	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0106	0.0140	0.0975	1.0000	
1	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
2	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
3	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
4	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
5	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
6	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
7	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
1A	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
1-Off	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0106	0.0078	0.0108	0.1267	12.0009
3-Off	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135	0.0135	0.0190	0.0140	0.0135	0.1685	12.0021
16	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0975	0.0950	0.1011	0.0975	1.1715	12.0109

Size of *n*	12.0000
Sum	144.1120
Sum/*n* = λ_{max}	12.0093
CI	0.0008
RI	1.4497
CR	0.0006

Table 243. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	1.0000	2.3846	10.0000
1	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
2	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
3	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
4	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
5	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
6	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
7	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
1A	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
1-Off	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
2-Off	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	1.0000	0.7222	0.1111
3-Off	2.3846	0.1313	0.1313	0.1313	0.1313	0.1313	0.1313	0.1313	0.1313	0.1313	1.3846	1.0000	0.1313
16	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	9.0000	7.6154	1.0000
Sum		10.2424	10.2424	10.2424	10.2424	10.2424	10.2424	10.2424	10.2424	10.2424	92.3846	77.8762	10.2424

Table 244. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**PV**
1	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
2	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
3	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
4	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
5	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
6	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
7	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
1A	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
1-Off	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0093	0.0108	0.0107
3-Off	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0150	0.0128	0.0128	0.0130
16	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0974	0.0978	0.0976	0.0976

Table 245. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 6-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0107	0.0130	0.0976	1.0000	
1	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
2	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
3	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
4	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
5	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
6	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
7	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
1A	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
1-Off	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020
2-Off	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0108	0.0107	0.0094	0.0108	0.1286	12.0002
3-Off	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0128	0.0148	0.0130	0.0128	0.1560	12.0003
16	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0976	0.0964	0.0990	0.0976	1.1717	12.0020

Size of n	12.0000
Sum	144.0209
Sum/n = λ_{max}	12.0017
CI	0.0002
RI	1.4497
CR	0.0001

Table 246. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	7.3711	7.3711	3.6211	1.0000	3.6211	10.0000	3.6211	7.3711	8.3376	8.3376	6.6753	10.0000
1	7.3711	1.0000	1.0000	3.7500	6.3711	3.7500	0.3804	3.7500	1.0000	1.0347	1.0347	0.6958	0.3804
2	7.3711	1.0000	1.0000	3.7500	6.3711	3.7500	0.3804	3.7500	1.0000	1.0347	1.0347	0.6958	0.3804
3	3.6211	0.2667	0.2667	1.0000	2.6211	1.0000	0.1568	1.0000	0.2667	0.2120	0.2120	0.3274	0.1568
4	1.0000	0.1570	0.1570	0.3815	1.0000	0.3815	0.1111	0.3815	0.1570	0.1363	0.1363	0.1762	0.1111
5	3.6211	0.2667	0.2667	1.0000	2.6211	1.0000	0.1568	1.0000	0.2667	0.2120	0.2120	0.3274	0.1568
6	10.0000	2.6289	2.6289	6.3789	9.0000	6.3789	1.0000	6.3789	2.6289	1.6624	1.6624	3.3247	1.0000
7	3.6211	0.2667	0.2667	1.0000	2.6211	1.0000	0.1568	1.0000	0.2667	0.2120	0.2120	0.3274	0.1568
1A	7.3711	1.0000	1.0000	3.7500	6.3711	3.7500	0.3804	3.7500	1.0000	1.0347	1.0347	0.6958	0.3804
1-Off	8.3376	0.9665	0.9665	4.7165	7.3376	4.7165	0.6015	4.7165	0.9665	1.0000	1.0000	1.6623	0.6015
2-Off	8.3376	0.9665	0.9665	4.7165	7.3376	4.7165	0.6015	4.7165	0.9665	1.0000	1.0000	1.6623	0.6015
3-Off	6.6753	1.4372	1.4372	3.0542	5.6753	3.0542	0.3008	3.0542	1.4372	0.6016	0.6016	1.0000	0.3008
16	10.0000	2.6289	2.6289	6.3789	9.0000	6.3789	1.0000	6.3789	2.6289	1.6624	1.6624	3.3247	1.0000
Sum		12.5850	12.5850	39.8765	66.3271	39.8765	5.2264	39.8765	12.5850	9.8027	9.8027	14.2199	5.2264

Table 247. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category I, 0.5 < n < 2.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.0795	0.0795	0.0940	0.0961	0.0940	0.0728	0.0940	0.0795	0.1055	0.1055	0.0489	0.0728	0.0852
2	0.0795	0.0795	0.0940	0.0961	0.0940	0.0728	0.0940	0.0795	0.1055	0.1055	0.0489	0.0728	0.0852
3	0.0212	0.0212	0.0251	0.0395	0.0251	0.0300	0.0251	0.0212	0.0216	0.0216	0.0230	0.0300	0.0254
4	0.0125	0.0125	0.0096	0.0151	0.0096	0.0213	0.0096	0.0125	0.0139	0.0139	0.0124	0.0213	0.0137
5	0.0212	0.0212	0.0251	0.0395	0.0251	0.0300	0.0251	0.0212	0.0216	0.0216	0.0230	0.0300	0.0254
6	0.2089	0.2089	0.1600	0.1357	0.1600	0.1913	0.1600	0.2089	0.1696	0.1696	0.2338	0.1913	0.1832
7	0.0212	0.0212	0.0251	0.0395	0.0251	0.0300	0.0251	0.0212	0.0216	0.0216	0.0230	0.0300	0.0254
1A	0.0795	0.0795	0.0940	0.0961	0.0940	0.0728	0.0940	0.0795	0.1055	0.1055	0.0489	0.0728	0.0852
1-Off	0.0768	0.0768	0.1183	0.1106	0.1183	0.1151	0.1183	0.0768	0.1020	0.1020	0.1169	0.1151	0.1039
2-Off	0.0768	0.0768	0.1183	0.1106	0.1183	0.1151	0.1183	0.0768	0.1020	0.1020	0.1169	0.1151	0.1039
3-Off	0.1142	0.1142	0.0766	0.0856	0.0766	0.0575	0.0766	0.1142	0.0614	0.0614	0.0703	0.0575	0.0805
16	0.2089	0.2089	0.1600	0.1357	0.1600	0.1913	0.1600	0.2089	0.1696	0.1696	0.2338	0.1913	0.1832

Table 248. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category I, $0.5 < n < 2.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.0852	0.0852	0.0254	0.0137	0.0254	0.1832	0.0254	0.0852	0.1039	0.1039	0.0805	0.1832	1.0000	
1	0.0852	0.0852	0.0952	0.0870	0.0952	0.0697	0.0952	0.0852	0.1075	0.1075	0.0560	0.0697	1.0385	12.1921
2	0.0852	0.0852	0.0952	0.0870	0.0952	0.0697	0.0952	0.0852	0.1075	0.1075	0.0560	0.0697	1.0385	12.1921
3	0.0227	0.0227	0.0254	0.0358	0.0254	0.0287	0.0254	0.0227	0.0220	0.0220	0.0264	0.0287	0.3079	12.1321
4	0.0134	0.0134	0.0097	0.0137	0.0097	0.0204	0.0097	0.0134	0.0142	0.0142	0.0142	0.0204	0.1660	12.1553
5	0.0227	0.0227	0.0254	0.0358	0.0254	0.0287	0.0254	0.0227	0.0220	0.0220	0.0264	0.0287	0.3079	12.1321
6	0.2239	0.2239	0.1619	0.1229	0.1619	0.1832	0.1619	0.2239	0.1727	0.1727	0.2677	0.1832	2.2599	12.3386
7	0.0227	0.0227	0.0254	0.0358	0.0254	0.0287	0.0254	0.0227	0.0220	0.0220	0.0264	0.0287	0.3079	12.1321
1A	0.0852	0.0852	0.0952	0.0870	0.0952	0.0697	0.0952	0.0852	0.1075	0.1075	0.0560	0.0697	1.0385	12.1921
1-Off	0.0823	0.0823	0.1197	0.1002	0.1197	0.1102	0.1197	0.0823	0.1039	0.1039	0.1338	0.1102	1.2684	12.2059
2-Off	0.0823	0.0823	0.1197	0.1002	0.1197	0.1102	0.1197	0.0823	0.1039	0.1039	0.1338	0.1102	1.2684	12.2059
3-Off	0.1224	0.1224	0.0775	0.0775	0.0775	0.0551	0.0775	0.1224	0.0625	0.0625	0.0805	0.0551	0.9931	12.3349
16	0.2239	0.2239	0.1619	0.1229	0.1619	0.1832	0.1619	0.2239	0.1727	0.1727	0.2677	0.1832	2.2599	12.3386

Size of *n*	12.0000
Sum	146.5516
Sum/*n* = λ_{max}	12.2126
CI	0.0193
RI	1.4497
CR	0.0133

Table 249. Iterative Approach: Pairwise Comparison of MAUT MU Values Associate with Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	9.6629	9.6629	7.8258	6.5955	7.8258	10.0000	7.8258	9.6629	5.7697	5.2303	1.0000	10.0000
1	9.6629	1.0000	1.0000	1.8371	3.0674	1.8371	2.9665	1.8371	1.0000	3.8932	4.4326	8.6629	2.9665
2	9.6629	1.0000	1.0000	1.8371	3.0674	1.8371	2.9665	1.8371	1.0000	3.8932	4.4326	8.6629	2.9665
3	7.8258	0.5443	0.5443	1.0000	1.2303	1.0000	0.4599	1.0000	0.5443	2.0561	2.5955	6.8258	0.4599
4	6.5955	0.3260	0.3260	0.8128	1.0000	0.8128	0.2937	0.8128	0.3260	0.8258	1.3652	5.5955	0.2937
5	7.8258	0.5443	0.5443	1.0000	1.2303	1.0000	0.4599	1.0000	0.5443	2.0561	2.5955	6.8258	0.4599
6	10.0000	0.3371	0.3371	2.1742	3.4045	2.1742	1.0000	2.1742	0.3371	4.2303	4.7697	9.0000	1.0000
7	7.8258	0.5443	0.5443	1.0000	1.2303	1.0000	0.4599	1.0000	0.5443	2.0561	2.5955	6.8258	0.4599
1A	9.6629	1.0000	1.0000	1.8371	3.0674	1.8371	2.9665	1.8371	1.0000	3.8932	4.4326	8.6629	2.9665
1-Off	5.7697	0.2569	0.2569	0.4864	1.2109	0.4864	0.2364	0.4864	0.2569	1.0000	0.5394	4.7697	0.2364
2-Off	5.2303	0.2256	0.2256	0.3853	0.7325	0.3853	0.2097	0.3853	0.2256	1.8539	1.0000	4.2303	0.2097
3-Off	1.0000	0.1154	0.1154	0.1465	0.1787	0.1465	0.1111	0.1465	0.1154	0.2097	0.2364	1.0000	0.1111
16	10.0000	0.3371	0.3371	2.1742	3.4045	2.1742	1.0000	2.1742	0.3371	4.2303	4.7697	9.0000	1.0000
Sum		6.2311	6.2311	14.6907	22.8243	14.6907	13.1301	14.6907	6.2311	30.1979	33.7647	80.0616	13.1301

Table 250. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < *n* < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1605	0.1605	0.1251	0.1344	0.1251	0.2259	0.1251	0.1605	0.1289	0.1313	0.1082	0.2259	0.1509
2	0.1605	0.1605	0.1251	0.1344	0.1251	0.2259	0.1251	0.1605	0.1289	0.1313	0.1082	0.2259	0.1509
3	0.0874	0.0874	0.0681	0.0539	0.0681	0.0350	0.0681	0.0874	0.0681	0.0769	0.0853	0.0350	0.0684
4	0.0523	0.0523	0.0553	0.0438	0.0553	0.0224	0.0553	0.0523	0.0273	0.0404	0.0699	0.0224	0.0458
5	0.0874	0.0874	0.0681	0.0539	0.0681	0.0350	0.0681	0.0874	0.0681	0.0769	0.0853	0.0350	0.0684
6	0.0541	0.0541	0.1480	0.1492	0.1480	0.0762	0.1480	0.0541	0.1401	0.1413	0.1124	0.0762	0.1085
7	0.0874	0.0874	0.0681	0.0539	0.0681	0.0350	0.0681	0.0874	0.0681	0.0769	0.0853	0.0350	0.0684
1A	0.1605	0.1605	0.1251	0.1344	0.1251	0.2259	0.1251	0.1605	0.1289	0.1313	0.1082	0.2259	0.1509
1-Off	0.0412	0.0412	0.0331	0.0531	0.0331	0.0180	0.0331	0.0412	0.0331	0.0160	0.0596	0.0180	0.0351
2-Off	0.0362	0.0362	0.0262	0.0321	0.0262	0.0160	0.0262	0.0362	0.0614	0.0296	0.0528	0.0160	0.0329
3-Off	0.0185	0.0185	0.0100	0.0078	0.0100	0.0085	0.0100	0.0185	0.0069	0.0070	0.0125	0.0085	0.0114
16	0.0541	0.0541	0.1480	0.1492	0.1480	0.0762	0.1480	0.0541	0.1401	0.1413	0.1124	0.0762	0.1085

Table 251. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category II, 2.1 < n < 3.6 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1509	0.1509	0.0684	0.0458	0.0684	0.1085	0.0684	0.1509	0.0351	0.0329	0.0114	0.1085	1.0000	
1	0.1509	0.1509	0.1256	0.1404	0.1256	0.3217	0.1256	0.1509	0.1365	0.1460	0.0987	0.3217	1.9946	13.2149
2	0.1509	0.1509	0.1256	0.1404	0.1256	0.3217	0.1256	0.1509	0.1365	0.1460	0.0987	0.3217	1.9946	13.2149
3	0.0822	0.0822	0.0684	0.0563	0.0684	0.0499	0.0684	0.0822	0.0721	0.0855	0.0777	0.0499	0.8430	12.3294
4	0.0492	0.0492	0.0556	0.0458	0.0556	0.0319	0.0556	0.0492	0.0290	0.0450	0.0637	0.0319	0.5615	12.2688
5	0.0822	0.0822	0.0684	0.0563	0.0684	0.0499	0.0684	0.0822	0.0721	0.0855	0.0777	0.0499	0.8430	12.3294
6	0.0509	0.0509	0.1487	0.1558	0.1487	0.1085	0.1487	0.0509	0.1483	0.1571	0.1025	0.1085	1.3792	12.7163
7	0.0822	0.0822	0.0684	0.0563	0.0684	0.0499	0.0684	0.0822	0.0721	0.0855	0.0777	0.0499	0.8430	12.3294
1A	0.1509	0.1509	0.1256	0.1404	0.1256	0.3217	0.1256	0.1509	0.1365	0.1460	0.0987	0.3217	1.9946	13.2149
1-Off	0.0388	0.0388	0.0333	0.0554	0.0333	0.0256	0.0333	0.0388	0.0351	0.0178	0.0543	0.0256	0.4299	12.2625
2-Off	0.0341	0.0341	0.0263	0.0335	0.0263	0.0227	0.0263	0.0341	0.0650	0.0329	0.0482	0.0227	0.4063	12.3379
3-Off	0.0174	0.0174	0.0100	0.0082	0.0100	0.0121	0.0100	0.0174	0.0074	0.0078	0.0114	0.0121	0.1411	12.3902
16	0.0509	0.0509	0.1487	0.1558	0.1487	0.1085	0.1487	0.0509	0.1483	0.1571	0.1025	0.1085	1.3792	12.7163

Size of *n*	12.0000
Sum	151.3246
Sum/*n* = λ_{max}	12.6104
CI	0.0555
RI	1.4497
CR	0.0383

Table 252. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	9.7775	9.7775	9.7330	9.6440	9.7330	10.0000	9.7330	9.7775	4.6044	6.4067	1.0000	10.0000
1	9.7775	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1731	3.3708	8.7775	1.0000
2	9.7775	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1731	3.3708	8.7775	1.0000
3	9.7330	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1286	3.3263	8.7330	1.0000
4	9.6440	1.0000	1.0000	1.0000	1.0000	1.0000	2.8090	1.0000	1.0000	5.0396	3.2373	8.6440	2.8090
5	9.7330	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1286	3.3263	8.7330	1.0000
6	10.0000	1.0000	1.0000	1.0000	0.3560	1.0000	1.0000	1.0000	1.0000	5.3956	3.5933	9.0000	1.0000
7	9.7330	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1286	3.3263	8.7330	1.0000
1A	9.7775	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	5.1731	3.3708	8.7775	1.0000
1-Off	4.6044	0.1933	0.1933	0.1950	0.1984	0.1950	0.1853	0.1950	0.1933	1.0000	0.5548	3.6044	0.1853
2-Off	6.4067	0.2967	0.2967	0.3006	0.3089	0.3006	0.2783	0.3006	0.2967	1.8023	1.0000	5.4067	0.2783
3-Off	1.0000	0.1139	0.1139	0.1145	0.1157	0.1145	0.1111	0.1145	0.1139	0.2774	0.1850	1.0000	0.1111
16	10.0000	1.0000	1.0000	1.0000	0.3560	1.0000	1.0000	1.0000	1.0000	5.3956	3.5933	9.0000	1.0000
Sum		9.6039	9.6039	9.6101	8.3350	9.6101	11.3837	9.6101	9.6039	49.8156	32.2550	89.1866	11.3837

Table 253. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category III, 3.6 < *n* < 5.7 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1038	0.1045	0.0984	0.0878	0.1022
2	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1038	0.1045	0.0984	0.0878	0.1022
3	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1030	0.1031	0.0979	0.0878	0.1020
4	0.1041	0.1041	0.1041	0.1200	0.1041	0.2468	0.1041	0.1041	0.1012	0.1004	0.0969	0.2468	0.1280
5	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1030	0.1031	0.0979	0.0878	0.1020
6	0.1041	0.1041	0.1041	0.0427	0.1041	0.0878	0.1041	0.1041	0.1083	0.1114	0.1009	0.0878	0.0970
7	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1030	0.1031	0.0979	0.0878	0.1020
1A	0.1041	0.1041	0.1041	0.1200	0.1041	0.0878	0.1041	0.1041	0.1038	0.1045	0.0984	0.0878	0.1022
1-Off	0.0201	0.0201	0.0203	0.0238	0.0203	0.0163	0.0203	0.0201	0.0201	0.0172	0.0404	0.0163	0.0213
2-Off	0.0309	0.0309	0.0313	0.0371	0.0313	0.0244	0.0313	0.0309	0.0362	0.0310	0.0606	0.0244	0.0334
3-Off	0.0119	0.0119	0.0119	0.0139	0.0119	0.0098	0.0119	0.0119	0.0056	0.0057	0.0112	0.0098	0.0106
16	0.1041	0.1041	0.1041	0.0427	0.1041	0.0878	0.1041	0.1041	0.1083	0.1114	0.1009	0.0878	0.0970

Table 254. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category III, $3.6 < n < 5.7$ m/s.

Loc. ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**	**WS**	**WS/PV**
PV	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.0213	0.0334	0.0106	0.0970	1.0000	
1	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1101	0.1124	0.0931	0.0970	1.2503	12.2285
2	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1101	0.1124	0.0931	0.0970	1.2503	12.2285
3	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1091	0.1110	0.0926	0.0970	1.2474	12.2278
4	0.1022	0.1022	0.1020	0.1280	0.1020	0.2724	0.1020	0.1022	0.1072	0.1080	0.0917	0.2724	1.5924	12.4371
5	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1091	0.1110	0.0926	0.0970	1.2474	12.2278
6	0.1022	0.1022	0.1020	0.0456	0.1020	0.0970	0.1020	0.1022	0.1148	0.1199	0.0954	0.0970	1.1824	12.1942
7	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1091	0.1110	0.0926	0.0970	1.2474	12.2278
1A	0.1022	0.1022	0.1020	0.1280	0.1020	0.0970	0.1020	0.1022	0.1101	0.1124	0.0931	0.0970	1.2503	12.2285
1-Off	0.0198	0.0198	0.0199	0.0254	0.0199	0.0180	0.0199	0.0198	0.0213	0.0185	0.0382	0.0180	0.2583	12.1417
2-Off	0.0303	0.0303	0.0307	0.0396	0.0307	0.0270	0.0307	0.0303	0.0383	0.0334	0.0573	0.0270	0.4056	12.1585
3-Off	0.0116	0.0116	0.0117	0.0148	0.0117	0.0108	0.0117	0.0116	0.0059	0.0062	0.0106	0.0108	0.1290	12.1677
16	0.1022	0.1022	0.1020	0.0456	0.1020	0.0970	0.1020	0.1022	0.1148	0.1199	0.0954	0.0970	1.1824	12.1942

Size of n	12.0000
Sum	146.6623
Sum/n = λ_{max}	12.2219
CI	0.0202
RI	1.4497
CR	0.0139

Table 255. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	3.6211	7.3789	1.0000	10.0000
1	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
2	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
3	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
4	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
5	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
6	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
7	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
1A	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
1-Off	3.6211	0.1568	0.1568	0.1568	0.1568	0.1568	0.1568	0.1568	0.1568	1.0000	0.2661	2.6211	0.1568
2-Off	7.3789	0.3815	0.3815	0.3815	0.3815	0.3815	0.3815	0.3815	0.3815	3.7578	1.0000	6.3789	0.3815
3-Off	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.3815	0.1568	1.0000	0.1111
16	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.3789	2.6211	9.0000	1.0000
Sum		9.6494	9.6494	9.6494	9.6494	9.6494	9.6494	9.6494	9.6494	62.5494	25.0128	91.0000	9.6494

Table 256. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category IV, 5.7 < *n* < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
2	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
3	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
4	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
5	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
6	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
7	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
1A	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032
1-Off	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0160	0.0106	0.0288	0.0162	0.0168
2-Off	0.0395	0.0395	0.0395	0.0395	0.0395	0.0395	0.0395	0.0395	0.0601	0.0400	0.0701	0.0395	0.0438
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0061	0.0063	0.0110	0.0115	0.0106
16	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1020	0.1048	0.0989	0.1036	0.1032

Table 257. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category IV, 5.7 < n < 8.8 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.0168	0.0438	0.0106	0.1032	1.0000	
1	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
2	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
3	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
4	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
5	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
6	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
7	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
1A	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749
1-Off	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0168	0.0117	0.0277	0.0162	0.2018	12.0096
2-Off	0.0394	0.0394	0.0394	0.0394	0.0394	0.0394	0.0394	0.0394	0.0631	0.0438	0.0675	0.0394	0.5288	12.0646
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0064	0.0069	0.0106	0.0115	0.1271	12.0069
16	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1072	0.1149	0.0952	0.1032	1.2461	12.0749

Size of n	12.0000
Sum	144.7553
Sum/n = λ_{max}	12.0629
CI	0.0057
RI	1.4497
CR	0.0039

Table 258. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID		1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16
	Normalized MU Value	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	3.6000	7.4000	1.0000	10.0000
1	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
2	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
3	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
4	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
5	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
6	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
7	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
1A	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
1-Off	3.6000	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	0.1563	1.0000	0.2632	2.6000	0.1563
2-Off	7.4000	0.3846	0.3846	0.3846	0.3846	0.3846	0.3846	0.3846	0.3846	3.8000	1.0000	6.4000	0.3846
3-Off	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.3846	0.1563	1.0000	0.1111
16	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	6.4000	2.6000	9.0000	1.0000
Sum		9.6520	9.6520	9.6520	9.6520	9.6520	9.6520	9.6520	9.6520	62.7846	24.8194	91.0000	9.6520

Table 259. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
2	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
3	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
4	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
5	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
6	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
7	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
1A	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032
1-Off	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0162	0.0159	0.0106	0.0286	0.0162	0.0167
2-Off	0.0398	0.0398	0.0398	0.0398	0.0398	0.0398	0.0398	0.0398	0.0605	0.0403	0.0703	0.0398	0.0441
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0061	0.0063	0.0110	0.0115	0.0106
16	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1036	0.1019	0.1048	0.0989	0.1036	0.1032

Table 260. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category V, 8.8 < *n* < 11.1 m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.0167	0.0441	0.0106	0.1032	1.0000	
1	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
2	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
3	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
4	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
5	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
6	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
7	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
1A	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739
1-Off	0.0161	0.0161	0.0161	0.0161	0.0161	0.0161	0.0161	0.0161	0.0167	0.0116	0.0275	0.0161	0.2010	12.0094
2-Off	0.0397	0.0397	0.0397	0.0397	0.0397	0.0397	0.0397	0.0397	0.0636	0.0441	0.0677	0.0397	0.5326	12.0640
3-Off	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0115	0.0064	0.0069	0.0106	0.0115	0.1271	12.0069
16	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1032	0.1071	0.1148	0.0953	0.1032	1.2457	12.0739

Size of *n*	12.0000
Sum	144.7457
Sum/*n* = λ_{max}	12.0621
CI	0.0056
RI	1.4497
CR	0.0039

Table 261. Iterative Approach: Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1A**	**1-Off**	**2-Off**	**3-Off**	**16**
	Normalized MU Value	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	5.5000	5.5000	1.0000	10.0000
1	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
2	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
3	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
4	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
5	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
6	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
7	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
1A	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
1-Off	3.6000	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	1.0000	1.0000	4.5000	0.2222
2-Off	7.4000	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	0.2222	1.0000	1.0000	4.5000	0.2222
3-Off	1.0000	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.1111	0.2222	0.2222	1.0000	0.1111
16	10.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	4.5000	4.5000	9.0000	1.0000
Sum		9.5556	9.5556	9.5556	9.5556	9.5556	9.5556	9.5556	9.5556	42.7222	42.7222	91.0000	9.5556

Table 262. Iterative Approach: Derivation of PVs from MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	PV
1	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
2	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
3	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
4	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
5	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
6	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
7	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
1A	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043
1-Off	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0234	0.0234	0.0495	0.0233	0.0255
2-Off	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0233	0.0234	0.0234	0.0495	0.0233	0.0255
3-Off	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0052	0.0052	0.0110	0.0116	0.0105
16	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1047	0.1053	0.1053	0.0989	0.1047	0.1043

Table 263. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT MU Values Associated with Windward Exposure Hours from 4-Off at Wind Speed Category VI, $n > 11.1$ m/s.

Loc. ID	1	2	3	4	5	6	7	1A	1-Off	2-Off	3-Off	16	WS	WS/PV
PV	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.0255	0.0255	0.0105	0.1043	1.0000	
1	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
2	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
3	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
4	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
5	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
6	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
7	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
1A	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041
1-Off	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0255	0.0255	0.0473	0.0232	0.3068	12.0470
2-Off	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0255	0.0255	0.0473	0.0232	0.3068	12.0470
3-Off	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0116	0.0057	0.0057	0.0105	0.0116	0.1261	12.0060
16	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1043	0.1146	0.1146	0.0945	0.1043	1.2623	12.1041

Size of n	12.0000
Sum	145.0366
Sum/n = λ_{max}	12.0864
CI	0.0079
RI	1.4497
CR	0.0054

Table 264. Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		Measured $C_{Rn\text{-}222}$	Distance from LTP	Distance from 5-Off	Distance from 6-Off
	Normalized Values	1.0000	10.0000	2.0000	2.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	0.1111	1.0000	1.0000
Distance, LTP	10.0000	9.0000	1.0000	8.0000	8.0000
Distance, 5-Off	2.0000	1.0000	0.1250	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	0.1250	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	0.1111	1.0000	1.0000
Elevation	10.0000	9.0000	1.0000	8.0000	8.0000
W.E., LTP, *n*-Cat I	7.0000	6.0000	0.3333	5.0000	5.0000
W.E., LTP, *n*-Cat II	4.0000	3.0000	0.1667	2.0000	2.0000
W.E., LTP, *n*-Cat III	3.0000	2.0000	0.1429	1.0000	1.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	0.1250	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	7.0000	0.5000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	4.0000	3.0000	0.1667	2.0000	2.0000
W.E., 5-Off, *n*-Cat III	3.0000	2.0000	0.1429	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	0.1250	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	7.0000	0.5000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	4.0000	3.0000	0.1667	2.0000	2.0000
W.E., 6-Off, *n*-Cat III	3.0000	2.0000	0.1429	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	0.1250	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	8.0000	1.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	4.0000	3.0000	0.1667	2.0000	2.0000
W.E., 4-Off, *n*-Cat III	3.0000	2.0000	0.1429	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	0.1250	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
Sum		82.0000	7.4325	68.0000	68.0000

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		Distance from 4-Off	Elevation	W.E., LTP, *n*-Cat I	W.E., LTP, *n*-Cat II
	Normalized Values	1.0000	10.0000	7.0000	4.0000
C_{Rn-222}	1.0000	1.0000	0.1111	0.1667	0.3333
Distance, LTP	10.0000	9.0000	1.0000	3.0000	6.0000
Distance, 5-Off	2.0000	1.0000	0.1250	0.2000	0.5000
Distance, 6-Off	2.0000	1.0000	0.1250	0.2000	0.5000
Distance, 4-Off	1.0000	1.0000	0.1111	0.1667	0.3333
Elevation	10.0000	9.0000	1.0000	3.0000	6.0000
W.E., LTP, *n*-Cat I	7.0000	6.0000	0.3333	1.0000	3.0000
W.E., LTP, *n*-Cat II	4.0000	3.0000	0.1667	0.3333	1.0000
W.E., LTP, *n*-Cat III	3.0000	2.0000	0.1429	0.2500	1.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	0.1250	0.2000	0.5000
W.E., LTP, *n*-Cat V	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., LTP, *n*-Cat VI	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 5-Off, *n*-Cat I	8.0000	7.0000	0.5000	1.0000	4.0000
W.E., 5-Off, *n*-Cat II	4.0000	3.0000	0.1667	0.3333	1.0000
W.E., 5-Off, *n*-Cat III	3.0000	2.0000	0.1429	0.2500	1.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	0.1250	0.2000	0.5000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 6-Off, *n*-Cat I	8.0000	7.0000	0.5000	1.0000	4.0000
W.E., 6-Off, *n*-Cat II	4.0000	3.0000	0.1667	0.3333	1.0000
W.E., 6-Off, *n*-Cat III	3.0000	2.0000	0.1429	0.2500	1.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	0.1250	0.2000	0.5000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 4-Off, *n*-Cat I	9.0000	8.0000	1.0000	2.0000	5.0000
W.E., 4-Off, *n*-Cat II	4.0000	3.0000	0.1667	0.3333	1.0000
W.E., 4-Off, *n*-Cat III	3.0000	2.0000	0.1429	0.2500	1.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	0.1250	0.2000	0.5000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.1667	0.3333
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.1667	0.3333
Sum		82.0000	7.4325	16.2000	42.3333

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., LTP, *n*-Cat III	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**
	Normalized Values	3.0000	2.0000	1.0000	1.0000
C_{Rn-222}	1.0000	0.5000	1.0000	1.0000	1.0000
Distance, LTP	10.0000	7.0000	8.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	0.5000	1.0000	1.0000	1.0000
Elevation	10.0000	7.0000	8.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	7.0000	4.0000	5.0000	6.0000	6.0000
W.E., LTP, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., LTP, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	5.0000	6.0000	7.0000	7.0000
W.E., 5-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 5-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	5.0000	6.0000	7.0000	7.0000
W.E., 6-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 6-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	6.0000	7.0000	8.0000	8.0000
W.E., 4-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 4-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
Sum		53.0000	68.0000	82.0000	82.0000

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., 5-Off, *n*-Cat I	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**
	Normalized Values	8.0000	4.0000	3.0000	2.0000
$C_{Rn\text{-}222}$	1.0000	0.1429	0.3333	0.5000	1.0000
Distance, LTP	10.0000	2.0000	6.0000	7.0000	8.0000
Distance, 5-Off	2.0000	0.1667	0.5000	1.0000	1.0000
Distance, 6-Off	2.0000	0.1667	0.5000	1.0000	1.0000
Distance, 4-Off	1.0000	0.1429	0.3333	0.5000	1.0000
Elevation	10.0000	2.0000	6.0000	7.0000	8.0000
W.E., LTP, *n*-Cat I	7.0000	1.0000	3.0000	4.0000	5.0000
W.E., LTP, *n*-Cat II	4.0000	0.2500	1.0000	1.0000	2.0000
W.E., LTP, *n*-Cat III	3.0000	0.2000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	2.0000	0.1667	0.5000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	1.0000	4.0000	5.0000	6.0000
W.E., 5-Off, *n*-Cat II	4.0000	0.2500	1.0000	1.0000	2.0000
W.E., 5-Off, *n*-Cat III	3.0000	0.2000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	2.0000	0.1667	0.5000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	1.0000	4.0000	5.0000	6.0000
W.E., 6-Off, *n*-Cat II	4.0000	0.2500	1.0000	1.0000	2.0000
W.E., 6-Off, *n*-Cat III	3.0000	0.2000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	2.0000	0.1667	0.5000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	1.0000	5.0000	6.0000	7.0000
W.E., 4-Off, *n*-Cat II	4.0000	0.2500	1.0000	1.0000	2.0000
W.E., 4-Off, *n*-Cat III	3.0000	0.2000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	2.0000	0.1667	0.5000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1429	0.3333	0.5000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1429	0.3333	0.5000	1.0000
Sum		12.2286	42.3333	53.0000	68.0000

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., 5-Off, *n*-Cat V	W.E., 5-Off, *n*-Cat VI	W.E., 6-Off, *n*-Cat I	W.E., 6-Off, *n*-Cat II
	Normalized Values	1.0000	1.0000	8.0000	4.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	1.0000	0.1429	0.3333
Distance, LTP	10.0000	9.0000	9.0000	2.0000	6.0000
Distance, 5-Off	2.0000	1.0000	1.0000	0.1667	0.5000
Distance, 6-Off	2.0000	1.0000	1.0000	0.1667	0.5000
Distance, 4-Off	1.0000	1.0000	1.0000	0.1429	0.3333
Elevation	10.0000	9.0000	9.0000	2.0000	6.0000
W.E., LTP, *n*-Cat I	7.0000	6.0000	6.0000	1.0000	3.0000
W.E., LTP, *n*-Cat II	4.0000	3.0000	3.0000	0.2500	1.0000
W.E., LTP, *n*-Cat III	3.0000	2.0000	2.0000	0.2000	1.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	1.0000	0.1667	0.5000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 5-Off, *n*-Cat I	8.0000	7.0000	7.0000	1.0000	4.0000
W.E., 5-Off, *n*-Cat II	4.0000	3.0000	3.0000	0.2500	1.0000
W.E., 5-Off, *n*-Cat III	3.0000	2.0000	2.0000	0.2000	1.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	1.0000	0.1667	0.5000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 6-Off, *n*-Cat I	8.0000	7.0000	7.0000	1.0000	4.0000
W.E., 6-Off, *n*-Cat II	4.0000	3.0000	3.0000	0.2500	1.0000
W.E., 6-Off, *n*-Cat III	3.0000	2.0000	2.0000	0.2000	1.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	1.0000	0.1667	0.5000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 4-Off, *n*-Cat I	9.0000	8.0000	8.0000	1.0000	5.0000
W.E., 4-Off, *n*-Cat II	4.0000	3.0000	3.0000	0.2500	1.0000
W.E., 4-Off, *n*-Cat III	3.0000	2.0000	2.0000	0.2000	1.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	1.0000	0.1667	0.5000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1429	0.3333
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1429	0.3333
Sum		82.0000	82.0000	12.2286	42.3333

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., 6-Off, *n*-Cat III	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**
	Normalized Values	3.0000	2.0000	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	0.5000	1.0000	1.0000	1.0000
Distance, LTP	10.0000	7.0000	8.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	0.5000	1.0000	1.0000	1.0000
Elevation	10.0000	7.0000	8.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	7.0000	4.0000	5.0000	6.0000	6.0000
W.E., LTP, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., LTP, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	5.0000	6.0000	7.0000	7.0000
W.E., 5-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 5-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	5.0000	6.0000	7.0000	7.0000
W.E., 6-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 6-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	6.0000	7.0000	8.0000	8.0000
W.E., 4-Off, *n*-Cat II	4.0000	1.0000	2.0000	3.0000	3.0000
W.E., 4-Off, *n*-Cat III	3.0000	1.0000	1.0000	2.0000	2.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.5000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.5000	1.0000	1.0000	1.0000
Sum		53.0000	68.0000	82.0000	82.0000

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., 4-Off, *n*-Cat I	W.E., 4-Off, *n*-Cat II	W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV
	Normalized Values	9.0000	4.0000	3.0000	2.0000
C_{Rn-222}	1.0000	0.1250	0.3333	0.5000	1.0000
Distance, LTP	10.0000	1.0000	6.0000	7.0000	8.0000
Distance, 5-Off	2.0000	0.1429	0.5000	1.0000	1.0000
Distance, 6-Off	2.0000	0.1429	0.5000	1.0000	1.0000
Distance, 4-Off	1.0000	0.1250	0.3333	0.5000	1.0000
Elevation	10.0000	1.0000	6.0000	7.0000	8.0000
W.E., LTP, *n*-Cat I	7.0000	0.5000	3.0000	4.0000	5.0000
W.E., LTP, *n*-Cat II	4.0000	0.2000	1.0000	1.0000	2.0000
W.E., LTP, *n*-Cat III	3.0000	0.1667	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	2.0000	0.1429	0.5000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	1.0000	4.0000	5.0000	6.0000
W.E., 5-Off, *n*-Cat II	4.0000	0.2000	1.0000	1.0000	2.0000
W.E., 5-Off, *n*-Cat III	3.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	2.0000	0.1429	0.5000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	1.0000	4.0000	5.0000	6.0000
W.E., 6-Off, *n*-Cat II	4.0000	0.2000	1.0000	1.0000	2.0000
W.E., 6-Off, *n*-Cat III	3.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	2.0000	0.1429	0.5000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	1.0000	5.0000	6.0000	7.0000
W.E., 4-Off, *n*-Cat II	4.0000	0.2000	1.0000	1.0000	2.0000
W.E., 4-Off, *n*-Cat III	3.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	2.0000	0.1429	0.5000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1250	0.3333	0.5000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1250	0.3333	0.5000	1.0000
Sum		9.0738	42.3333	53.0000	68.0000

Table 263 (Cont'd). Iterative Approach: Pairwise Comparison of MAUT Weighting Values.

		W.E., 4-Off, *n*-Cat V	**W.E., 4-Off, *n*-Cat VI**
	Normalized Values	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	1.0000
Distance, LTP	10.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	1.0000
Elevation	10.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	7.0000	6.0000	6.0000
W.E., LTP, *n*-Cat II	4.0000	3.0000	3.0000
W.E., LTP, *n*-Cat III	3.0000	2.0000	2.0000
W.E., LTP, *n*-Cat IV	2.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.0000	7.0000	7.0000
W.E., 5-Off, *n*-Cat II	4.0000	3.0000	3.0000
W.E., 5-Off, *n*-Cat III	3.0000	2.0000	2.0000
W.E., 5-Off, *n*-Cat IV	2.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.0000	7.0000	7.0000
W.E., 6-Off, *n*-Cat II	4.0000	3.0000	3.0000
W.E., 6-Off, *n*-Cat III	3.0000	2.0000	2.0000
W.E., 6-Off, *n*-Cat IV	2.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	9.0000	8.0000	8.0000
W.E., 4-Off, *n*-Cat II	4.0000	3.0000	3.0000
W.E., 4-Off, *n*-Cat III	3.0000	2.0000	2.0000
W.E., 4-Off, *n*-Cat IV	2.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000
Sum		82.0000	82.0000

Table 265. Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	Measured $C_{Rn\text{-}222}$	Distance from LTP	Distance from 5-Off	Distance from 6-Off
$C_{Rn\text{-}222}$	0.0122	0.0149	0.0147	0.0147
Distance, LTP	0.1098	0.1345	0.1176	0.1176
Distance, 5-Off	0.0122	0.0168	0.0147	0.0147
Distance, 6-Off	0.0122	0.0168	0.0147	0.0147
Distance, 4-Off	0.0122	0.0149	0.0147	0.0147
Elevation	0.1098	0.1345	0.1176	0.1176
W.E., LTP, *n*-Cat I	0.0732	0.0448	0.0735	0.0735
W.E., LTP, *n*-Cat II	0.0366	0.0224	0.0294	0.0294
W.E., LTP, *n*-Cat III	0.0244	0.0192	0.0147	0.0147
W.E., LTP, *n*-Cat IV	0.0122	0.0168	0.0147	0.0147
W.E., LTP, *n*-Cat V	0.0122	0.0149	0.0147	0.0147
W.E., LTP, *n*-Cat VI	0.0122	0.0149	0.0147	0.0147
W.E., 5-Off, *n*-Cat I	0.0854	0.0673	0.0882	0.0882
W.E., 5-Off, *n*-Cat II	0.0366	0.0224	0.0294	0.0294
W.E., 5-Off, *n*-Cat III	0.0244	0.0192	0.0147	0.0147
W.E., 5-Off, *n*-Cat IV	0.0122	0.0168	0.0147	0.0147
W.E., 5-Off, *n*-Cat V	0.0122	0.0149	0.0147	0.0147
W.E., 5-Off, *n*-Cat VI	0.0122	0.0149	0.0147	0.0147
W.E., 6-Off, *n*-Cat I	0.0854	0.0673	0.0882	0.0882
W.E., 6-Off, *n*-Cat II	0.0366	0.0224	0.0294	0.0294
W.E., 6-Off, *n*-Cat III	0.0244	0.0192	0.0147	0.0147
W.E., 6-Off, *n*-Cat IV	0.0122	0.0168	0.0147	0.0147
W.E., 6-Off, *n*-Cat V	0.0122	0.0149	0.0147	0.0147
W.E., 6-Off, *n*-Cat VI	0.0122	0.0149	0.0147	0.0147
W.E., 4-Off, *n*-Cat I	0.0976	0.1345	0.1029	0.1029
W.E., 4-Off, *n*-Cat II	0.0366	0.0224	0.0294	0.0294
W.E., 4-Off, *n*-Cat III	0.0244	0.0192	0.0147	0.0147
W.E., 4-Off, *n*-Cat IV	0.0122	0.0168	0.0147	0.0147
W.E., 4-Off, *n*-Cat V	0.0122	0.0149	0.0147	0.0147
W.E., 4-Off, *n*-Cat VI	0.0122	0.0149	0.0147	0.0147

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	Distance from 4-Off	Elevation	W.E., LTP, *n*-Cat I	W.E., LTP, *n*-Cat II
C_{Rn-222}	0.0122	0.0149	0.0103	0.0079
Distance, LTP	0.1098	0.1345	0.1852	0.1417
Distance, 5-Off	0.0122	0.0168	0.0123	0.0118
Distance, 6-Off	0.0122	0.0168	0.0123	0.0118
Distance, 4-Off	0.0122	0.0149	0.0103	0.0079
Elevation	0.1098	0.1345	0.1852	0.1417
W.E., LTP, *n*-Cat I	0.0732	0.0448	0.0617	0.0709
W.E., LTP, *n*-Cat II	0.0366	0.0224	0.0206	0.0236
W.E., LTP, *n*-Cat III	0.0244	0.0192	0.0154	0.0236
W.E., LTP, *n*-Cat IV	0.0122	0.0168	0.0123	0.0118
W.E., LTP, *n*-Cat V	0.0122	0.0149	0.0103	0.0079
W.E., LTP, *n*-Cat VI	0.0122	0.0149	0.0103	0.0079
W.E., 5-Off, *n*-Cat I	0.0854	0.0673	0.0617	0.0945
W.E., 5-Off, *n*-Cat II	0.0366	0.0224	0.0206	0.0236
W.E., 5-Off, *n*-Cat III	0.0244	0.0192	0.0154	0.0236
W.E., 5-Off, *n*-Cat IV	0.0122	0.0168	0.0123	0.0118
W.E., 5-Off, *n*-Cat V	0.0122	0.0149	0.0103	0.0079
W.E., 5-Off, *n*-Cat VI	0.0122	0.0149	0.0103	0.0079
W.E., 6-Off, *n*-Cat I	0.0854	0.0673	0.0617	0.0945
W.E., 6-Off, *n*-Cat II	0.0366	0.0224	0.0206	0.0236
W.E., 6-Off, *n*-Cat III	0.0244	0.0192	0.0154	0.0236
W.E., 6-Off, *n*-Cat IV	0.0122	0.0168	0.0123	0.0118
W.E., 6-Off, *n*-Cat V	0.0122	0.0149	0.0103	0.0079
W.E., 6-Off, *n*-Cat VI	0.0122	0.0149	0.0103	0.0079
W.E., 4-Off, *n*-Cat I	0.0976	0.1345	0.1235	0.1181
W.E., 4-Off, *n*-Cat II	0.0366	0.0224	0.0206	0.0236
W.E., 4-Off, *n*-Cat III	0.0244	0.0192	0.0154	0.0236
W.E., 4-Off, *n*-Cat IV	0.0122	0.0168	0.0123	0.0118
W.E., 4-Off, *n*-Cat V	0.0122	0.0149	0.0103	0.0079
W.E., 4-Off, *n*-Cat VI	0.0122	0.0149	0.0103	0.0079

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., LTP, *n*-Cat III	W.E., LTP, *n*-Cat IV	W.E., LTP, *n*-Cat V	W.E., LTP, *n*-Cat VI
$C_{Rn\text{-}222}$	0.0094	0.0147	0.0122	0.0122
Distance, LTP	0.1321	0.1176	0.1098	0.1098
Distance, 5-Off	0.0189	0.0147	0.0122	0.0122
Distance, 6-Off	0.0189	0.0147	0.0122	0.0122
Distance, 4-Off	0.0094	0.0147	0.0122	0.0122
Elevation	0.1321	0.1176	0.1098	0.1098
W.E., LTP, *n*-Cat I	0.0755	0.0735	0.0732	0.0732
W.E., LTP, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., LTP, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., LTP, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., LTP, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., LTP, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat I	0.0943	0.0882	0.0854	0.0854
W.E., 5-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 5-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 5-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat I	0.0943	0.0882	0.0854	0.0854
W.E., 6-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 6-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 6-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat I	0.1132	0.1029	0.0976	0.0976
W.E., 4-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 4-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 4-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., 5-Off, *n*-Cat I	W.E., 5-Off, *n*-Cat II	W.E., 5-Off, *n*-Cat III	W.E., 5-Off, *n*-Cat IV
$C_{Rn\text{-}222}$	0.0117	0.0079	0.0094	0.0147
Distance, LTP	0.1636	0.1417	0.1321	0.1176
Distance, 5-Off	0.0136	0.0118	0.0189	0.0147
Distance, 6-Off	0.0136	0.0118	0.0189	0.0147
Distance, 4-Off	0.0117	0.0079	0.0094	0.0147
Elevation	0.1636	0.1417	0.1321	0.1176
W.E., LTP, *n*-Cat I	0.0818	0.0709	0.0755	0.0735
W.E., LTP, *n*-Cat II	0.0204	0.0236	0.0189	0.0294
W.E., LTP, *n*-Cat III	0.0164	0.0236	0.0189	0.0147
W.E., LTP, *n*-Cat IV	0.0136	0.0118	0.0189	0.0147
W.E., LTP, *n*-Cat V	0.0117	0.0079	0.0094	0.0147
W.E., LTP, *n*-Cat VI	0.0117	0.0079	0.0094	0.0147
W.E., 5-Off, *n*-Cat I	0.0818	0.0945	0.0943	0.0882
W.E., 5-Off, *n*-Cat II	0.0204	0.0236	0.0189	0.0294
W.E., 5-Off, *n*-Cat III	0.0164	0.0236	0.0189	0.0147
W.E., 5-Off, *n*-Cat IV	0.0136	0.0118	0.0189	0.0147
W.E., 5-Off, *n*-Cat V	0.0117	0.0079	0.0094	0.0147
W.E., 5-Off, *n*-Cat VI	0.0117	0.0079	0.0094	0.0147
W.E., 6-Off, *n*-Cat I	0.0818	0.0945	0.0943	0.0882
W.E., 6-Off, *n*-Cat II	0.0204	0.0236	0.0189	0.0294
W.E., 6-Off, *n*-Cat III	0.0164	0.0236	0.0189	0.0147
W.E., 6-Off, *n*-Cat IV	0.0136	0.0118	0.0189	0.0147
W.E., 6-Off, *n*-Cat V	0.0117	0.0079	0.0094	0.0147
W.E., 6-Off, *n*-Cat VI	0.0117	0.0079	0.0094	0.0147
W.E., 4-Off, *n*-Cat I	0.0818	0.1181	0.1132	0.1029
W.E., 4-Off, *n*-Cat II	0.0204	0.0236	0.0189	0.0294
W.E., 4-Off, *n*-Cat III	0.0164	0.0236	0.0189	0.0147
W.E., 4-Off, *n*-Cat IV	0.0136	0.0118	0.0189	0.0147
W.E., 4-Off, *n*-Cat V	0.0117	0.0079	0.0094	0.0147
W.E., 4-Off, *n*-Cat VI	0.0117	0.0079	0.0094	0.0147

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., 5-Off, *n*-Cat V	**W.E., 5-Off, *n*-Cat VI**	**W.E., 6-Off, *n*-Cat I**	**W.E., 6-Off, *n*-Cat II**
C_{Rn-222}	0.0122	0.0122	0.0117	0.0079
Distance, LTP	0.1098	0.1098	0.1636	0.1417
Distance, 5-Off	0.0122	0.0122	0.0136	0.0118
Distance, 6-Off	0.0122	0.0122	0.0136	0.0118
Distance, 4-Off	0.0122	0.0122	0.0117	0.0079
Elevation	0.1098	0.1098	0.1636	0.1417
W.E., LTP, *n*-Cat I	0.0732	0.0732	0.0818	0.0709
W.E., LTP, *n*-Cat II	0.0366	0.0366	0.0204	0.0236
W.E., LTP, *n*-Cat III	0.0244	0.0244	0.0164	0.0236
W.E., LTP, *n*-Cat IV	0.0122	0.0122	0.0136	0.0118
W.E., LTP, *n*-Cat V	0.0122	0.0122	0.0117	0.0079
W.E., LTP, *n*-Cat VI	0.0122	0.0122	0.0117	0.0079
W.E., 5-Off, *n*-Cat I	0.0854	0.0854	0.0818	0.0945
W.E., 5-Off, *n*-Cat II	0.0366	0.0366	0.0204	0.0236
W.E., 5-Off, *n*-Cat III	0.0244	0.0244	0.0164	0.0236
W.E., 5-Off, *n*-Cat IV	0.0122	0.0122	0.0136	0.0118
W.E., 5-Off, *n*-Cat V	0.0122	0.0122	0.0117	0.0079
W.E., 5-Off, *n*-Cat VI	0.0122	0.0122	0.0117	0.0079
W.E., 6-Off, *n*-Cat I	0.0854	0.0854	0.0818	0.0945
W.E., 6-Off, *n*-Cat II	0.0366	0.0366	0.0204	0.0236
W.E., 6-Off, *n*-Cat III	0.0244	0.0244	0.0164	0.0236
W.E., 6-Off, *n*-Cat IV	0.0122	0.0122	0.0136	0.0118
W.E., 6-Off, *n*-Cat V	0.0122	0.0122	0.0117	0.0079
W.E., 6-Off, *n*-Cat VI	0.0122	0.0122	0.0117	0.0079
W.E., 4-Off, *n*-Cat I	0.0976	0.0976	0.0818	0.1181
W.E., 4-Off, *n*-Cat II	0.0366	0.0366	0.0204	0.0236
W.E., 4-Off, *n*-Cat III	0.0244	0.0244	0.0164	0.0236
W.E., 4-Off, *n*-Cat IV	0.0122	0.0122	0.0136	0.0118
W.E., 4-Off, *n*-Cat V	0.0122	0.0122	0.0117	0.0079
W.E., 4-Off, *n*-Cat VI	0.0122	0.0122	0.0117	0.0079

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., 6-Off, *n*-Cat III	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**
$C_{Rn\text{-}222}$	0.0094	0.0147	0.0122	0.0122
Distance, LTP	0.1321	0.1176	0.1098	0.1098
Distance, 5-Off	0.0189	0.0147	0.0122	0.0122
Distance, 6-Off	0.0189	0.0147	0.0122	0.0122
Distance, 4-Off	0.0094	0.0147	0.0122	0.0122
Elevation	0.1321	0.1176	0.1098	0.1098
W.E., LTP, *n*-Cat I	0.0755	0.0735	0.0732	0.0732
W.E., LTP, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., LTP, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., LTP, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., LTP, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., LTP, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat I	0.0943	0.0882	0.0854	0.0854
W.E., 5-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 5-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 5-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 5-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat I	0.0943	0.0882	0.0854	0.0854
W.E., 6-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 6-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 6-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 6-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat I	0.1132	0.1029	0.0976	0.0976
W.E., 4-Off, *n*-Cat II	0.0189	0.0294	0.0366	0.0366
W.E., 4-Off, *n*-Cat III	0.0189	0.0147	0.0244	0.0244
W.E., 4-Off, *n*-Cat IV	0.0189	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat V	0.0094	0.0147	0.0122	0.0122
W.E., 4-Off, *n*-Cat VI	0.0094	0.0147	0.0122	0.0122

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., 4-Off, *n*-Cat I	**W.E., 4-Off, *n*-Cat II**	**W.E., 4-Off, *n*-Cat III**	**W.E., 4-Off, *n*-Cat IV**
C_{Rn-222}	0.0138	0.0079	0.0094	0.0147
Distance, LTP	0.1102	0.1417	0.1321	0.1176
Distance, 5-Off	0.0157	0.0118	0.0189	0.0147
Distance, 6-Off	0.0157	0.0118	0.0189	0.0147
Distance, 4-Off	0.0138	0.0079	0.0094	0.0147
Elevation	0.1102	0.1417	0.1321	0.1176
W.E., LTP, *n*-Cat I	0.0551	0.0709	0.0755	0.0735
W.E., LTP, *n*-Cat II	0.0220	0.0236	0.0189	0.0294
W.E., LTP, *n*-Cat III	0.0184	0.0236	0.0189	0.0147
W.E., LTP, *n*-Cat IV	0.0157	0.0118	0.0189	0.0147
W.E., LTP, *n*-Cat V	0.0138	0.0079	0.0094	0.0147
W.E., LTP, *n*-Cat VI	0.0138	0.0079	0.0094	0.0147
W.E., 5-Off, *n*-Cat I	0.1102	0.0945	0.0943	0.0882
W.E., 5-Off, *n*-Cat II	0.0220	0.0236	0.0189	0.0294
W.E., 5-Off, *n*-Cat III	0.0184	0.0236	0.0189	0.0147
W.E., 5-Off, *n*-Cat IV	0.0157	0.0118	0.0189	0.0147
W.E., 5-Off, *n*-Cat V	0.0138	0.0079	0.0094	0.0147
W.E., 5-Off, *n*-Cat VI	0.0138	0.0079	0.0094	0.0147
W.E., 6-Off, *n*-Cat I	0.1102	0.0945	0.0943	0.0882
W.E., 6-Off, *n*-Cat II	0.0220	0.0236	0.0189	0.0294
W.E., 6-Off, *n*-Cat III	0.0184	0.0236	0.0189	0.0147
W.E., 6-Off, *n*-Cat IV	0.0157	0.0118	0.0189	0.0147
W.E., 6-Off, *n*-Cat V	0.0138	0.0079	0.0094	0.0147
W.E., 6-Off, *n*-Cat VI	0.0138	0.0079	0.0094	0.0147
W.E., 4-Off, *n*-Cat I	0.1102	0.1181	0.1132	0.1029
W.E., 4-Off, *n*-Cat II	0.0220	0.0236	0.0189	0.0294
W.E., 4-Off, *n*-Cat III	0.0184	0.0236	0.0189	0.0147
W.E., 4-Off, *n*-Cat IV	0.0157	0.0118	0.0189	0.0147
W.E., 4-Off, *n*-Cat V	0.0138	0.0079	0.0094	0.0147
W.E., 4-Off, *n*-Cat VI	0.0138	0.0079	0.0094	0.0147

Table 264 (Cont'd). Iterative Approach: Derivation of PVs from MAUT Weighting Values.

	W.E., 4-Off, *n*-Cat V	W.E., 4-Off, *n*-Cat VI	Priority Vector
$C_{Rn\text{-}222}$	0.0122	0.0122	0.0119
Distance, LTP	0.1098	0.1098	0.1263
Distance, 5-Off	0.0122	0.0122	0.0141
Distance, 6-Off	0.0122	0.0122	0.0141
Distance, 4-Off	0.0122	0.0122	0.0119
Elevation	0.1098	0.1098	0.1263
W.E., LTP, *n*-Cat I	0.0732	0.0732	0.0709
W.E., LTP, *n*-Cat II	0.0366	0.0366	0.0280
W.E., LTP, *n*-Cat III	0.0244	0.0244	0.0202
W.E., LTP, *n*-Cat IV	0.0122	0.0122	0.0141
W.E., LTP, *n*-Cat V	0.0122	0.0122	0.0119
W.E., LTP, *n*-Cat VI	0.0122	0.0122	0.0119
W.E., 5-Off, *n*-Cat I	0.0854	0.0854	0.0869
W.E., 5-Off, *n*-Cat II	0.0366	0.0366	0.0280
W.E., 5-Off, *n*-Cat III	0.0244	0.0244	0.0202
W.E., 5-Off, *n*-Cat IV	0.0122	0.0122	0.0141
W.E., 5-Off, *n*-Cat V	0.0122	0.0122	0.0119
W.E., 5-Off, *n*-Cat VI	0.0122	0.0122	0.0119
W.E., 6-Off, *n*-Cat I	0.0854	0.0854	0.0869
W.E., 6-Off, *n*-Cat II	0.0366	0.0366	0.0280
W.E., 6-Off, *n*-Cat III	0.0244	0.0244	0.0202
W.E., 6-Off, *n*-Cat IV	0.0122	0.0122	0.0141
W.E., 6-Off, *n*-Cat V	0.0122	0.0122	0.0119
W.E., 6-Off, *n*-Cat VI	0.0122	0.0122	0.0119
W.E., 4-Off, *n*-Cat I	0.0976	0.0976	0.1062
W.E., 4-Off, *n*-Cat II	0.0366	0.0366	0.0280
W.E., 4-Off, *n*-Cat III	0.0244	0.0244	0.0202
W.E., 4-Off, *n*-Cat IV	0.0122	0.0122	0.0141
W.E., 4-Off, *n*-Cat V	0.0122	0.0122	0.0119
W.E., 4-Off, *n*-Cat VI	0.0122	0.0122	0.0119

Table 266. Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values.

	Measured $C_{Rn\text{-}222}$	Distance from LTP	Distance from 5-Off	Distance from 6-Off
Priority Vector	**0.0119**	**0.1263**	**0.0141**	**0.0141**
$C_{Rn\text{-}222}$	0.0119	0.0140	0.0141	0.0141
Distance, LTP	0.1070	0.1263	0.1125	0.1125
Distance, 5-Off	0.0119	0.0158	0.0141	0.0141
Distance, 6-Off	0.0119	0.0158	0.0141	0.0141
Distance, 4-Off	0.0119	0.0140	0.0141	0.0141
Elevation	0.1070	0.1263	0.1125	0.1125
W.E., LTP, *n*-Cat I	0.0713	0.0421	0.0703	0.0703
W.E., LTP, *n*-Cat II	0.0357	0.0211	0.0281	0.0281
W.E., LTP, *n*-Cat III	0.0238	0.0180	0.0141	0.0141
W.E., LTP, *n*-Cat IV	0.0119	0.0158	0.0141	0.0141
W.E., LTP, *n*-Cat V	0.0119	0.0140	0.0141	0.0141
W.E., LTP, *n*-Cat VI	0.0119	0.0140	0.0141	0.0141
W.E., 5-Off, *n*-Cat I	0.0832	0.0632	0.0844	0.0844
W.E., 5-Off, *n*-Cat II	0.0357	0.0211	0.0281	0.0281
W.E., 5-Off, *n*-Cat III	0.0238	0.0180	0.0141	0.0141
W.E., 5-Off, *n*-Cat IV	0.0119	0.0158	0.0141	0.0141
W.E., 5-Off, *n*-Cat V	0.0119	0.0140	0.0141	0.0141
W.E., 5-Off, *n*-Cat VI	0.0119	0.0140	0.0141	0.0141
W.E., 6-Off, *n*-Cat I	0.0832	0.0632	0.0844	0.0844
W.E., 6-Off, *n*-Cat II	0.0357	0.0211	0.0281	0.0281
W.E., 6-Off, *n*-Cat III	0.0238	0.0180	0.0141	0.0141
W.E., 6-Off, *n*-Cat IV	0.0119	0.0158	0.0141	0.0141
W.E., 6-Off, *n*-Cat V	0.0119	0.0140	0.0141	0.0141
W.E., 6-Off, *n*-Cat VI	0.0119	0.0140	0.0141	0.0141
W.E., 4-Off, *n*-Cat I	0.0951	0.1263	0.0984	0.0984
W.E., 4-Off, *n*-Cat II	0.0357	0.0211	0.0281	0.0281
W.E., 4-Off, *n*-Cat III	0.0238	0.0180	0.0141	0.0141
W.E., 4-Off, *n*-Cat IV	0.0119	0.0158	0.0141	0.0141
W.E., 4-Off, *n*-Cat V	0.0119	0.0140	0.0141	0.0141
W.E., 4-Off, *n*-Cat VI	0.0119	0.0140	0.0141	0.0141

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	Distance from 4-Off	**Elevation**	**W.E., LTP, *n*-Cat I**	**W.E., LTP, *n*-Cat II**
Priority Vector	**0.0119**	**0.1263**	**0.0709**	**0.0280**
$C_{Rn\text{-}222}$	0.0119	0.0140	0.0118	0.0093
Distance, LTP	0.1070	0.1263	0.2128	0.1681
Distance, 5-Off	0.0119	0.0158	0.0142	0.0140
Distance, 6-Off	0.0119	0.0158	0.0142	0.0140
Distance, 4-Off	0.0119	0.0140	0.0118	0.0093
Elevation	0.1070	0.1263	0.2128	0.1681
W.E., LTP, *n*-Cat I	0.0713	0.0421	0.0709	0.0841
W.E., LTP, *n*-Cat II	0.0357	0.0211	0.0236	0.0280
W.E., LTP, *n*-Cat III	0.0238	0.0180	0.0177	0.0280
W.E., LTP, *n*-Cat IV	0.0119	0.0158	0.0142	0.0140
W.E., LTP, *n*-Cat V	0.0119	0.0140	0.0118	0.0093
W.E., LTP, *n*-Cat VI	0.0119	0.0140	0.0118	0.0093
W.E., 5-Off, *n*-Cat I	0.0832	0.0632	0.0709	0.1121
W.E., 5-Off, *n*-Cat II	0.0357	0.0211	0.0236	0.0280
W.E., 5-Off, *n*-Cat III	0.0238	0.0180	0.0177	0.0280
W.E., 5-Off, *n*-Cat IV	0.0119	0.0158	0.0142	0.0140
W.E., 5-Off, *n*-Cat V	0.0119	0.0140	0.0118	0.0093
W.E., 5-Off, *n*-Cat VI	0.0119	0.0140	0.0118	0.0093
W.E., 6-Off, *n*-Cat I	0.0832	0.0632	0.0709	0.1121
W.E., 6-Off, *n*-Cat II	0.0357	0.0211	0.0236	0.0280
W.E., 6-Off, *n*-Cat III	0.0238	0.0180	0.0177	0.0280
W.E., 6-Off, *n*-Cat IV	0.0119	0.0158	0.0142	0.0140
W.E., 6-Off, *n*-Cat V	0.0119	0.0140	0.0118	0.0093
W.E., 6-Off, *n*-Cat VI	0.0119	0.0140	0.0118	0.0093
W.E., 4-Off, *n*-Cat I	0.0951	0.1263	0.1419	0.1401
W.E., 4-Off, *n*-Cat II	0.0357	0.0211	0.0236	0.0280
W.E., 4-Off, *n*-Cat III	0.0238	0.0180	0.0177	0.0280
W.E., 4-Off, *n*-Cat IV	0.0119	0.0158	0.0142	0.0140
W.E., 4-Off, *n*-Cat V	0.0119	0.0140	0.0118	0.0093
W.E., 4-Off, *n*-Cat VI	0.0119	0.0140	0.0118	0.0093

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	W.E., LTP, *n*-Cat III	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**
Priority Vector	**0.0202**	**0.0141**	**0.0119**	**0.0119**
$C_{\mathbf{Rn\text{-}222}}$	0.0101	0.0141	0.0119	0.0119
Distance, LTP	0.1416	0.1125	0.1070	0.1070
Distance, 5-Off	0.0202	0.0141	0.0119	0.0119
Distance, 6-Off	0.0202	0.0141	0.0119	0.0119
Distance, 4-Off	0.0101	0.0141	0.0119	0.0119
Elevation	0.1416	0.1125	0.1070	0.1070
W.E., LTP, *n*-Cat I	0.0809	0.0703	0.0713	0.0713
W.E., LTP, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., LTP, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., LTP, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., LTP, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., LTP, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat I	0.1012	0.0844	0.0832	0.0832
W.E., 5-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 5-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 5-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat I	0.1012	0.0844	0.0832	0.0832
W.E., 6-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 6-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 6-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat I	0.1214	0.0984	0.0951	0.0951
W.E., 4-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 4-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 4-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	W.E., 5-Off, *n*-Cat I	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**
Priority Vector	**0.0869**	**0.0280**	**0.0202**	**0.0141**
$C_{Rn\text{-}222}$	0.0124	0.0093	0.0101	0.0141
Distance, LTP	0.1739	0.1681	0.1416	0.1125
Distance, 5-Off	0.0145	0.0140	0.0202	0.0141
Distance, 6-Off	0.0145	0.0140	0.0202	0.0141
Distance, 4-Off	0.0124	0.0093	0.0101	0.0141
Elevation	0.1739	0.1681	0.1416	0.1125
W.E., LTP, *n*-Cat I	0.0869	0.0841	0.0809	0.0703
W.E., LTP, *n*-Cat II	0.0217	0.0280	0.0202	0.0281
W.E., LTP, *n*-Cat III	0.0174	0.0280	0.0202	0.0141
W.E., LTP, *n*-Cat IV	0.0145	0.0140	0.0202	0.0141
W.E., LTP, *n*-Cat V	0.0124	0.0093	0.0101	0.0141
W.E., LTP, *n*-Cat VI	0.0124	0.0093	0.0101	0.0141
W.E., 5-Off, *n*-Cat I	0.0869	0.1121	0.1012	0.0844
W.E., 5-Off, *n*-Cat II	0.0217	0.0280	0.0202	0.0281
W.E., 5-Off, *n*-Cat III	0.0174	0.0280	0.0202	0.0141
W.E., 5-Off, *n*-Cat IV	0.0145	0.0140	0.0202	0.0141
W.E., 5-Off, *n*-Cat V	0.0124	0.0093	0.0101	0.0141
W.E., 5-Off, *n*-Cat VI	0.0124	0.0093	0.0101	0.0141
W.E., 6-Off, *n*-Cat I	0.0869	0.1121	0.1012	0.0844
W.E., 6-Off, *n*-Cat II	0.0217	0.0280	0.0202	0.0281
W.E., 6-Off, *n*-Cat III	0.0174	0.0280	0.0202	0.0141
W.E., 6-Off, *n*-Cat IV	0.0145	0.0140	0.0202	0.0141
W.E., 6-Off, *n*-Cat V	0.0124	0.0093	0.0101	0.0141
W.E., 6-Off, *n*-Cat VI	0.0124	0.0093	0.0101	0.0141
W.E., 4-Off, *n*-Cat I	0.0869	0.1401	0.1214	0.0984
W.E., 4-Off, *n*-Cat II	0.0217	0.0280	0.0202	0.0281
W.E., 4-Off, *n*-Cat III	0.0174	0.0280	0.0202	0.0141
W.E., 4-Off, *n*-Cat IV	0.0145	0.0140	0.0202	0.0141
W.E., 4-Off, *n*-Cat V	0.0124	0.0093	0.0101	0.0141
W.E., 4-Off, *n*-Cat VI	0.0124	0.0093	0.0101	0.0141

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	W.E., 5-Off, *n*-Cat V	**W.E., 5-Off, *n*-Cat VI**	**W.E., 6-Off, *n*-Cat I**	**W.E., 6-Off, *n*-Cat II**
Priority Vector	**0.0119**	**0.0119**	**0.0869**	**0.0280**
$C_{Rn\text{-}222}$	0.0119	0.0119	0.0124	0.0093
Distance, LTP	0.1070	0.1070	0.1739	0.1681
Distance, 5-Off	0.0119	0.0119	0.0145	0.0140
Distance, 6-Off	0.0119	0.0119	0.0145	0.0140
Distance, 4-Off	0.0119	0.0119	0.0124	0.0093
Elevation	0.1070	0.1070	0.1739	0.1681
W.E., LTP, *n*-Cat I	0.0713	0.0713	0.0869	0.0841
W.E., LTP, *n*-Cat II	0.0357	0.0357	0.0217	0.0280
W.E., LTP, *n*-Cat III	0.0238	0.0238	0.0174	0.0280
W.E., LTP, *n*-Cat IV	0.0119	0.0119	0.0145	0.0140
W.E., LTP, *n*-Cat V	0.0119	0.0119	0.0124	0.0093
W.E., LTP, *n*-Cat VI	0.0119	0.0119	0.0124	0.0093
W.E., 5-Off, *n*-Cat I	0.0832	0.0832	0.0869	0.1121
W.E., 5-Off, *n*-Cat II	0.0357	0.0357	0.0217	0.0280
W.E., 5-Off, *n*-Cat III	0.0238	0.0238	0.0174	0.0280
W.E., 5-Off, *n*-Cat IV	0.0119	0.0119	0.0145	0.0140
W.E., 5-Off, *n*-Cat V	0.0119	0.0119	0.0124	0.0093
W.E., 5-Off, *n*-Cat VI	0.0119	0.0119	0.0124	0.0093
W.E., 6-Off, *n*-Cat I	0.0832	0.0832	0.0869	0.1121
W.E., 6-Off, *n*-Cat II	0.0357	0.0357	0.0217	0.0280
W.E., 6-Off, *n*-Cat III	0.0238	0.0238	0.0174	0.0280
W.E., 6-Off, *n*-Cat IV	0.0119	0.0119	0.0145	0.0140
W.E., 6-Off, *n*-Cat V	0.0119	0.0119	0.0124	0.0093
W.E., 6-Off, *n*-Cat VI	0.0119	0.0119	0.0124	0.0093
W.E., 4-Off, *n*-Cat I	0.0951	0.0951	0.0869	0.1401
W.E., 4-Off, *n*-Cat II	0.0357	0.0357	0.0217	0.0280
W.E., 4-Off, *n*-Cat III	0.0238	0.0238	0.0174	0.0280
W.E., 4-Off, *n*-Cat IV	0.0119	0.0119	0.0145	0.0140
W.E., 4-Off, *n*-Cat V	0.0119	0.0119	0.0124	0.0093
W.E., 4-Off, *n*-Cat VI	0.0119	0.0119	0.0124	0.0093

Table 265 (Cont'd). Iterative Approach: Consistency
Check for Pairwise Comparison of MAUT Weighting Values

	W.E., 6-Off, *n*-Cat III	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**
Priority Vector	**0.0202**	**0.0141**	**0.0119**	**0.0119**
$C_{Rn\text{-}222}$	0.0101	0.0141	0.0119	0.0119
Distance, LTP	0.1416	0.1125	0.1070	0.1070
Distance, 5-Off	0.0202	0.0141	0.0119	0.0119
Distance, 6-Off	0.0202	0.0141	0.0119	0.0119
Distance, 4-Off	0.0101	0.0141	0.0119	0.0119
Elevation	0.1416	0.1125	0.1070	0.1070
W.E., LTP, *n*-Cat I	0.0809	0.0703	0.0713	0.0713
W.E., LTP, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., LTP, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., LTP, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., LTP, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., LTP, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat I	0.1012	0.0844	0.0832	0.0832
W.E., 5-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 5-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 5-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 5-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat I	0.1012	0.0844	0.0832	0.0832
W.E., 6-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 6-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 6-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 6-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat I	0.1214	0.0984	0.0951	0.0951
W.E., 4-Off, *n*-Cat II	0.0202	0.0281	0.0357	0.0357
W.E., 4-Off, *n*-Cat III	0.0202	0.0141	0.0238	0.0238
W.E., 4-Off, *n*-Cat IV	0.0202	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat V	0.0101	0.0141	0.0119	0.0119
W.E., 4-Off, *n*-Cat VI	0.0101	0.0141	0.0119	0.0119

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	W.E., 4-Off, *n*-Cat I	**W.E., 4-Off, *n*-Cat II**	**W.E., 4-Off, *n*-Cat III**	**W.E., 4-Off, *n*-Cat IV**
Priority Vector	**0.1062**	**0.0280**	**0.0202**	**0.0141**
$C_{Rn\text{-}222}$	0.0133	0.0093	0.0101	0.0141
Distance, LTP	0.1062	0.1681	0.1416	0.1125
Distance, 5-Off	0.0152	0.0140	0.0202	0.0141
Distance, 6-Off	0.0152	0.0140	0.0202	0.0141
Distance, 4-Off	0.0133	0.0093	0.0101	0.0141
Elevation	0.1062	0.1681	0.1416	0.1125
W.E., LTP, *n*-Cat I	0.0531	0.0841	0.0809	0.0703
W.E., LTP, *n*-Cat II	0.0212	0.0280	0.0202	0.0281
W.E., LTP, *n*-Cat III	0.0177	0.0280	0.0202	0.0141
W.E., LTP, *n*-Cat IV	0.0152	0.0140	0.0202	0.0141
W.E., LTP, *n*-Cat V	0.0133	0.0093	0.0101	0.0141
W.E., LTP, *n*-Cat VI	0.0133	0.0093	0.0101	0.0141
W.E., 5-Off, *n*-Cat I	0.1062	0.1121	0.1012	0.0844
W.E., 5-Off, *n*-Cat II	0.0212	0.0280	0.0202	0.0281
W.E., 5-Off, *n*-Cat III	0.0177	0.0280	0.0202	0.0141
W.E., 5-Off, *n*-Cat IV	0.0152	0.0140	0.0202	0.0141
W.E., 5-Off, *n*-Cat V	0.0133	0.0093	0.0101	0.0141
W.E., 5-Off, *n*-Cat VI	0.0133	0.0093	0.0101	0.0141
W.E., 6-Off, *n*-Cat I	0.1062	0.1121	0.1012	0.0844
W.E., 6-Off, *n*-Cat II	0.0212	0.0280	0.0202	0.0281
W.E., 6-Off, *n*-Cat III	0.0177	0.0280	0.0202	0.0141
W.E., 6-Off, *n*-Cat IV	0.0152	0.0140	0.0202	0.0141
W.E., 6-Off, *n*-Cat V	0.0133	0.0093	0.0101	0.0141
W.E., 6-Off, *n*-Cat VI	0.0133	0.0093	0.0101	0.0141
W.E., 4-Off, *n*-Cat I	0.1062	0.1401	0.1214	0.0984
W.E., 4-Off, *n*-Cat II	0.0212	0.0280	0.0202	0.0281
W.E., 4-Off, *n*-Cat III	0.0177	0.0280	0.0202	0.0141
W.E., 4-Off, *n*-Cat IV	0.0152	0.0140	0.0202	0.0141
W.E., 4-Off, *n*-Cat V	0.0133	0.0093	0.0101	0.0141
W.E., 4-Off, *n*-Cat VI	0.0133	0.0093	0.0101	0.0141

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

	W.E., 4-Off, *n*-Cat V	**W.E., 4-Off, *n*-Cat VI**	**WS**	**WS / PV**
Priority Vector	**0.0119**	**0.0119**	1.0000	
$C_{Rn\text{-}222}$	0.0119	0.0119	0.3591	30.2010
Distance, LTP	0.1070	0.1070	3.9038	30.8988
Distance, 5-Off	0.0119	0.0119	0.4302	30.5910
Distance, 6-Off	0.0119	0.0119	0.4302	30.5910
Distance, 4-Off	0.0119	0.0119	0.3591	30.2010
Elevation	0.1070	0.1070	3.9038	30.8988
W.E., LTP, *n*-Cat I	0.0713	0.0713	2.1775	30.6938
W.E., LTP, *n*-Cat II	0.0357	0.0357	0.8490	30.2982
W.E., LTP, *n*-Cat III	0.0238	0.0238	0.6215	30.7161
W.E., LTP, *n*-Cat IV	0.0119	0.0119	0.4302	30.5910
W.E., LTP, *n*-Cat V	0.0119	0.0119	0.3591	30.2010
W.E., LTP, *n*-Cat VI	0.0119	0.0119	0.3591	30.2010
W.E., 5-Off, *n*-Cat I	0.0832	0.0832	2.6690	30.6974
W.E., 5-Off, *n*-Cat II	0.0357	0.0357	0.8490	30.2982
W.E., 5-Off, *n*-Cat III	0.0238	0.0238	0.6215	30.7161
W.E., 5-Off, *n*-Cat IV	0.0119	0.0119	0.4302	30.5910
W.E., 5-Off, *n*-Cat V	0.0119	0.0119	0.3591	25.5379
W.E., 5-Off, *n*-Cat VI	0.0119	0.0119	0.3591	30.2010
W.E., 6-Off, *n*-Cat I	0.0832	0.0832	2.6690	224.4499
W.E., 6-Off, *n*-Cat II	0.0357	0.0357	0.8490	9.7645
W.E., 6-Off, *n*-Cat III	0.0238	0.0238	0.6215	22.1810
W.E., 6-Off, *n*-Cat IV	0.0119	0.0119	0.4302	21.2601
W.E., 6-Off, *n*-Cat V	0.0119	0.0119	0.3591	25.5379
W.E., 6-Off, *n*-Cat VI	0.0119	0.0119	0.3591	30.2010
W.E., 4-Off, *n*-Cat I	0.0951	0.0951	3.2627	274.3681
W.E., 4-Off, *n*-Cat II	0.0357	0.0357	0.8490	7.9972
W.E., 4-Off, *n*-Cat III	0.0238	0.0238	0.6215	22.1810
W.E., 4-Off, *n*-Cat IV	0.0119	0.0119	0.4302	21.2601
W.E., 4-Off, *n*-Cat V	0.0119	0.0119	0.3591	25.5379
W.E., 4-Off, *n*-Cat VI	0.0119	0.0119	0.3591	30.2010

Table 265 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of MAUT Weighting Values

Size of *n*	30.0000
Sum	1259.0639
Sum / *n* = λ_{max}	41.9688
CI	0.4127
RI	1.5772
CR	0.2617

Table 267. Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**W.E., LTP, *n*-Cat I**	**W.E., LTP, *n*-Cat II**	**W.E., LTP, *n*-Cat III**	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**	**W.E., 5-Off, *n*-Cat I**	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**	**W.E., 5-Off, *n*-Cat V**	**W.E., 5-Off, *n*-Cat VI**
GOAL LEVEL Weighting Factor	0.0709	0.0280	0.0202	0.0141	0.0119	0.0119	0.0869	0.0280	0.0202	0.0141	0.0119	0.0119
1	0.0897	0.0186	0.0176	0.0190	0.0197	0.0245	0.0249	0.0136	0.0131	0.0345	0.0587	0.1210
2	0.0891	0.1539	0.1174	0.0372	0.0176	0.0135	0.0774	0.0367	0.0500	0.0441	0.0345	0.0580
3	0.0916	0.0419	0.0280	0.0158	0.0169	0.0393	0.0774	0.0367	0.0500	0.0441	0.0345	0.0580
4	0.0828	0.0446	0.0438	0.1713	0.1855	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
5	0.0106	0.0137	0.0302	0.1592	0.1855	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
6	0.0768	0.1419	0.2462	0.2093	0.1855	0.1542	0.0352	0.0355	0.0513	0.1519	0.1543	0.1210
7	0.0799	0.0408	0.0404	0.0948	0.1391	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
1A	0.1066	0.0224	0.0289	0.0375	0.0606	0.0709	0.0249	0.0136	0.0131	0.0345	0.0587	0.1210
1-Off	0.0930	0.1149	0.1099	0.0893	0.0540	0.0384	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
2-Off	0.0891	0.1539	0.1174	0.0372	0.0176	0.0135	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
3-Off	0.1024	0.1581	0.1636	0.0852	0.0444	0.0405	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
16	0.0883	0.0952	0.0567	0.0444	0.0737	0.1424	0.0127	0.0549	0.2139	0.1616	0.1543	0.1210

Table 266 (Cont'd.). Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	W.E., 6-Off, *n*-Cat I	W.E., 6-Off, *n*-Cat II	W.E., 6-Off, *n*-Cat III	W.E., 6-Off, *n*-Cat IV	W.E., 6-Off, *n*-Cat V	W.E., 6-Off, *n*-Cat VI	W.E., 4-Off, *n*-Cat I	W.E., 4-Off, *n*-Cat II	W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV	W.E., 4-Off, *n*-Cat V	W.E., 4-Off, *n*-Cat VI
GOAL LEVEL Weighting Factor	0.0869	0.0280	0.0202	0.0141	0.0119	0.0119	0.1062	0.0280	0.0202	0.0141	0.0119	0.0119
1	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
2	0.0864	0.0542	0.0476	0.0889	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
3	0.1156	0.0627	0.0362	0.0919	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
4	0.1690	0.1702	0.1295	0.1249	0.0975	0.0976	0.0137	0.0458	0.1280	0.1032	0.1032	0.1043
5	0.1690	0.1702	0.1295	0.1249	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
6	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.1832	0.1085	0.0970	0.1032	0.1032	0.1043
7	0.0864	0.0542	0.0476	0.0889	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
1A	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
1-Off	0.0127	0.0123	0.0116	0.0294	0.0975	0.0976	0.1039	0.0351	0.0213	0.0168	0.0167	0.0255
2-Off	0.1089	0.0795	0.0488	0.0121	0.0106	0.0107	0.1039	0.0329	0.0334	0.0438	0.0441	0.0255
3-Off	0.1021	0.0575	0.0507	0.0121	0.0140	0.0130	0.0805	0.0114	0.0106	0.0106	0.0106	0.0105
16	0.0371	0.0862	0.1569	0.1249	0.0975	0.0976	0.1832	0.1085	0.0970	0.1032	0.1032	0.1043

Table 266 (Cont'd.). Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**Distance from TLP**	**Distance from 5-Off**	**Distance from 6-Off**	**Distance from 4-Off**	**Measured $C_{Rn\text{-}222}$**	**Elevation**	***GLOBAL PRIORITY***
GOAL LEVEL Weighting Factor	0.1263	0.0141	0.0141	0.0119	0.0119	0.1263	
1	0.0298	0.0334	0.0481	0.0790	0.0478	0.0447	***0.0565***
2	0.0308	0.0709	0.0479	0.0450	0.0559	0.0376	***0.0687***
3	0.0312	0.1053	0.0767	0.0527	0.0308	0.0819	***0.0642***
4	0.0284	0.1807	0.2008	0.0824	0.0631	0.0467	***0.0939***
5	0.0296	0.1107	0.1426	0.1170	0.0590	0.0461	***0.0874***
6	0.0293	0.0561	0.1562	0.1606	0.0319	0.0485	***0.0870***
7	0.0343	0.1457	0.1435	0.0616	0.0558	0.0546	***0.0807***
1A	0.0313	0.0237	0.0496	0.0825	0.4231	0.0508	***0.0646***
1-Off	0.1428	0.0326	0.0160	0.0467	0.0590	0.3985	***0.1143***
2-Off	0.2002	0.0605	0.0161	0.0335	0.0597	0.0534	***0.0873***
3-Off	0.2693	0.1670	0.0527	0.0148	0.0570	0.0737	***0.0980***
16	0.1431	0.0132	0.0500	0.2240	0.0570	0.0634	***0.0974***

Table 268. Iterative Approach: Summary of Global Priorities.

Decision Problem Alternative	Aggregated Global Priority
Location 1	0.0565
Location 2	0.0687
Location 3	0.0642
Location 4	0.0939
Location 5	0.0874
Location 6	0.0870
Location 7	0.0807
Location 1A	0.0646
Location 1-Off	**0.1143**
Location 2-Off	0.0873
Location 3-Off	0.0980
Location 16	0.0974

As has been done previously, the sensitivity analysis for the AHP-style analysis above is subjected to the same what-if scenarios. The effects of those deliberate manipulations on the outcome (*i.e.,* the alternatives ranking) are provided in Table 269.

Table 269. Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	As-Is				**What-If Scenario I**			
	What Changed? Nothing.				**What Changed? *All Criteria PV Weights Equalized.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
C_{Rn-222}	0.0119	1st	Loc. 1-Off	0.1143	0.0333	1st	Loc. 4	0.1163
Distance, LTP	0.1263	2nd	Loc. 3-Off	0.0980	0.0333	2nd	Loc. 6	0.1092
Distance, 5-Off	0.0141	3rd	Loc. 16	0.0974	0.0333	3rd	Loc. 5	0.1091
Distance, 6-Off	0.0141	4th	Loc. 4	0.0939	0.0333	4th	Loc. 16	0.1023
Distance, 4-Off	0.0119	5th	Loc. 5	0.0874	0.0333	5th	Loc. 7	0.0981
Elevation	0.1263	6th	Loc. 2-Off	0.0873	0.0333	6th	Loc. 1A	0.0811
W.E., LTP, *n*-Cat I	0.0709	7th	Loc. 6	0.0870	0.0333	7th	Loc. 2	0.0713
W.E., LTP, *n*-Cat II	0.0280	8th	Loc. 7	0.0807	0.0333	8th	Loc. 1-Ogg	0.0652
W.E., LTP, *n*-Cat III	0.0202	9th	Loc. 2	0.0687	0.0333	9th	Loc. 3	0.0640
W.E., LTP, *n*-Cat IV	0.0141	10th	Loc. 1A	0.0646	0.0333	10th	Loc. 1	0.0639
W.E., LTP, *n*-Cat V	0.0119	11th	Loc. 3	0.0642	0.0333	11th	Loc. 3-Off	0.0631
W.E., LTP, *n*-Cat VI	0.0119	12th	Loc. 1	0.0565	0.0333	12th	Loc. 2-Off	0.0563
W.E., 5-Off, *n*-Cat I	0.0869				0.0333			
W.E., 5-Off, *n*-Cat II	0.0280				0.0333			
W.E., 5-Off, *n*-Cat III	0.0202				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0141				0.0333			
W.E., 5-Off, *n*-Cat V	0.0119				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0119				0.0333			
W.E., 6-Off, *n*-Cat I	0.0869				0.0333			
W.E., 6-Off, *n*-Cat II	0.0280				0.0333			
W.E., 6-Off, *n*-Cat III	0.0202				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0141				0.0333			
W.E., 6-Off, *n*-Cat V	0.0119				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0119				0.0333			
W.E., 4-Off, *n*-Cat I	0.1062				0.0333			
W.E., 4-Off, *n*-Cat II	0.0280				0.0333			
W.E., 4-Off, *n*-Cat III	0.0202				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0141				0.0333			
W.E., 4-Off, *n*-Cat V	0.0119				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0119				0.0333			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	What-If Scenario II				**What-If Scenario III**			
	What Changed? ***All Wind-Related PV Weights Reduced 10% from Original "As-Is" Values.***				**What Changed?** ***All Wind-Related PV Weights Reduced 20% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{\mathbf{Rn\text{-}222}}$	0.0128	1st	Loc. 1-Off	0.1181	0.0138	1st	Loc. 1-Off	0.1226
Distance, LTP	0.1358	2nd	Loc. 3-Off	0.0998	0.1468	2nd	Loc. 3-Off	0.1020
Distance, 5-Off	0.0151	3rd	Loc. 16	0.0974	0.0163	3rd	Loc. 16	0.0975
Distance, 6-Off	0.0151	4th	Loc. 4	0.0926	0.0163	4th	Loc. 4	0.0911
Distance, 4-Off	0.0128	5th	Loc. 2-Off	0.0881	0.0138	5th	Loc. 2-Off	0.0891
Elevation	0.1358	6th	Loc. 5	0.0862	0.1468	6th	Loc. 5	0.0848
W.E., LTP, *n*-Cat I	0.0686	7th	Loc. 6	0.0858	0.0659	7th	Loc. 6	0.0844
W.E., LTP, *n*-Cat II	0.0271	8th	Loc. 7	0.0799	0.0260	8th	Loc. 7	0.0789
W.E., LTP, *n*-Cat III	0.0196	9th	Loc. 2	0.0677	0.0188	9th	Loc. 2	0.0665
W.E., LTP, *n*-Cat IV	0.0136	10th	Loc. 1A	0.0644	0.0131	10th	Loc. 1A	0.0641
W.E., LTP, *n*-Cat V	0.0115	11th	Loc. 3	0.0640	0.0111	11th	Loc. 3	0.0638
W.E., LTP, *n*-Cat VI	0.0115	12th	Loc. 1	0.0559	0.0111	12th	Loc. 1	0.0553
W.E., 5-Off, *n*-Cat I	0.0841				0.0808			
W.E., 5-Off, *n*-Cat II	0.0271				0.0260			
W.E., 5-Off, *n*-Cat III	0.0196				0.0188			
W.E., 5-Off, *n*-Cat IV	0.0136				0.0131			
W.E., 5-Off, *n*-Cat V	0.0115				0.0111			
W.E., 5-Off, *n*-Cat VI	0.0115				0.0111			
W.E., 6-Off, *n*-Cat I	0.0841				0.0808			
W.E., 6-Off, *n*-Cat II	0.0271				0.0260			
W.E., 6-Off, *n*-Cat III	0.0196				0.0188			
W.E., 6-Off, *n*-Cat IV	0.0136				0.0131			
W.E., 6-Off, *n*-Cat V	0.0115				0.0111			
W.E., 6-Off, *n*-Cat VI	0.0115				0.0111			
W.E., 4-Off, *n*-Cat I	0.1027				0.0986			
W.E., 4-Off, *n*-Cat II	0.0271				0.0260			
W.E., 4-Off, *n*-Cat III	0.0196				0.0188			
W.E., 4-Off, *n*-Cat IV	0.0136				0.0131			
W.E., 4-Off, *n*-Cat V	0.0115				0.0111			
W.E., 4-Off, *n*-Cat VI	0.0115				0.0111			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	What-If Scenario IV				**What-If Scenario V**			
	What Changed? ***All Wind-Related PV Weights Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related PV Weights Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0182	1st	Loc. 1-Off	0.1415	0.0121	1st	Loc. 1-Off	0.1143
Distance, LTP	0.1937	2nd	Loc. 3-Off	0.1113	0.1156	2nd	Loc. 16	0.0968
Distance, 5-Off	0.0216	3rd	Loc. 16	0.0979	0.0129	3rd	Loc. 3-Off	0.0958
Distance, 6-Off	0.0216	4th	Loc. 2-Off	0.0932	0.0129	4th	Loc. 4	0.0944
Distance, 4-Off	0.0182	5th	Loc. 4	0.0847	0.0109	5th	Loc. 5	0.0880
Elevation	0.1937	6th	Loc. 5	0.0787	0.1285	6th	Loc. 6	0.0876
W.E., LTP, *n*-Cat I	0.0544	7th	Loc. 6	0.0783	0.0721	7th	Loc. 2-Off	0.0861
W.E., LTP, *n*-Cat II	0.0215	8th	Loc. 7	0.0747	0.0285	8th	Loc. 7	0.0811
W.E., LTP, *n*-Cat III	0.0155	9th	Loc. 3	0.0629	0.0206	9th	Loc. 2	0.0693
W.E., LTP, *n*-Cat IV	0.0108	10th	Loc. 1A	0.0629	0.0143	10th	Loc. 1A	0.0651
W.E., LTP, *n*-Cat V	0.0091	11th	Loc. 2	0.0615	0.0121	11th	Loc. 3	0.0646
W.E., LTP, *n*-Cat VI	0.0091	12th	Loc. 1	0.0525	0.0121	12th	Loc. 1	0.0568
W.E., 5-Off, *n*-Cat I	0.0666				0.0884			
W.E., 5-Off, *n*-Cat II	0.0215				0.0285			
W.E., 5-Off, *n*-Cat III	0.0155				0.0206			
W.E., 5-Off, *n*-Cat IV	0.0108				0.0143			
W.E., 5-Off, *n*-Cat V	0.0091				0.0121			
W.E., 5-Off, *n*-Cat VI	0.0091				0.0121			
W.E., 6-Off, *n*-Cat I	0.0666				0.0884			
W.E., 6-Off, *n*-Cat II	0.0215				0.0285			
W.E., 6-Off, *n*-Cat III	0.0155				0.0206			
W.E., 6-Off, *n*-Cat IV	0.0108				0.0143			
W.E., 6-Off, *n*-Cat V	0.0091				0.0121			
W.E., 6-Off, *n*-Cat VI	0.0091				0.0121			
W.E., 4-Off, *n*-Cat I	0.0814				0.1080			
W.E., 4-Off, *n*-Cat II	0.0215				0.0285			
W.E., 4-Off, *n*-Cat III	0.0155				0.0206			
W.E., 4-Off, *n*-Cat IV	0.0108				0.0143			
W.E., 4-Off, *n*-Cat V	0.0091				0.0121			
W.E., 4-Off, *n*-Cat VI	0.0091				0.0121			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

Criteria	What-If Scenario VI — What Changed? *All Distance-Related PV Weights Reduced 20% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority	What-If Scenario VII — What Changed? *All Distance-Related PV Weights Reduced 50% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority
$C_{Rn\text{-}222}$	0.0123	1st	Loc. 1-Off	0.1143	0.0130	1st	Loc. 1-Off	0.1142
Distance, LTP	0.1046	2nd	Loc. 16	0.0962	0.0689	2nd	Loc. 4	0.0969
Distance, 5-Off	0.0116	3rd	Loc. 4	0.0950	0.0077	3rd	Loc. 16	0.0944
Distance, 6-Off	0.0116	4th	Loc. 3-Off	0.0936	0.0077	4th	Loc. 5	0.0906
Distance, 4-Off	0.0098	5th	Loc. 5	0.0886	0.0065	5th	Loc. 6	0.0903
Elevation	0.1307	6th	Loc. 6	0.0883	0.1378	6th	Loc. 3-Off	0.0865
W.E., LTP, *n*-Cat I	0.0734	7th	Loc. 2-Off	0.0848	0.0774	7th	Loc. 7	0.0830
W.E., LTP, *n*-Cat II	0.0290	8th	Loc. 7	0.0816	0.0306	8th	Loc. 2-Off	0.0806
W.E., LTP, *n*-Cat III	0.0209	9th	Loc. 2	0.0698	0.0221	9th	Loc. 2	0.0716
W.E., LTP, *n*-Cat IV	0.0145	10th	Loc. 1A	0.0656	0.0153	10th	Loc. 1A	0.0673
W.E., LTP, *n*-Cat V	0.0123	11th	Loc. 3	0.0649	0.0130	11th	Loc. 3	0.0662
W.E., LTP, *n*-Cat VI	0.0123	12th	Loc. 1	0.0572	0.0130	12th	Loc. 1	0.0584
W.E., 5-Off, *n*-Cat I	0.0899				0.0948			
W.E., 5-Off, *n*-Cat II	0.0290				0.0306			
W.E., 5-Off, *n*-Cat III	0.0209				0.0221			
W.E., 5-Off, *n*-Cat IV	0.0145				0.0153			
W.E., 5-Off, *n*-Cat V	0.0123				0.0130			
W.E., 5-Off, *n*-Cat VI	0.0123				0.0130			
W.E., 6-Off, *n*-Cat I	0.0899				0.0948			
W.E., 6-Off, *n*-Cat II	0.0290				0.0306			
W.E., 6-Off, *n*-Cat III	0.0209				0.0221			
W.E., 6-Off, *n*-Cat IV	0.0145				0.0153			
W.E., 6-Off, *n*-Cat V	0.0123				0.0130			
W.E., 6-Off, *n*-Cat VI	0.0123				0.0130			
W.E., 4-Off, *n*-Cat I	0.1098				0.1158			
W.E., 4-Off, *n*-Cat II	0.0290				0.0306			
W.E., 4-Off, *n*-Cat III	0.0209				0.0221			
W.E., 4-Off, *n*-Cat IV	0.0145				0.0153			
W.E., 4-Off, *n*-Cat V	0.0123				0.0130			
W.E., 4-Off, *n*-Cat VI	0.0123				0.0130			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? *Elevation PV Weights Reduced 10% from Original "As-Is" Values.*				**What Changed? *Elevation PV Weights Reduced 20% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0120	1st	Loc. 1-Off	0.1107	0.0122	1st	Loc. 1-Off	0.1069
Distance, LTP	0.1280	2nd	Loc. 3-Off	0.0983	0.1296	2nd	Loc. 3-Off	0.0986
Distance, 5-Off	0.0142	3rd	Loc. 16	0.0978	0.0144	3rd	Loc. 16	0.0982
Distance, 6-Off	0.0142	4th	Loc. 4	0.0945	0.0144	4th	Loc. 4	0.0951
Distance, 4-Off	0.0120	5th	Loc. 5	0.0879	0.0122	5th	Loc. 5	0.0885
Elevation	0.1152	6th	Loc. 2-Off	0.0877	0.1037	6th	Loc. 2-Off	0.0882
W.E., LTP, *n*-Cat I	0.0719	7th	Loc. 6	0.0875	0.0728	7th	Loc. 6	0.0880
W.E., LTP, *n*-Cat II	0.0284	8th	Loc. 7	0.0810	0.0287	8th	Loc. 7	0.0814
W.E., LTP, *n*-Cat III	0.0205	9th	Loc. 2	0.0691	0.0208	9th	Loc. 2	0.0695
W.E., LTP, *n*-Cat IV	0.0142	10th	Loc. 1A	0.0648	0.0144	10th	Loc. 1A	0.0650
W.E., LTP, *n*-Cat V	0.0120	11th	Loc. 3	0.0640	0.0122	11th	Loc. 3	0.0638
W.E., LTP, *n*-Cat VI	0.0120	12th	Loc. 1	0.0566	0.0122	12th	Loc. 1	0.0568
W.E., 5-Off, *n*-Cat I	0.0881				0.0892			
W.E., 5-Off, *n*-Cat II	0.0284				0.0287			
W.E., 5-Off, *n*-Cat III	0.0205				0.0208			
W.E., 5-Off, *n*-Cat IV	0.0142				0.0144			
W.E., 5-Off, *n*-Cat V	0.0120				0.0122			
W.E., 5-Off, *n*-Cat VI	0.0120				0.0122			
W.E., 6-Off, *n*-Cat I	0.0881				0.0892			
W.E., 6-Off, *n*-Cat II	0.0284				0.0287			
W.E., 6-Off, *n*-Cat III	0.0205				0.0208			
W.E., 6-Off, *n*-Cat IV	0.0142				0.0144			
W.E., 6-Off, *n*-Cat V	0.0120				0.0122			
W.E., 6-Off, *n*-Cat VI	0.0120				0.0122			
W.E., 4-Off, *n*-Cat I	0.1075				0.1089			
W.E., 4-Off, *n*-Cat II	0.0284				0.0287			
W.E., 4-Off, *n*-Cat III	0.0205				0.0208			
W.E., 4-Off, *n*-Cat IV	0.0142				0.0144			
W.E., 4-Off, *n*-Cat V	0.0120				0.0122			
W.E., 4-Off, *n*-Cat VI	0.0120				0.0122			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	What-If Scenario X				**What-If Scenario XI**			
	What Changed? ***Elevation PV Weights Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***Measured $C_{Rn\text{-}222}$ PV Weights Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0127	1st	Loc. 16	0.0997	0.0107	1st	Loc. 1-Off	0.1144
Distance, LTP	0.1349	2nd	Loc. 3-Off	0.0996	0.1265	2nd	Loc. 3-Off	0.0980
Distance, 5-Off	0.0150	3rd	Loc. 4	0.0970	0.0141	3rd	Loc. 16	0.0974
Distance, 6-Off	0.0150	4th	Loc. 1-Off	0.0952	0.0141	4th	Loc. 4	0.0939
Distance, 4-Off	0.0127	5th	Loc. 5	0.0902	0.0119	5th	Loc. 5	0.0874
Elevation	0.0674	6th	Loc. 6	0.0896	0.1265	6th	Loc. 2-Off	0.0873
W.E., LTP, *n*-Cat I	0.0757	7th	Loc. 2-Off	0.0896	0.0710	7th	Loc. 6	0.0871
W.E., LTP, *n*-Cat II	0.0299	8th	Loc. 7	0.0825	0.0281	8th	Loc. 7	0.0807
W.E., LTP, *n*-Cat III	0.0216	9th	Loc. 2	0.0708	0.0203	9th	Loc. 2	0.0687
W.E., LTP, *n*-Cat IV	0.0150	10th	Loc. 1A	0.0656	0.0141	10th	Loc. 3	0.0643
W.E., LTP, *n*-Cat V	0.0127	11th	Loc. 3	0.0630	0.0119	11th	Loc. 1A	0.0642
W.E., LTP, *n*-Cat VI	0.0127	12th	Loc. 1	0.0573	0.0119	12th	Loc. 1	0.0565
W.E., 5-Off, *n*-Cat I	0.0928				0.0871			
W.E., 5-Off, *n*-Cat II	0.0299				0.0281			
W.E., 5-Off, *n*-Cat III	0.0216				0.0203			
W.E., 5-Off, *n*-Cat IV	0.0150				0.0141			
W.E., 5-Off, *n*-Cat V	0.0127				0.0119			
W.E., 5-Off, *n*-Cat VI	0.0127				0.0119			
W.E., 6-Off, *n*-Cat I	0.0928				0.0871			
W.E., 6-Off, *n*-Cat II	0.0299				0.0281			
W.E., 6-Off, *n*-Cat III	0.0216				0.0203			
W.E., 6-Off, *n*-Cat IV	0.0150				0.0141			
W.E., 6-Off, *n*-Cat V	0.0127				0.0119			
W.E., 6-Off, *n*-Cat VI	0.0127				0.0119			
W.E., 4-Off, *n*-Cat I	0.1133				0.1063			
W.E., 4-Off, *n*-Cat II	0.0299				0.0281			
W.E., 4-Off, *n*-Cat III	0.0216				0.0203			
W.E., 4-Off, *n*-Cat IV	0.0150				0.0141			
W.E., 4-Off, *n*-Cat V	0.0127				0.0119			
W.E., 4-Off, *n*-Cat VI	0.0127				0.0119			

Table 268 (Cont'd). Sensitivity Analysis for 1st AHP-Style Analysis (Iterative Approach).

	What-If Scenario XII				What-If Scenario XIII			
	What Changed? *Measured C_{Rn-222} PV Weights Reduced 20% from Original "As-Is" Values.*				What Changed? *Measured C_{Rn-222} PV Weights Reduced 50% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
C_{Rn-222}	0.0095	1st	Loc. 1-Off	0.1144	0.0060	1st	Loc. 1-Off	0.1146
Distance, LTP	0.1266	2nd	Loc. 3-Off	0.0981	0.1271	2nd	Loc. 3-Off	0.0982
Distance, 5-Off	0.0141	3rd	Loc. 16	0.0975	0.0141	3rd	Loc. 16	0.0976
Distance, 6-Off	0.0141	4th	Loc. 4	0.0939	0.0141	4th	Loc. 4	0.0940
Distance, 4-Off	0.0119	5th	Loc. 5	0.0875	0.0120	5th	Loc. 5	0.0876
Elevation	0.1266	6th	Loc. 2-Off	0.0874	0.1271	6th	Loc. 2-Off	0.0875
W.E., LTP, *n*-Cat I	0.0711	7th	Loc. 6	0.0872	0.0714	7th	Loc. 6	0.0874
W.E., LTP, *n*-Cat II	0.0281	8th	Loc. 7	0.0808	0.0282	8th	Loc. 7	0.0809
W.E., LTP, *n*-Cat III	0.0203	9th	Loc. 2	0.0688	0.0204	9th	Loc. 2	0.0688
W.E., LTP, *n*-Cat IV	0.0141	10th	Loc. 3	0.0643	0.0141	10th	Loc. 3	0.0644
W.E., LTP, *n*-Cat V	0.0119	11th	Loc. 1A	0.0638	0.0120	11th	Loc. 1A	0.0625
W.E., LTP, *n*-Cat VI	0.0119	12th	Loc. 1	0.0565	0.0120	12th	Loc. 1	0.0565
W.E., 5-Off, *n*-Cat I	0.0872				0.0875			
W.E., 5-Off, *n*-Cat II	0.0281				0.0282			
W.E., 5-Off, *n*-Cat III	0.0203				0.0204			
W.E., 5-Off, *n*-Cat IV	0.0141				0.0141			
W.E., 5-Off, *n*-Cat V	0.0119				0.0120			
W.E., 5-Off, *n*-Cat VI	0.0119				0.0120			
W.E., 6-Off, *n*-Cat I	0.0872				0.0875			
W.E., 6-Off, *n*-Cat II	0.0281				0.0282			
W.E., 6-Off, *n*-Cat III	0.0203				0.0204			
W.E., 6-Off, *n*-Cat IV	0.0141				0.0141			
W.E., 6-Off, *n*-Cat V	0.0119				0.0120			
W.E., 6-Off, *n*-Cat VI	0.0119				0.0120			
W.E., 4-Off, *n*-Cat I	0.1064				0.1068			
W.E., 4-Off, *n*-Cat II	0.0281				0.0282			
W.E., 4-Off, *n*-Cat III	0.0203				0.0204			
W.E., 4-Off, *n*-Cat IV	0.0141				0.0141			
W.E., 4-Off, *n*-Cat V	0.0119				0.0120			
W.E., 4-Off, *n*-Cat VI	0.0119				0.0120			

The sensitivity analysis above reveals Locations 1-Off and 3-Off to be highly ranked across nearly all what-if scenarios. Similarly, Locations 1 and 1A are the least preferred alternatives for each variation. The sensitivity analysis indicates the outcomes of the AHP-style pairwise comparison are resistant to changes in the weighting PV values.

As indicated in Tables Table ***267*** and Table ***268***, the AHP-Style analysis exercise has shown Location 1-Off to be the decision problem alternative with the highest global priority. However, before moving forward with the Iterative Approach process, a few things must be addressed. First, in scrutinizing Table 266, it can be seen that the tolerable limit of 0.20 has been violated. As discussed in

CHAPTER 2, for small matrices (where $n < 9$), the maximum acceptable CR is 0.10; for larger matrices (where $n > 9$), it is expected that consistencies may be greater. Nonetheless, the maximum *tolerable* limit as provided by several of Saaty's works is given as 0.20. The CR calculated in Table 266 is shown as 0.2617; thus, since the matrix under study is relatively large (*i.e., n* = 30), a higher degree of inconsistency was expected, but a CR value greater than 0.20 is still intolerable. Accordingly, even though the inputs that feed the entries were directly derived from the weighting factors of the initial MAUT analysis, the AHP protocols that underlie the Iterative Approach require that efforts be taken to re-evaluate these entries so as to achieve a CR within tolerance before cycling (*i.e.,* iterating) the focus back to the MAUT analysis.

In an attempt to bring the CR down, the input values to the pairwise comparison (*i.e.,* the MAUT weighting values) were re-assessed. While there may be a range of values that could be selected that would keep the general preferences the same and maintain independence between the hybrid approaches, in the interests of comparison, the same weighting values chosen during the Validation Approach have been used. Since this, on the surface of things may appear to be a conflict in terms of the precepts established for this dissertation, a brief explanation is offered next.

As a preface to this explanation, it should be pointed out that the *initial* MAUT values (*i.e.,* the weighting values and MU values used in the initial MAUT) were used to create the AHP-style pairwise comparisons. When the initial MAUT weighting values were plugged into the 30 by 30 pairwise comparison matrix, they produced a set of PVs that were then used in the AHP-style model synthesis, and even though the CR was intolerable, the result is glaringly difficult to miss: Location 1 revealed itself to be the most rational choice, which is the same result achieved by the *initial* AHP and ANP analyses and, later, the *re-evaluated* MAUT that was required by the Validation Approach.

The precepts of this dissertation that are meant to govern the independence of the hybrid approaches are more granularly explained as follows. The idea was to assume that a decision-maker analyzing a decision problem would have an assortment of MCDM techniques from which to choose; it would not be typical for a decision-maker to analyze a given decision problem using multiple MCDM techniques. In practical applications, a decision-maker would typically choose one MCDM technique, analyze the decision problem, and report the results. With this in mind, and in terms of the *academically recognized* MCDM techniques (*i.e.,* MAUT, AHP, and ANP) followed by the hybrid approaches (*i.e.,* the Validation, Iterative, and ANP-weighting approaches) presented in this dissertation, just as much was assumed. That is to say, it was assumed that in any practical situation, a decision-maker would only pursue one method, and therefore, would not have any outside or otherwise prior knowledge of having [hypothetically] run alternative MCDM models. This brings the point to a closing argument, in that, if the starting point is a metaphorical blank slate, then the integrity of the independence precepts is held, so long as no knowledge is used that might have otherwise been gleaned from one of the other MCDM methods.

For the situation at hand with the Iterative Approach (*i.e.,* using the same [re-evaluated] MAUT weighting values that were used in the Validation Approach, the independence precepts were not violated because it is reasonable to assume that a decision-maker, starting with the initial MAUT analysis and having no knowledge of any prior attempts to analyze the decision problem, would be compelled to revise the MAUT weighting values after having performed the AHP-style analysis prescribed by the Iterative Approach.

Finally, as alluded to earlier, there would conceivably be a range of values that could be used to bring the CR down to tolerable levels. In practice, requirement for this *range of values* would merely be to establish any set of values that would preserve the general preferences of the alternatives. For example, if the original value for *x* was preferred to the original value for *y*, then any revision should preserve this preference, but the *degree* of preference would be fair game to modify.

Tables Table ***264*** through Table ***268*** have been revised using the Re-Evaluated MAUT Weighting Factors found in Table 168. The results can be reviewed in the following tables, which are introduced as follows:

- Tables Table ***270***, Table ***271***, and Table ***272*** depict the pairwise comparison of the re-evaluated MAUT weighting values, the derivation of PVs from that pairwise comparison, and the consistency check for the pairwise comparison, respectively.
- Table 273 depicts the revised synthesized model for the Iterative Approach's AHP-style analysis using the *new* PVs obtained from Table 271.
- Table 274 presents a summarized listing of the results of the revised synthesized model for the Iterative Approach's AHP-style analysis.

Table 270. Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		Measured $C_{Rn\text{-}222}$	**Distance from LTP**	**Distance from 5-Off**	**Distance from 6-Off**
	Normalized Values	1.0000	10.0000	2.0000	2.0000
Meas. $C_{Rn\text{-}222}$	1.0000	1.0000	0.1111	1.0000	1.0000
Distance, LTP	10.0000	9.0000	1.0000	8.0000	8.0000
Distance, 5-Off	2.0000	1.0000	0.1250	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	0.1250	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	0.1111	1.0000	1.0000
Elevation	10.0000	9.0000	1.0000	8.0000	8.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	0.2500	4.0000	4.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	0.3333	5.0000	5.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	0.3333	5.0000	5.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	0.5000	6.0000	6.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	0.1111	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	0.1111	1.0000	1.0000
Sum	1.0000	66.0000	6.1111	60.0000	60.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		Distance from 4-Off	**Elevation**	**W.E., LTP, *n*-Cat I**	**W.E., LTP, *n*-Cat II**
	Normalized Values	1.0000	10.0000	6.0000	1.0000
C_{Rn-222}	1.0000	1.0000	0.1111	0.2000	1.0000
Distance, LTP	10.0000	9.0000	1.0000	4.0000	9.0000
Distance, 5-Off	2.0000	1.0000	0.1250	0.2500	1.0000
Distance, 6-Off	2.0000	1.0000	0.1250	0.2500	1.0000
Distance, 4-Off	1.0000	1.0000	0.1111	0.2000	1.0000
Elevation	10.0000	9.0000	1.0000	4.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	0.2500	1.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	0.3333	1.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	0.3333	1.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	0.5000	2.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	0.1111	0.2000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	0.1111	0.2000	1.0000
Sum		66.0000	6.1111	17.9000	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., LTP, *n*-Cat III	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**
	Normalized Values	1.0000	1.0000	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	1.0000	1.0000	1.0000
Distance, LTP	10.0000	9.0000	9.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	1.0000	1.0000	1.0000
Elevation	10.0000	9.0000	9.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	5.0000	5.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	6.0000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	6.0000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	7.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
Sum		66.0000	66.0000	66.0000	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., 5-Off, *n*-Cat I	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**
	Normalized Values	7.0000	1.0000	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	0.1667	1.0000	1.0000	1.0000
Distance, LTP	10.0000	3.0000	9.0000	9.0000	9.0000
Distance, 5-Off	2.0000	0.2000	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	0.2000	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	0.1667	1.0000	1.0000	1.0000
Elevation	10.0000	3.0000	9.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	1.0000	5.0000	5.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	1.0000	6.0000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	1.0000	6.0000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	1.0000	7.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1667	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1667	1.0000	1.0000	1.0000
Sum		14.0667	66.0000	66.0000	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., 5-Off, *n*-Cat V	**W.E., 5-Off, *n*-Cat VI**	**W.E., 6-Off, *n*-Cat I**	**W.E., 6-Off, *n*-Cat II**
	Normalized Values	1.0000	1.0000	7.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	1.0000	0.1667	1.0000
Distance, LTP	10.0000	9.0000	9.0000	3.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000	0.2000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000	0.2000	1.0000
Distance, 4-Off	1.0000	1.0000	1.0000	0.1667	1.0000
Elevation	10.0000	9.0000	9.0000	3.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	5.0000	1.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	6.0000	1.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	6.0000	1.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	7.0000	1.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1667	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1667	1.0000
Sum		66.0000	66.0000	14.0667	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., 6-Off, *n*-Cat III	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**
	Normalized Values	1.0000	1.0000	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	1.0000	1.0000	1.0000	1.0000
Distance, LTP	10.0000	9.0000	9.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	1.0000	1.0000	1.0000
Elevation	10.0000	9.0000	9.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	5.0000	5.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	6.0000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	6.0000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	7.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
Sum		66.0000	66.0000	66.0000	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., 4-Off, *n*-Cat I	W.E., 4-Off, *n*-Cat II	W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV
	Normalized Values	8.0000	1.0000	1.0000	1.0000
$C_{Rn\text{-}222}$	1.0000	0.1429	1.0000	1.0000	1.0000
Distance, LTP	10.0000	2.0000	9.0000	9.0000	9.0000
Distance, 5-Off	2.0000	0.1667	1.0000	1.0000	1.0000
Distance, 6-Off	2.0000	0.1667	1.0000	1.0000	1.0000
Distance, 4-Off	1.0000	0.1429	1.0000	1.0000	1.0000
Elevation	10.0000	2.0000	9.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	0.5000	5.0000	5.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	1.0000	6.0000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	1.0000	6.0000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	1.0000	7.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1429	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1429	1.0000	1.0000	1.0000
Sum		10.9762	66.0000	66.0000	66.0000

Table 269 (Cont'd). Iterative Approach: Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

		W.E., 4-Off, *n*-Cat V	**W.E., 4-Off, *n*-Cat VI**
	Normalized Values	1.0000	1.0000
C_{Rn-222}	1.0000	1.0000	1.0000
Distance, LTP	10.0000	9.0000	9.0000
Distance, 5-Off	2.0000	1.0000	1.0000
Distance, 6-Off	2.0000	1.0000	1.0000
Distance, 4-Off	1.0000	1.0000	1.0000
Elevation	10.0000	9.0000	9.0000
W.E., LTP, *n*-Cat I	6.0000	5.0000	5.0000
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	7.0000	6.0000	6.0000
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	7.0000	6.0000	6.0000
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	8.0000	7.0000	7.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000
Sum		66.0000	66.0000

Table 271. Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	Measured $C_{Rn\text{-}222}$	**Distance from LTP**	**Distance from 5-Off**	**Distance from 6-Off**
$C_{Rn\text{-}222}$	0.0152	0.0182	0.0167	0.0167
Distance, LTP	0.1364	0.1636	0.1333	0.1333
Distance, 5-Off	0.0152	0.0205	0.0167	0.0167
Distance, 6-Off	0.0152	0.0205	0.0167	0.0167
Distance, 4-Off	0.0152	0.0182	0.0167	0.0167
Elevation	0.1364	0.1636	0.1333	0.1333
W.E., LTP, *n*-Cat I	0.0758	0.0409	0.0667	0.0667
W.E., LTP, *n*-Cat II	0.0152	0.0182	0.0167	0.0167
W.E., LTP, *n*-Cat III	0.0152	0.0182	0.0167	0.0167
W.E., LTP, *n*-Cat IV	0.0152	0.0182	0.0167	0.0167
W.E., LTP, *n*-Cat V	0.0152	0.0182	0.0167	0.0167
W.E., LTP, *n*-Cat VI	0.0152	0.0182	0.0167	0.0167
W.E., 5-Off, *n*-Cat I	0.0909	0.0545	0.0833	0.0833
W.E., 5-Off, *n*-Cat II	0.0152	0.0182	0.0167	0.0167
W.E., 5-Off, *n*-Cat III	0.0152	0.0182	0.0167	0.0167
W.E., 5-Off, *n*-Cat IV	0.0152	0.0182	0.0167	0.0167
W.E., 5-Off, *n*-Cat V	0.0152	0.0182	0.0167	0.0167
W.E., 5-Off, *n*-Cat VI	0.0152	0.0182	0.0167	0.0167
W.E., 6-Off, *n*-Cat I	0.0909	0.0545	0.0833	0.0833
W.E., 6-Off, *n*-Cat II	0.0152	0.0182	0.0167	0.0167
W.E., 6-Off, *n*-Cat III	0.0152	0.0182	0.0167	0.0167
W.E., 6-Off, *n*-Cat IV	0.0152	0.0182	0.0167	0.0167
W.E., 6-Off, *n*-Cat V	0.0152	0.0182	0.0167	0.0167
W.E., 6-Off, *n*-Cat VI	0.0152	0.0182	0.0167	0.0167
W.E., 4-Off, *n*-Cat I	0.1061	0.0818	0.1000	0.1000
W.E., 4-Off, *n*-Cat II	0.0152	0.0182	0.0167	0.0167
W.E., 4-Off, *n*-Cat III	0.0152	0.0182	0.0167	0.0167
W.E., 4-Off, *n*-Cat IV	0.0152	0.0182	0.0167	0.0167
W.E., 4-Off, *n*-Cat V	0.0152	0.0182	0.0167	0.0167
W.E., 4-Off, *n*-Cat VI	0.0152	0.0182	0.0167	0.0167

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	Distance from 4-Off	Elevation	W.E., LTP, *n*-Cat I	W.E., LTP, *n*-Cat II
$C_{Rn\text{-}222}$	0.0152	0.0182	0.0112	0.0152
Distance, LTP	0.1364	0.1636	0.2235	0.1364
Distance, 5-Off	0.0152	0.0205	0.0140	0.0152
Distance, 6-Off	0.0152	0.0205	0.0140	0.0152
Distance, 4-Off	0.0152	0.0182	0.0112	0.0152
Elevation	0.1364	0.1636	0.2235	0.1364
W.E., LTP, *n*-Cat I	0.0758	0.0409	0.0559	0.0758
W.E., LTP, *n*-Cat II	0.0152	0.0182	0.0112	0.0152
W.E., LTP, *n*-Cat III	0.0152	0.0182	0.0112	0.0152
W.E., LTP, *n*-Cat IV	0.0152	0.0182	0.0112	0.0152
W.E., LTP, *n*-Cat V	0.0152	0.0182	0.0112	0.0152
W.E., LTP, *n*-Cat VI	0.0152	0.0182	0.0112	0.0152
W.E., 5-Off, *n*-Cat I	0.0909	0.0545	0.0559	0.0909
W.E., 5-Off, *n*-Cat II	0.0152	0.0182	0.0112	0.0152
W.E., 5-Off, *n*-Cat III	0.0152	0.0182	0.0112	0.0152
W.E., 5-Off, *n*-Cat IV	0.0152	0.0182	0.0112	0.0152
W.E., 5-Off, *n*-Cat V	0.0152	0.0182	0.0112	0.0152
W.E., 5-Off, *n*-Cat VI	0.0152	0.0182	0.0112	0.0152
W.E., 6-Off, *n*-Cat I	0.0909	0.0545	0.0559	0.0909
W.E., 6-Off, *n*-Cat II	0.0152	0.0182	0.0112	0.0152
W.E., 6-Off, *n*-Cat III	0.0152	0.0182	0.0112	0.0152
W.E., 6-Off, *n*-Cat IV	0.0152	0.0182	0.0112	0.0152
W.E., 6-Off, *n*-Cat V	0.0152	0.0182	0.0112	0.0152
W.E., 6-Off, *n*-Cat VI	0.0152	0.0182	0.0112	0.0152
W.E., 4-Off, *n*-Cat I	0.1061	0.0818	0.1117	0.1061
W.E., 4-Off, *n*-Cat II	0.0152	0.0182	0.0112	0.0152
W.E., 4-Off, *n*-Cat III	0.0152	0.0182	0.0112	0.0152
W.E., 4-Off, *n*-Cat IV	0.0152	0.0182	0.0112	0.0152
W.E., 4-Off, *n*-Cat V	0.0152	0.0182	0.0112	0.0152
W.E., 4-Off, *n*-Cat VI	0.0152	0.0182	0.0112	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., LTP, *n*-Cat III	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**
$C_{Rn\text{-}222}$	0.0152	0.0152	0.0152	0.0152
Distance, LTP	0.1364	0.1364	0.1364	0.1364
Distance, 5-Off	0.0152	0.0152	0.0152	0.0152
Distance, 6-Off	0.0152	0.0152	0.0152	0.0152
Distance, 4-Off	0.0152	0.0152	0.0152	0.0152
Elevation	0.1364	0.1364	0.1364	0.1364
W.E., LTP, *n*-Cat I	0.0758	0.0758	0.0758	0.0758
W.E., LTP, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat I	0.0909	0.0909	0.0909	0.0909
W.E., 5-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat I	0.0909	0.0909	0.0909	0.0909
W.E., 6-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat I	0.1061	0.1061	0.1061	0.1061
W.E., 4-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., 5-Off, *n*-Cat I	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**
$C_{Rn\text{-}222}$	0.0118	0.0152	0.0152	0.0152
Distance, LTP	0.2133	0.1364	0.1364	0.1364
Distance, 5-Off	0.0142	0.0152	0.0152	0.0152
Distance, 6-Off	0.0142	0.0152	0.0152	0.0152
Distance, 4-Off	0.0118	0.0152	0.0152	0.0152
Elevation	0.2133	0.1364	0.1364	0.1364
W.E., LTP, *n*-Cat I	0.0711	0.0758	0.0758	0.0758
W.E., LTP, *n*-Cat II	0.0118	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat III	0.0118	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat IV	0.0118	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat V	0.0118	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat VI	0.0118	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat I	0.0711	0.0909	0.0909	0.0909
W.E., 5-Off, *n*-Cat II	0.0118	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat III	0.0118	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat IV	0.0118	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat V	0.0118	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat VI	0.0118	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat I	0.0711	0.0909	0.0909	0.0909
W.E., 6-Off, *n*-Cat II	0.0118	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat III	0.0118	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat IV	0.0118	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat V	0.0118	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat VI	0.0118	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat I	0.0711	0.1061	0.1061	0.1061
W.E., 4-Off, *n*-Cat II	0.0118	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat III	0.0118	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat IV	0.0118	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat V	0.0118	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat VI	0.0118	0.0152	0.0152	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., 5-Off, *n*-Cat V	**W.E., 5-Off, *n*-Cat VI**	**W.E., 6-Off, *n*-Cat I**	**W.E., 6-Off, *n*-Cat II**
$C_{Rn\text{-}222}$	0.0152	0.0152	0.0118	0.0152
Distance, LTP	0.1364	0.1364	0.2133	0.1364
Distance, 5-Off	0.0152	0.0152	0.0142	0.0152
Distance, 6-Off	0.0152	0.0152	0.0142	0.0152
Distance, 4-Off	0.0152	0.0152	0.0118	0.0152
Elevation	0.1364	0.1364	0.2133	0.1364
W.E., LTP, *n*-Cat I	0.0758	0.0758	0.0711	0.0758
W.E., LTP, *n*-Cat II	0.0152	0.0152	0.0118	0.0152
W.E., LTP, *n*-Cat III	0.0152	0.0152	0.0118	0.0152
W.E., LTP, *n*-Cat IV	0.0152	0.0152	0.0118	0.0152
W.E., LTP, *n*-Cat V	0.0152	0.0152	0.0118	0.0152
W.E., LTP, *n*-Cat VI	0.0152	0.0152	0.0118	0.0152
W.E., 5-Off, *n*-Cat I	0.0909	0.0909	0.0711	0.0909
W.E., 5-Off, *n*-Cat II	0.0152	0.0152	0.0118	0.0152
W.E., 5-Off, *n*-Cat III	0.0152	0.0152	0.0118	0.0152
W.E., 5-Off, *n*-Cat IV	0.0152	0.0152	0.0118	0.0152
W.E., 5-Off, *n*-Cat V	0.0152	0.0152	0.0118	0.0152
W.E., 5-Off, *n*-Cat VI	0.0152	0.0152	0.0118	0.0152
W.E., 6-Off, *n*-Cat I	0.0909	0.0909	0.0711	0.0909
W.E., 6-Off, *n*-Cat II	0.0152	0.0152	0.0118	0.0152
W.E., 6-Off, *n*-Cat III	0.0152	0.0152	0.0118	0.0152
W.E., 6-Off, *n*-Cat IV	0.0152	0.0152	0.0118	0.0152
W.E., 6-Off, *n*-Cat V	0.0152	0.0152	0.0118	0.0152
W.E., 6-Off, *n*-Cat VI	0.0152	0.0152	0.0118	0.0152
W.E., 4-Off, *n*-Cat I	0.1061	0.1061	0.0711	0.1061
W.E., 4-Off, *n*-Cat II	0.0152	0.0152	0.0118	0.0152
W.E., 4-Off, *n*-Cat III	0.0152	0.0152	0.0118	0.0152
W.E., 4-Off, *n*-Cat IV	0.0152	0.0152	0.0118	0.0152
W.E., 4-Off, *n*-Cat V	0.0152	0.0152	0.0118	0.0152
W.E., 4-Off, *n*-Cat VI	0.0152	0.0152	0.0118	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., 6-Off, *n*-Cat III	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**
$C_{\mathrm{Rn\text{-}222}}$	0.0152	0.0152	0.0152	0.0152
Distance, LTP	0.1364	0.1364	0.1364	0.1364
Distance, 5-Off	0.0152	0.0152	0.0152	0.0152
Distance, 6-Off	0.0152	0.0152	0.0152	0.0152
Distance, 4-Off	0.0152	0.0152	0.0152	0.0152
Elevation	0.1364	0.1364	0.1364	0.1364
W.E., LTP, *n*-Cat I	0.0758	0.0758	0.0758	0.0758
W.E., LTP, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat I	0.0909	0.0909	0.0909	0.0909
W.E., 5-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat I	0.0909	0.0909	0.0909	0.0909
W.E., 6-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat I	0.1061	0.1061	0.1061	0.1061
W.E., 4-Off, *n*-Cat II	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat III	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat IV	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat V	0.0152	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat VI	0.0152	0.0152	0.0152	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., 4-Off, *n*-Cat I	W.E., 4-Off, *n*-Cat II	W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV
$C_{Rn\text{-}222}$	0.0130	0.0152	0.0152	0.0152
Distance, LTP	0.1822	0.1364	0.1364	0.1364
Distance, 5-Off	0.0152	0.0152	0.0152	0.0152
Distance, 6-Off	0.0152	0.0152	0.0152	0.0152
Distance, 4-Off	0.0130	0.0152	0.0152	0.0152
Elevation	0.1822	0.1364	0.1364	0.1364
W.E., LTP, *n*-Cat I	0.0456	0.0758	0.0758	0.0758
W.E., LTP, *n*-Cat II	0.0130	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat III	0.0130	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat IV	0.0130	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat V	0.0130	0.0152	0.0152	0.0152
W.E., LTP, *n*-Cat VI	0.0130	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat I	0.0911	0.0909	0.0909	0.0909
W.E., 5-Off, *n*-Cat II	0.0130	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat III	0.0130	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat IV	0.0130	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat V	0.0130	0.0152	0.0152	0.0152
W.E., 5-Off, *n*-Cat VI	0.0130	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat I	0.0911	0.0909	0.0909	0.0909
W.E., 6-Off, *n*-Cat II	0.0130	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat III	0.0130	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat IV	0.0130	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat V	0.0130	0.0152	0.0152	0.0152
W.E., 6-Off, *n*-Cat VI	0.0130	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat I	0.0911	0.1061	0.1061	0.1061
W.E., 4-Off, *n*-Cat II	0.0130	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat III	0.0130	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat IV	0.0130	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat V	0.0130	0.0152	0.0152	0.0152
W.E., 4-Off, *n*-Cat VI	0.0130	0.0152	0.0152	0.0152

Table 270 (Cont'd). Iterative Approach: Derivation of PVs from Re-Evaluated MAUT Weighting Values.

	W.E., 4-Off, *n*-Cat V	W.E., 4-Off, *n*-Cat VI	Priority Vector
$C_{Rn\text{-}222}$	0.0152	0.0152	0.0150
Distance, LTP	0.1364	0.1364	0.1475
Distance, 5-Off	0.0152	0.0152	0.0155
Distance, 6-Off	0.0152	0.0152	0.0155
Distance, 4-Off	0.0152	0.0152	0.0150
Elevation	0.1364	0.1364	0.1475
W.E., LTP, *n*-Cat I	0.0758	0.0758	0.0708
W.E., LTP, *n*-Cat II	0.0152	0.0152	0.0150
W.E., LTP, *n*-Cat III	0.0152	0.0152	0.0150
W.E., LTP, *n*-Cat IV	0.0152	0.0152	0.0150
W.E., LTP, *n*-Cat V	0.0152	0.0152	0.0150
W.E., LTP, *n*-Cat VI	0.0152	0.0152	0.0150
W.E., 5-Off, *n*-Cat I	0.0909	0.0909	0.0855
W.E., 5-Off, *n*-Cat II	0.0152	0.0152	0.0150
W.E., 5-Off, *n*-Cat III	0.0152	0.0152	0.0150
W.E., 5-Off, *n*-Cat IV	0.0152	0.0152	0.0150
W.E., 5-Off, *n*-Cat V	0.0152	0.0152	0.0150
W.E., 5-Off, *n*-Cat VI	0.0152	0.0152	0.0150
W.E., 6-Off, *n*-Cat I	0.0909	0.0909	0.0855
W.E., 6-Off, *n*-Cat II	0.0152	0.0152	0.0150
W.E., 6-Off, *n*-Cat III	0.0152	0.0152	0.0150
W.E., 6-Off, *n*-Cat IV	0.0152	0.0152	0.0150
W.E., 6-Off, *n*-Cat V	0.0152	0.0152	0.0150
W.E., 6-Off, *n*-Cat VI	0.0152	0.0152	0.0150
W.E., 4-Off, *n*-Cat I	0.1061	0.1061	0.1014
W.E., 4-Off, *n*-Cat II	0.0152	0.0152	0.0150
W.E., 4-Off, *n*-Cat III	0.0152	0.0152	0.0150
W.E., 4-Off, *n*-Cat IV	0.0152	0.0152	0.0150
W.E., 4-Off, *n*-Cat V	0.0152	0.0152	0.0150
W.E., 4-Off, *n*-Cat VI	0.0152	0.0152	0.0150

Table 272. Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values.

	Measured $C_{Rn\text{-}222}$	**Distance from LTP**	**Distance from 5-Off**	**Distance from 6-Off**
Priority Vector	**0.0150**	**0.1475**	**0.0155**	**0.0155**
$C_{Rn\text{-}222}$	0.0150	0.0164	0.0155	0.0155
Distance, LTP	0.1353	0.1475	0.1240	0.1240
Distance, 5-Off	0.0150	0.0184	0.0155	0.0155
Distance, 6-Off	0.0150	0.0184	0.0155	0.0155
Distance, 4-Off	0.0150	0.0164	0.0155	0.0155
Elevation	0.1353	0.1475	0.1240	0.1240
W.E., LTP, *n*-Cat I	0.0752	0.0369	0.0620	0.0620
W.E., LTP, *n*-Cat II	0.0150	0.0164	0.0155	0.0155
W.E., LTP, *n*-Cat III	0.0150	0.0164	0.0155	0.0155
W.E., LTP, *n*-Cat IV	0.0150	0.0164	0.0155	0.0155
W.E., LTP, *n*-Cat V	0.0150	0.0164	0.0155	0.0155
W.E., LTP, *n*-Cat VI	0.0150	0.0164	0.0155	0.0155
W.E., 5-Off, *n*-Cat I	0.0902	0.0492	0.0775	0.0775
W.E., 5-Off, *n*-Cat II	0.0150	0.0164	0.0155	0.0155
W.E., 5-Off, *n*-Cat III	0.0150	0.0164	0.0155	0.0155
W.E., 5-Off, *n*-Cat IV	0.0150	0.0164	0.0155	0.0155
W.E., 5-Off, *n*-Cat V	0.0150	0.0164	0.0155	0.0155
W.E., 5-Off, *n*-Cat VI	0.0150	0.0164	0.0155	0.0155
W.E., 6-Off, *n*-Cat I	0.0902	0.0492	0.0775	0.0775
W.E., 6-Off, *n*-Cat II	0.0150	0.0164	0.0155	0.0155
W.E., 6-Off, *n*-Cat III	0.0150	0.0164	0.0155	0.0155
W.E., 6-Off, *n*-Cat IV	0.0150	0.0164	0.0155	0.0155
W.E., 6-Off, *n*-Cat V	0.0150	0.0164	0.0155	0.0155
W.E., 6-Off, *n*-Cat VI	0.0150	0.0164	0.0155	0.0155
W.E., 4-Off, *n*-Cat I	0.1052	0.0738	0.0930	0.0930
W.E., 4-Off, *n*-Cat II	0.0150	0.0164	0.0155	0.0155
W.E., 4-Off, *n*-Cat III	0.0150	0.0164	0.0155	0.0155
W.E., 4-Off, *n*-Cat IV	0.0150	0.0164	0.0155	0.0155
W.E., 4-Off, *n*-Cat V	0.0150	0.0164	0.0155	0.0155
W.E., 4-Off, *n*-Cat VI	0.0150	0.0164	0.0155	0.0155

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	Distance from 4-Off	Elevation	W.E., LTP, *n*-Cat I	W.E., LTP, *n*-Cat II
Priority Vector	**0.0150**	**0.1475**	**0.0708**	**0.0150**
$C_{Rn\text{-}222}$	0.0150	0.0164	0.0142	0.0150
Distance, LTP	0.1353	0.1475	0.2834	0.1353
Distance, 5-Off	0.0150	0.0184	0.0177	0.0150
Distance, 6-Off	0.0150	0.0184	0.0177	0.0150
Distance, 4-Off	0.0150	0.0164	0.0142	0.0150
Elevation	0.1353	0.1475	0.2834	0.1353
W.E., LTP, *n*-Cat I	0.0752	0.0369	0.0708	0.0752
W.E., LTP, *n*-Cat II	0.0150	0.0164	0.0142	0.0150
W.E., LTP, *n*-Cat III	0.0150	0.0164	0.0142	0.0150
W.E., LTP, *n*-Cat IV	0.0150	0.0164	0.0142	0.0150
W.E., LTP, *n*-Cat V	0.0150	0.0164	0.0142	0.0150
W.E., LTP, *n*-Cat VI	0.0150	0.0164	0.0142	0.0150
W.E., 5-Off, *n*-Cat I	0.0902	0.0492	0.0708	0.0902
W.E., 5-Off, *n*-Cat II	0.0150	0.0164	0.0142	0.0150
W.E., 5-Off, *n*-Cat III	0.0150	0.0164	0.0142	0.0150
W.E., 5-Off, *n*-Cat IV	0.0150	0.0164	0.0142	0.0150
W.E., 5-Off, *n*-Cat V	0.0150	0.0164	0.0142	0.0150
W.E., 5-Off, *n*-Cat VI	0.0150	0.0164	0.0142	0.0150
W.E., 6-Off, *n*-Cat I	0.0902	0.0492	0.0708	0.0902
W.E., 6-Off, *n*-Cat II	0.0150	0.0164	0.0142	0.0150
W.E., 6-Off, *n*-Cat III	0.0150	0.0164	0.0142	0.0150
W.E., 6-Off, *n*-Cat IV	0.0150	0.0164	0.0142	0.0150
W.E., 6-Off, *n*-Cat V	0.0150	0.0164	0.0142	0.0150
W.E., 6-Off, *n*-Cat VI	0.0150	0.0164	0.0142	0.0150
W.E., 4-Off, *n*-Cat I	0.1052	0.0738	0.1417	0.1052
W.E., 4-Off, *n*-Cat II	0.0150	0.0164	0.0142	0.0150
W.E., 4-Off, *n*-Cat III	0.0150	0.0164	0.0142	0.0150
W.E., 4-Off, *n*-Cat IV	0.0150	0.0164	0.0142	0.0150
W.E., 4-Off, *n*-Cat V	0.0150	0.0164	0.0142	0.0150
W.E., 4-Off, *n*-Cat VI	0.0150	0.0164	0.0142	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., LTP, *n*-Cat III	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**
Priority Vector	**0.0150**	**0.0150**	**0.0150**	**0.0150**
$C_{Rn\text{-}222}$	0.0150	0.0150	0.0150	0.0150
Distance, LTP	0.1353	0.1353	0.1353	0.1353
Distance, 5-Off	0.0150	0.0150	0.0150	0.0150
Distance, 6-Off	0.0150	0.0150	0.0150	0.0150
Distance, 4-Off	0.0150	0.0150	0.0150	0.0150
Elevation	0.1353	0.1353	0.1353	0.1353
W.E., LTP, *n*-Cat I	0.0752	0.0752	0.0752	0.0752
W.E., LTP, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat I	0.0902	0.0902	0.0902	0.0902
W.E., 5-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat I	0.0902	0.0902	0.0902	0.0902
W.E., 6-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat I	0.1052	0.1052	0.1052	0.1052
W.E., 4-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., 5-Off, *n*-Cat I	W.E., 5-Off, *n*-Cat II	W.E., 5-Off, *n*-Cat III	W.E., 5-Off, *n*-Cat IV
Priority Vector	**0.0855**	**0.0150**	**0.0150**	**0.0150**
$C_{Rn\text{-}222}$	0.0142	0.0150	0.0150	0.0150
Distance, LTP	0.2565	0.1353	0.1353	0.1353
Distance, 5-Off	0.0171	0.0150	0.0150	0.0150
Distance, 6-Off	0.0171	0.0150	0.0150	0.0150
Distance, 4-Off	0.0142	0.0150	0.0150	0.0150
Elevation	0.2565	0.1353	0.1353	0.1353
W.E., LTP, *n*-Cat I	0.0855	0.0752	0.0752	0.0752
W.E., LTP, *n*-Cat II	0.0142	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat III	0.0142	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat IV	0.0142	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat V	0.0142	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat VI	0.0142	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat I	0.0855	0.0902	0.0902	0.0902
W.E., 5-Off, *n*-Cat II	0.0142	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat III	0.0142	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat IV	0.0142	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat V	0.0142	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat VI	0.0142	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat I	0.0855	0.0902	0.0902	0.0902
W.E., 6-Off, *n*-Cat II	0.0142	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat III	0.0142	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat IV	0.0142	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat V	0.0142	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat VI	0.0142	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat I	0.0855	0.1052	0.1052	0.1052
W.E., 4-Off, *n*-Cat II	0.0142	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat III	0.0142	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat IV	0.0142	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat V	0.0142	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat VI	0.0142	0.0150	0.0150	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., 5-Off, *n*-Cat V	W.E., 5-Off, *n*-Cat VI	W.E., 6-Off, *n*-Cat I	W.E., 6-Off, *n*-Cat II
Priority Vector	**0.0150**	**0.0150**	**0.0855**	**0.0150**
$C_{Rn\text{-}222}$	0.0150	0.0150	0.0142	0.0150
Distance, LTP	0.1353	0.1353	0.2565	0.1353
Distance, 5-Off	0.0150	0.0150	0.0171	0.0150
Distance, 6-Off	0.0150	0.0150	0.0171	0.0150
Distance, 4-Off	0.0150	0.0150	0.0142	0.0150
Elevation	0.1353	0.1353	0.2565	0.1353
W.E., LTP, *n*-Cat I	0.0752	0.0752	0.0855	0.0752
W.E., LTP, *n*-Cat II	0.0150	0.0150	0.0142	0.0150
W.E., LTP, *n*-Cat III	0.0150	0.0150	0.0142	0.0150
W.E., LTP, *n*-Cat IV	0.0150	0.0150	0.0142	0.0150
W.E., LTP, *n*-Cat V	0.0150	0.0150	0.0142	0.0150
W.E., LTP, *n*-Cat VI	0.0150	0.0150	0.0142	0.0150
W.E., 5-Off, *n*-Cat I	0.0902	0.0902	0.0855	0.0902
W.E., 5-Off, *n*-Cat II	0.0150	0.0150	0.0142	0.0150
W.E., 5-Off, *n*-Cat III	0.0150	0.0150	0.0142	0.0150
W.E., 5-Off, *n*-Cat IV	0.0150	0.0150	0.0142	0.0150
W.E., 5-Off, *n*-Cat V	0.0150	0.0150	0.0142	0.0150
W.E., 5-Off, *n*-Cat VI	0.0150	0.0150	0.0142	0.0150
W.E., 6-Off, *n*-Cat I	0.0902	0.0902	0.0855	0.0902
W.E., 6-Off, *n*-Cat II	0.0150	0.0150	0.0142	0.0150
W.E., 6-Off, *n*-Cat III	0.0150	0.0150	0.0142	0.0150
W.E., 6-Off, *n*-Cat IV	0.0150	0.0150	0.0142	0.0150
W.E., 6-Off, *n*-Cat V	0.0150	0.0150	0.0142	0.0150
W.E., 6-Off, *n*-Cat VI	0.0150	0.0150	0.0142	0.0150
W.E., 4-Off, *n*-Cat I	0.1052	0.1052	0.0855	0.1052
W.E., 4-Off, *n*-Cat II	0.0150	0.0150	0.0142	0.0150
W.E., 4-Off, *n*-Cat III	0.0150	0.0150	0.0142	0.0150
W.E., 4-Off, *n*-Cat IV	0.0150	0.0150	0.0142	0.0150
W.E., 4-Off, *n*-Cat V	0.0150	0.0150	0.0142	0.0150
W.E., 4-Off, *n*-Cat VI	0.0150	0.0150	0.0142	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., 6-Off, *n*-Cat III	W.E., 6-Off, *n*-Cat IV	W.E., 6-Off, *n*-Cat V	W.E., 6-Off, *n*-Cat VI
Priority Vector	**0.0150**	**0.0150**	**0.0150**	**0.0150**
$C_{Rn\text{-}222}$	0.0150	0.0150	0.0150	0.0150
Distance, LTP	0.1353	0.1353	0.1353	0.1353
Distance, 5-Off	0.0150	0.0150	0.0150	0.0150
Distance, 6-Off	0.0150	0.0150	0.0150	0.0150
Distance, 4-Off	0.0150	0.0150	0.0150	0.0150
Elevation	0.1353	0.1353	0.1353	0.1353
W.E., LTP, *n*-Cat I	0.0752	0.0752	0.0752	0.0752
W.E., LTP, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat I	0.0902	0.0902	0.0902	0.0902
W.E., 5-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat I	0.0902	0.0902	0.0902	0.0902
W.E., 6-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat I	0.1052	0.1052	0.1052	0.1052
W.E., 4-Off, *n*-Cat II	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat III	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat IV	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat V	0.0150	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat VI	0.0150	0.0150	0.0150	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., 4-Off, *n*-Cat I	W.E., 4-Off, *n*-Cat II	W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV
Priority Vector	**0.1014**	**0.0150**	**0.0150**	**0.0150**
C_{Rn-222}	0.0145	0.0150	0.0150	0.0150
Distance, LTP	0.2028	0.1353	0.1353	0.1353
Distance, 5-Off	0.0169	0.0150	0.0150	0.0150
Distance, 6-Off	0.0169	0.0150	0.0150	0.0150
Distance, 4-Off	0.0145	0.0150	0.0150	0.0150
Elevation	0.2028	0.1353	0.1353	0.1353
W.E., LTP, *n*-Cat I	0.0507	0.0752	0.0752	0.0752
W.E., LTP, *n*-Cat II	0.0145	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat III	0.0145	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat IV	0.0145	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat V	0.0145	0.0150	0.0150	0.0150
W.E., LTP, *n*-Cat VI	0.0145	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat I	0.1014	0.0902	0.0902	0.0902
W.E., 5-Off, *n*-Cat II	0.0145	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat III	0.0145	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat IV	0.0145	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat V	0.0145	0.0150	0.0150	0.0150
W.E., 5-Off, *n*-Cat VI	0.0145	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat I	0.1014	0.0902	0.0902	0.0902
W.E., 6-Off, *n*-Cat II	0.0145	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat III	0.0145	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat IV	0.0145	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat V	0.0145	0.0150	0.0150	0.0150
W.E., 6-Off, *n*-Cat VI	0.0145	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat I	0.1014	0.1052	0.1052	0.1052
W.E., 4-Off, *n*-Cat II	0.0145	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat III	0.0145	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat IV	0.0145	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat V	0.0145	0.0150	0.0150	0.0150
W.E., 4-Off, *n*-Cat VI	0.0145	0.0150	0.0150	0.0150

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

	W.E., 4-Off, *n*-Cat V	W.E., 4-Off, *n*-Cat VI	WS	WS / PV
Priority Vector	**0.0150**	**0.0150**	**1.0000**	
$C_{Rn\text{-}222}$	0.0150	0.0150	0.4516	30.0471
Distance, LTP	0.1353	0.1353	4.5184	30.6251
Distance, 5-Off	0.0150	0.0150	0.4674	30.1428
Distance, 6-Off	0.0150	0.0150	0.4674	30.1428
Distance, 4-Off	0.0150	0.0150	0.4516	30.0471
Elevation	0.1353	0.1353	4.5184	30.6251
W.E., LTP, *n*-Cat I	0.0752	0.0752	2.1437	30.2582
W.E., LTP, *n*-Cat II	0.0150	0.0150	0.4516	30.0471
W.E., LTP, *n*-Cat III	0.0150	0.0150	0.4516	30.0471
W.E., LTP, *n*-Cat IV	0.0150	0.0150	0.4516	30.0471
W.E., LTP, *n*-Cat V	0.0150	0.0150	0.4516	30.0471
W.E., LTP, *n*-Cat VI	0.0150	0.0150	0.4516	30.0471
W.E., 5-Off, *n*-Cat I	0.0902	0.0902	2.5807	30.1845
W.E., 5-Off, *n*-Cat II	0.0150	0.0150	0.4516	30.0471
W.E., 5-Off, *n*-Cat III	0.0150	0.0150	0.4516	30.0471
W.E., 5-Off, *n*-Cat IV	0.0150	0.0150	0.4516	30.0471
W.E., 5-Off, *n*-Cat V	0.0150	0.0150	0.4516	30.0471
W.E., 5-Off, *n*-Cat VI	0.0150	0.0150	0.4516	30.0471
W.E., 6-Off, *n*-Cat I	0.0902	0.0902	2.5807	171.6962
W.E., 6-Off, *n*-Cat II	0.0150	0.0150	0.4516	5.2823
W.E., 6-Off, *n*-Cat III	0.0150	0.0150	0.4516	30.0471
W.E., 6-Off, *n*-Cat IV	0.0150	0.0150	0.4516	30.0471
W.E., 6-Off, *n*-Cat V	0.0150	0.0150	0.4516	30.0471
W.E., 6-Off, *n*-Cat VI	0.0150	0.0150	0.4516	30.0471
W.E., 4-Off, *n*-Cat I	0.1052	0.1052	3.0624	203.7449
W.E., 4-Off, *n*-Cat II	0.0150	0.0150	0.4516	4.4539
W.E., 4-Off, *n*-Cat III	0.0150	0.0150	0.4516	30.0471
W.E., 4-Off, *n*-Cat IV	0.0150	0.0150	0.4516	30.0471
W.E., 4-Off, *n*-Cat V	0.0150	0.0150	0.4516	30.0471
W.E., 4-Off, *n*-Cat VI	0.0150	0.0150	0.4516	30.0471

Table 271 (Cont'd). Iterative Approach: Consistency Check for Pairwise Comparison of Re-Evaluated MAUT Weighting Values

Size of *n*	30.0000
Sum	1168.0968
Sum / *n* = λ_{max}	38.9366
CI	0.3082
RI	1.5772
CR	0.1954

Table 273. Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**W.E., LTP, *n*-Cat I**	**W.E., LTP, *n*-Cat II**	**W.E., LTP, *n*-Cat III**	**W.E., LTP, *n*-Cat IV**	**W.E., LTP, *n*-Cat V**	**W.E., LTP, *n*-Cat VI**	**W.E., 5-Off, *n*-Cat I**	**W.E., 5-Off, *n*-Cat II**	**W.E., 5-Off, *n*-Cat III**	**W.E., 5-Off, *n*-Cat IV**	**W.E., 5-Off, *n*-Cat V**	**W.E., 5-Off, *n*-Cat VI**
GOAL LEVEL Weighting Factor	0.0708	0.0150	0.0150	0.0150	0.0150	0.0150	0.0855	0.0150	0.0150	0.0150	0.0150	0.0150
1	0.0897	0.0186	0.0176	0.0190	0.0197	0.0245	0.0249	0.0136	0.0131	0.0345	0.0587	0.1210
2	0.0891	0.1539	0.1174	0.0372	0.0176	0.0135	0.0774	0.0367	0.0500	0.0441	0.0345	0.0580
3	0.0916	0.0419	0.0280	0.0158	0.0169	0.0393	0.0774	0.0367	0.0500	0.0441	0.0345	0.0580
4	0.0828	0.0446	0.0438	0.1713	0.1855	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
5	0.0106	0.0137	0.0302	0.1592	0.1855	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
6	0.0768	0.1419	0.2462	0.2093	0.1855	0.1542	0.0352	0.0355	0.0513	0.1519	0.1543	0.1210
7	0.0799	0.0408	0.0404	0.0948	0.1391	0.1542	0.1622	0.1663	0.1528	0.1616	0.1543	0.1210
1A	0.1066	0.0224	0.0289	0.0375	0.0606	0.0709	0.0249	0.0136	0.0131	0.0345	0.0587	0.1210
1-Off	0.0930	0.1149	0.1099	0.0893	0.0540	0.0384	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
2-Off	0.0891	0.1539	0.1174	0.0372	0.0176	0.0135	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
3-Off	0.1024	0.1581	0.1636	0.0852	0.0444	0.0405	0.0869	0.1034	0.0500	0.0148	0.0140	0.0124
16	0.0883	0.0952	0.0567	0.0444	0.0737	0.1424	0.0127	0.0549	0.2139	0.1616	0.1543	0.1210

Table 272 (Cont'd.). Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**W.E., 6-Off, *n*-Cat I**	**W.E., 6-Off, *n*-Cat II**	**W.E., 6-Off, *n*-Cat III**	**W.E., 6-Off, *n*-Cat IV**	**W.E., 6-Off, *n*-Cat V**	**W.E., 6-Off, *n*-Cat VI**	**W.E., 4-Off, *n*-Cat I**	**W.E., 4-Off, *n*-Cat II**	**W.E., 4-Off, *n*-Cat III**	**W.E., 4-Off, *n*-Cat IV**	**W.E., 4-Off, *n*-Cat V**	**W.E., 4-Off, *n*-Cat VI**
GOAL LEVEL Weighting Factor	0.0855	0.0150	0.0150	0.0150	0.0150	0.0150	0.1014	0.0150	0.0150	0.0150	0.0150	0.0150
1	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
2	0.0864	0.0542	0.0476	0.0889	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
3	0.1156	0.0627	0.0362	0.0919	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
4	0.1690	0.1702	0.1295	0.1249	0.0975	0.0976	0.0137	0.0458	0.1280	0.1032	0.1032	0.1043
5	0.1690	0.1702	0.1295	0.1249	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
6	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.1832	0.1085	0.0970	0.1032	0.1032	0.1043
7	0.0864	0.0542	0.0476	0.0889	0.0975	0.0976	0.0254	0.0684	0.1020	0.1032	0.1032	0.1043
1A	0.0376	0.0843	0.1139	0.1007	0.0975	0.0976	0.0852	0.1509	0.1022	0.1032	0.1032	0.1043
1-Off	0.0127	0.0123	0.0116	0.0294	0.0975	0.0976	0.1039	0.0351	0.0213	0.0168	0.0167	0.0255
2-Off	0.1089	0.0795	0.0488	0.0121	0.0106	0.0107	0.1039	0.0329	0.0334	0.0438	0.0441	0.0255
3-Off	0.1021	0.0575	0.0507	0.0121	0.0140	0.0130	0.0805	0.0114	0.0106	0.0106	0.0106	0.0105
16	0.0371	0.0862	0.1569	0.1249	0.0975	0.0976	0.1832	0.1085	0.0970	0.1032	0.1032	0.1043

Table 272 (Cont'd.). Iterative Approach: Model Synthesis, Derivation of Global Priorities.

GOAL LEVEL Criterion	**Distance from TLP**	**Distance from 5-Off**	**Distance from 6-Off**	**Distance from 4-Off**	**Measured C_{Rn-222}**	**Elevation**	***GLOBAL PRIORITY***
GOAL LEVEL Weighting Factor	0.1475	0.0155	0.0155	0.0150	0.0150	0.1475	
1	0.0298	0.0334	0.0481	0.0790	0.0478	0.0447	***0.0555***
2	0.0308	0.0709	0.0479	0.0450	0.0559	0.0376	***0.0651***
3	0.0312	0.1053	0.0767	0.0527	0.0308	0.0819	***0.0648***
4	0.0284	0.1807	0.2008	0.0824	0.0631	0.0467	***0.0917***
5	0.0296	0.1107	0.1426	0.1170	0.0590	0.0461	***0.0855***
6	0.0293	0.0561	0.1562	0.1606	0.0319	0.0485	***0.0849***
7	0.0343	0.1457	0.1435	0.0616	0.0558	0.0546	***0.0803***
1A	0.0313	0.0237	0.0496	0.0825	0.4231	0.0508	***0.0652***
1-Off	0.1428	0.0326	0.0160	0.0467	0.0590	0.3985	***0.1224***
2-Off	0.2002	0.0605	0.0161	0.0335	0.0597	0.0534	***0.0868***
3-Off	0.2693	0.1670	0.0527	0.0148	0.0570	0.0737	***0.1000***
16	0.1431	0.0132	0.0500	0.2240	0.0570	0.0634	***0.0978***

Table 274. Iterative Approach: Summary of Global Priorities.

Decision Problem Alternative	Aggregated Global Priority
Location 1	0.0555
Location 2	0.0651
Location 3	0.0648
Location 4	0.0917
Location 5	0.0855
Location 6	0.0849
Location 7	0.0803
Location 1A	0.0652
Location 1-Off	0.1224
Location 2-Off	0.0868
Location 3-Off	0.1000
Location 16	0.0978

As has been done previously, the sensitivity analysis for the AHP-style analysis above is subjected to the same what-if scenarios. The effects of those deliberate manipulations on the outcome (*i.e.,* the alternatives ranking) are provided in Table 275.

Table 275. Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

	As-Is				What-If Scenario I			
	What Changed? Nothing.				What Changed? *All Criteria PV Weights Equalized.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	Criteria PV Weight	Rank	Alternative	Aggregated Global Priority	Criteria PV Weight	Rank	Alternative	Aggregated Global Priority
$C_{Rn\text{-}222}$	0.0150	1st	Loc. 1-Off	0.1224	0.0333	1st	Loc. 1	0.1163
Distance, LTP	0.1475	2nd	Loc. 3-Off	0.1000	0.0333	2nd	Loc. 2	0.1092
Distance, 5-Off	0.0155	3rd	Loc. 16	0.0978	0.0333	3rd	Loc. 3	0.1091
Distance, 6-Off	0.0155	4th	Loc. 4	0.0917	0.0333	4th	Loc. 4	0.1023
Distance, 4-Off	0.0150	5th	Loc. 2-Off	0.0868	0.0333	5th	Loc. 5	0.0981
Elevation	0.1475	6th	Loc. 5	0.0855	0.0333	6th	Loc. 6	0.0811
W.E., LTP, *n*-Cat I	0.0708	7th	Loc. 6	0.0849	0.0333	7th	Loc. 7	0.0713
W.E., LTP, *n*-Cat II	0.0150	8th	Loc. 7	0.0803	0.0333	8th	Loc. 1A	0.0652
W.E., LTP, *n*-Cat III	0.0150	9th	Loc. 1A	0.0652	0.0333	9th	Loc. 1-Off	0.0640
W.E., LTP, *n*-Cat IV	0.0150	10th	Loc. 2	0.0651	0.0333	10th	Loc. 2-Off	0.0639
W.E., LTP, *n*-Cat V	0.0150	11th	Loc. 3	0.0648	0.0333	11th	Loc. 3-Off	0.0631
W.E., LTP, *n*-Cat VI	0.0150	12th	Loc. 1	0.0555	0.0333	12th	Loc. 16	0.0563
W.E., 5-Off, *n*-Cat I	0.0855				0.0333			
W.E., 5-Off, *n*-Cat II	0.0150				0.0333			
W.E., 5-Off, *n*-Cat III	0.0150				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 5-Off, *n*-Cat V	0.0150				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0150				0.0333			
W.E., 6-Off, *n*-Cat I	0.0855				0.0333			
W.E., 6-Off, *n*-Cat II	0.0150				0.0333			
W.E., 6-Off, *n*-Cat III	0.0150				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 6-Off, *n*-Cat V	0.0150				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0150				0.0333			
W.E., 4-Off, *n*-Cat I	0.1014				0.0333			
W.E., 4-Off, *n*-Cat II	0.0150				0.0333			
W.E., 4-Off, *n*-Cat III	0.0150				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 4-Off, *n*-Cat V	0.0150				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0150				0.0333			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

	What-If Scenario II				**What-If Scenario III**			
	What Changed? ***All Wind-Related PV Weights Reduced 10% from Original "As-Is" Values.***				**What Changed?** ***All Wind-Related PV Weights Reduced 20% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0161	1st	Loc. 1-Off	0.1265	0.0173	1st	Loc. 1-Off	0.1312
Distance, LTP	0.1577	2nd	Loc. 3-Off	0.1021	0.1693	2nd	Loc. 3-Off	0.1045
Distance, 5-Off	0.0166	3rd	Loc. 16	0.0979	0.0178	3rd	Loc. 16	0.0980
Distance, 6-Off	0.0166	4th	Loc. 4	0.0903	0.0178	4th	Loc. 2-Off	0.0888
Distance, 4-Off	0.0161	5th	Loc. 2-Off	0.0877	0.0173	5th	Loc. 4	0.0886
Elevation	0.1577	6th	Loc. 5	0.0841	0.1693	6th	Loc. 5	0.0825
W.E., LTP, *n*-Cat I	0.0682	7th	Loc. 6	0.0836	0.0651	7th	Loc. 6	0.0820
W.E., LTP, *n*-Cat II	0.0145	8th	Loc. 7	0.0793	0.0138	8th	Loc. 7	0.0782
W.E., LTP, *n*-Cat III	0.0145	9th	Loc. 1A	0.0649	0.0138	9th	Loc. 1A	0.0647
W.E., LTP, *n*-Cat IV	0.0145	10th	Loc. 3	0.0646	0.0138	10th	Loc. 3	0.0643
W.E., LTP, *n*-Cat V	0.0145	11th	Loc. 2	0.0641	0.0138	11th	Loc. 2	0.0629
W.E., LTP, *n*-Cat VI	0.0145	12th	Loc. 1	0.0549	0.0138	12th	Loc. 1	0.0542
W.E., 5-Off, *n*-Cat I	0.0822				0.0785			
W.E., 5-Off, *n*-Cat II	0.0145				0.0138			
W.E., 5-Off, *n*-Cat III	0.0145				0.0138			
W.E., 5-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 5-Off, *n*-Cat V	0.0145				0.0138			
W.E., 5-Off, *n*-Cat VI	0.0145				0.0138			
W.E., 6-Off, *n*-Cat I	0.0822				0.0785			
W.E., 6-Off, *n*-Cat II	0.0145				0.0138			
W.E., 6-Off, *n*-Cat III	0.0145				0.0138			
W.E., 6-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 6-Off, *n*-Cat V	0.0145				0.0138			
W.E., 6-Off, *n*-Cat VI	0.0145				0.0138			
W.E., 4-Off, *n*-Cat I	0.0975				0.0931			
W.E., 4-Off, *n*-Cat II	0.0145				0.0138			
W.E., 4-Off, *n*-Cat III	0.0145				0.0138			
W.E., 4-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 4-Off, *n*-Cat V	0.0145				0.0138			
W.E., 4-Off, *n*-Cat VI	0.0145				0.0138			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

	What-If Scenario IV				**What-If Scenario V**			
	What Changed? ***All Wind-Related PV Weights Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related PV Weights Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0222	1st	Loc. 1-Off	0.1508	0.0153	1st	Loc. 1-Off	0.1225
Distance, LTP	0.2176	2nd	Loc. 3-Off	0.1144	0.1354	2nd	Loc. 3-Off	0.0976
Distance, 5-Off	0.0229	3rd	Loc. 16	0.0984	0.0142	3rd	Loc. 16	0.0971
Distance, 6-Off	0.0229	4th	Loc. 2-Off	0.0935	0.0142	4th	Loc. 4	0.0924
Distance, 4-Off	0.0222	5th	Loc. 4	0.0818	0.0138	5th	Loc. 5	0.0861
Elevation	0.2176	6th	Loc. 5	0.0761	0.1505	6th	Loc. 6	0.0856
W.E., LTP, *n*-Cat I	0.0522	7th	Loc. 6	0.0756	0.0722	7th	Loc. 2-Off	0.0853
W.E., LTP, *n*-Cat II	0.0111	8th	Loc. 7	0.0735	0.0153	8th	Loc. 7	0.0808
W.E., LTP, *n*-Cat III	0.0111	9th	Loc. 1A	0.0634	0.0153	9th	Loc. 1A	0.0658
W.E., LTP, *n*-Cat IV	0.0111	10th	Loc. 3	0.0631	0.0153	10th	Loc. 2	0.0657
W.E., LTP, *n*-Cat V	0.0111	11th	Loc. 2	0.0579	0.0153	11th	Loc. 3	0.0653
W.E., LTP, *n*-Cat VI	0.0111	12th	Loc. 1	0.0514	0.0153	12th	Loc. 1	0.0559
W.E., 5-Off, *n*-Cat I	0.0630				0.0872			
W.E., 5-Off, *n*-Cat II	0.0111				0.0153			
W.E., 5-Off, *n*-Cat III	0.0111				0.0153			
W.E., 5-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 5-Off, *n*-Cat V	0.0111				0.0153			
W.E., 5-Off, *n*-Cat VI	0.0111				0.0153			
W.E., 6-Off, *n*-Cat I	0.0630				0.0872			
W.E., 6-Off, *n*-Cat II	0.0111				0.0153			
W.E., 6-Off, *n*-Cat III	0.0111				0.0153			
W.E., 6-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 6-Off, *n*-Cat V	0.0111				0.0153			
W.E., 6-Off, *n*-Cat VI	0.0111				0.0153			
W.E., 4-Off, *n*-Cat I	0.0748				0.1034			
W.E., 4-Off, *n*-Cat II	0.0111				0.0153			
W.E., 4-Off, *n*-Cat III	0.0111				0.0153			
W.E., 4-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 4-Off, *n*-Cat V	0.0111				0.0153			
W.E., 4-Off, *n*-Cat VI	0.0111				0.0153			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

Criteria	**What-If Scenario VI** — What Changed? *All Distance-Related PV Weights Reduced 20% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority	**What-If Scenario VII** — What Changed? *All Distance-Related PV Weights Reduced 50% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority
$C_{Rn\text{-}222}$	0.0156	1st	Loc. 1-Off	0.1226	0.0166	1st	Loc. 1-Off	0.1230
Distance, LTP	0.1228	2nd	Loc. 16	0.0964	0.0817	2nd	Loc. 4	0.0953
Distance, 5-Off	0.0129	3rd	Loc. 3-Off	0.0950	0.0086	3rd	Loc. 16	0.0942
Distance, 6-Off	0.0129	4th	Loc. 4	0.0931	0.0086	4th	Loc. 5	0.0890
Distance, 4-Off	0.0125	5th	Loc. 5	0.0868	0.0083	5th	Loc. 6	0.0885
Elevation	0.1535	6th	Loc. 6	0.0862	0.1633	6th	Loc. 3-Off	0.0867
W.E., LTP, *n*-Cat I	0.0737	7th	Loc. 2-Off	0.0838	0.0784	7th	Loc. 7	0.0831
W.E., LTP, *n*-Cat II	0.0156	8th	Loc. 7	0.0814	0.0166	8th	Loc. 2-Off	0.0788
W.E., LTP, *n*-Cat III	0.0156	9th	Loc. 1A	0.0664	0.0166	9th	Loc. 1A	0.0683
W.E., LTP, *n*-Cat IV	0.0156	10th	Loc. 2	0.0663	0.0166	10th	Loc. 2	0.0682
W.E., LTP, *n*-Cat V	0.0156	11th	Loc. 3	0.0658	0.0166	11th	Loc. 3	0.0673
W.E., LTP, *n*-Cat VI	0.0156	12th	Loc. 1	0.0563	0.0166	12th	Loc. 1	0.0577
W.E., 5-Off, *n*-Cat I	0.0889				0.0947			
W.E., 5-Off, *n*-Cat II	0.0156				0.0166			
W.E., 5-Off, *n*-Cat III	0.0156				0.0166			
W.E., 5-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 5-Off, *n*-Cat V	0.0156				0.0166			
W.E., 5-Off, *n*-Cat VI	0.0156				0.0166			
W.E., 6-Off, *n*-Cat I	0.0889				0.0947			
W.E., 6-Off, *n*-Cat II	0.0156				0.0166			
W.E., 6-Off, *n*-Cat III	0.0156				0.0166			
W.E., 6-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 6-Off, *n*-Cat V	0.0156				0.0166			
W.E., 6-Off, *n*-Cat VI	0.0156				0.0166			
W.E., 4-Off, *n*-Cat I	0.1055				0.1123			
W.E., 4-Off, *n*-Cat II	0.0156				0.0166			
W.E., 4-Off, *n*-Cat III	0.0156				0.0166			
W.E., 4-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 4-Off, *n*-Cat V	0.0156				0.0166			
W.E., 4-Off, *n*-Cat VI	0.0156				0.0166			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? ***Elevation PV Weights Reduced 10% from Original "As-Is" Values.***				**What Changed?** ***Elevation PV Weights Reduced 20% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
$C_{Rn\text{-}222}$	0.0153	1st	Loc. 1-Off	0.1182	0.0155	1st	Loc. 1-Off	0.1140
Distance, LTP	0.1497	2nd	Loc. 3-Off	0.1004	0.1520	2nd	Loc. 3-Off	0.1008
Distance, 5-Off	0.0157	3rd	Loc. 16	0.0983	0.0160	3rd	Loc. 16	0.0988
Distance, 6-Off	0.0157	4th	Loc. 4	0.0924	0.0160	4th	Loc. 4	0.0931
Distance, 4-Off	0.0153	5th	Loc. 2-Off	0.0873	0.0155	5th	Loc. 2-Off	0.0878
Elevation	0.1348	6th	Loc. 5	0.0860	0.1216	6th	Loc. 5	0.0867
W.E., LTP, *n*-Cat I	0.0719	7th	Loc. 6	0.0854	0.0730	7th	Loc. 6	0.0860
W.E., LTP, *n*-Cat II	0.0153	8th	Loc. 7	0.0807	0.0155	8th	Loc. 7	0.0811
W.E., LTP, *n*-Cat III	0.0153	9th	Loc. 2	0.0655	0.0155	9th	Loc. 2	0.0660
W.E., LTP, *n*-Cat IV	0.0153	10th	Loc. 1A	0.0654	0.0155	10th	Loc. 1A	0.0656
W.E., LTP, *n*-Cat V	0.0153	11th	Loc. 3	0.0646	0.0155	11th	Loc. 3	0.0643
W.E., LTP, *n*-Cat VI	0.0153	12th	Loc. 1	0.0557	0.0155	12th	Loc. 1	0.0558
W.E., 5-Off, *n*-Cat I	0.0868				0.0881			
W.E., 5-Off, *n*-Cat II	0.0153				0.0155			
W.E., 5-Off, *n*-Cat III	0.0153				0.0155			
W.E., 5-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 5-Off, *n*-Cat V	0.0153				0.0155			
W.E., 5-Off, *n*-Cat VI	0.0153				0.0155			
W.E., 6-Off, *n*-Cat I	0.0868				0.0881			
W.E., 6-Off, *n*-Cat II	0.0153				0.0155			
W.E., 6-Off, *n*-Cat III	0.0153				0.0155			
W.E., 6-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 6-Off, *n*-Cat V	0.0153				0.0155			
W.E., 6-Off, *n*-Cat VI	0.0153				0.0155			
W.E., 4-Off, *n*-Cat I	0.1029				0.1045			
W.E., 4-Off, *n*-Cat II	0.0153				0.0155			
W.E., 4-Off, *n*-Cat III	0.0153				0.0155			
W.E., 4-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 4-Off, *n*-Cat V	0.0153				0.0155			
W.E., 4-Off, *n*-Cat VI	0.0153				0.0155			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

Criteria	What-If Scenario X: What Changed? *Elevation PV Weights Reduced 50% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority	What-If Scenario XI: What Changed? *Measured C_{Rn-222} PV Weights Reduced 10% from Original "As-Is" Values.* Criteria PV Weight	Alternatives Ranking: Rank	Alternative	Aggregated Global Priority
C_{Rn-222}	0.0162	1st	Loc. 3-Off	0.1021	0.0135	1st	Loc. 1-Off	0.1224
Distance, LTP	0.1593	2nd	Loc. 16	0.1005	0.1478	2nd	Loc. 3-Off	0.1001
Distance, 5-Off	0.0167	3rd	Loc. 1-Off	0.1004	0.0155	3rd	Loc. 16	0.0978
Distance, 6-Off	0.0167	4th	Loc. 4	0.0953	0.0155	4th	Loc. 4	0.0918
Distance, 4-Off	0.0162	5th	Loc. 2-Off	0.0894	0.0151	5th	Loc. 2-Off	0.0868
Elevation	0.0796	6th	Loc. 5	0.0886	0.1478	6th	Loc. 5	0.0855
W.E., LTP, *n*-Cat I	0.0765	7th	Loc. 6	0.0878	0.0710	7th	Loc. 6	0.0850
W.E., LTP, *n*-Cat II	0.0162	8th	Loc. 7	0.0824	0.0151	8th	Loc. 7	0.0803
W.E., LTP, *n*-Cat III	0.0162	9th	Loc. 2	0.0673	0.0151	9th	Loc. 2	0.0651
W.E., LTP, *n*-Cat IV	0.0162	10th	Loc. 1A	0.0664	0.0151	10th	Loc. 3	0.0649
W.E., LTP, *n*-Cat V	0.0162	11th	Loc. 3	0.0635	0.0151	11th	Loc. 1A	0.0647
W.E., LTP, *n*-Cat VI	0.0162	12th	Loc. 1	0.0564	0.0151	12th	Loc. 1	0.0555
W.E., 5-Off, *n*-Cat I	0.0923				0.0856			
W.E., 5-Off, *n*-Cat II	0.0162				0.0151			
W.E., 5-Off, *n*-Cat III	0.0162				0.0151			
W.E., 5-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 5-Off, *n*-Cat V	0.0162				0.0151			
W.E., 5-Off, *n*-Cat VI	0.0162				0.0151			
W.E., 6-Off, *n*-Cat I	0.0923				0.0856			
W.E., 6-Off, *n*-Cat II	0.0162				0.0151			
W.E., 6-Off, *n*-Cat III	0.0162				0.0151			
W.E., 6-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 6-Off, *n*-Cat V	0.0162				0.0151			
W.E., 6-Off, *n*-Cat VI	0.0162				0.0151			
W.E., 4-Off, *n*-Cat I	0.1095				0.1016			
W.E., 4-Off, *n*-Cat II	0.0162				0.0151			
W.E., 4-Off, *n*-Cat III	0.0162				0.0151			
W.E., 4-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 4-Off, *n*-Cat V	0.0162				0.0151			
W.E., 4-Off, *n*-Cat VI	0.0162				0.0151			

Table 274 (Cont'd). Sensitivity Analysis for 2nd AHP-Style Analysis (Iterative Approach).

	What-If Scenario XII				**What-If Scenario XIII**			
	What Changed? ***Measured C_{Rn-222} PV Weights Reduced 20% from Original "As-Is" Values.***				**What Changed?** ***Measured C_{Rn-222} PV Weights Reduced 50% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**	**Criteria PV Weight**	**Rank**	**Alternative**	**Aggregated Global Priority**
C_{Rn-222}	0.0121	1st	Loc. 1-Off	0.1225	0.0076	1st	Loc. 1-Off	0.1228
Distance, LTP	0.1480	2nd	Loc. 3-Off	0.1001	0.1487	2nd	Loc. 3-Off	0.1003
Distance, 5-Off	0.0156	3rd	Loc. 16	0.0979	0.0156	3rd	Loc. 16	0.0981
Distance, 6-Off	0.0156	4th	Loc. 4	0.0918	0.0156	4th	Loc. 4	0.0919
Distance, 4-Off	0.0151	5th	Loc. 2-Off	0.0868	0.0151	5th	Loc. 2-Off	0.0870
Elevation	0.1480	6th	Loc. 5	0.0855	0.1487	6th	Loc. 5	0.0857
W.E., LTP, *n*-Cat I	0.0711	7th	Loc. 6	0.0851	0.0714	7th	Loc. 6	0.0853
W.E., LTP, *n*-Cat II	0.0151	8th	Loc. 7	0.0804	0.0151	8th	Loc. 7	0.0805
W.E., LTP, *n*-Cat III	0.0151	9th	Loc. 2	0.0652	0.0151	9th	Loc. 2	0.0652
W.E., LTP, *n*-Cat IV	0.0151	10th	Loc. 3	0.0650	0.0151	10th	Loc. 3	0.0651
W.E., LTP, *n*-Cat V	0.0151	11th	Loc. 1A	0.0641	0.0151	11th	Loc. 1A	0.0625
W.E., LTP, *n*-Cat VI	0.0151	12th	Loc. 1	0.0555	0.0151	12th	Loc. 1	0.0556
W.E., 5-Off, *n*-Cat I	0.0858				0.0861			
W.E., 5-Off, *n*-Cat II	0.0151				0.0151			
W.E., 5-Off, *n*-Cat III	0.0151				0.0151			
W.E., 5-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 5-Off, *n*-Cat V	0.0151				0.0151			
W.E., 5-Off, *n*-Cat VI	0.0151				0.0151			
W.E., 6-Off, *n*-Cat I	0.0858				0.0861			
W.E., 6-Off, *n*-Cat II	0.0151				0.0151			
W.E., 6-Off, *n*-Cat III	0.0151				0.0151			
W.E., 6-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 6-Off, *n*-Cat V	0.0151				0.0151			
W.E., 6-Off, *n*-Cat VI	0.0151				0.0151			
W.E., 4-Off, *n*-Cat I	0.1017				0.1022			
W.E., 4-Off, *n*-Cat II	0.0151				0.0151			
W.E., 4-Off, *n*-Cat III	0.0151				0.0151			
W.E., 4-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 4-Off, *n*-Cat V	0.0151				0.0151			
W.E., 4-Off, *n*-Cat VI	0.0151				0.0151			

The sensitivity analysis above reveals Locations 1-Off and 3-Off to be highly ranked across nearly all what-if scenarios. Similarly, Locations 3, 1, and 1A are the least preferred alternatives for each variation. The sensitivity analysis reveals that the outcomes of the AHP-style pairwise comparison are resistant to changes in the weighting PV values.

As indicated in Table 273 and Table 274 above, the AHP-Style analysis exercise using the re-evaluated MAUT weighting values still reveals Location 1-Off to be the decision problem alternative with the highest global priority. However, this time it can be seen that the CR is now within the tolerable limit (*i.e.,* the CR is less than 0.20).

In proceeding with the Iterative Approach, the decision problem can now be analyzed via ANP. As usual, the first thing that should be done is to map out the decision problem graphically. This is presented below in Figure 49.

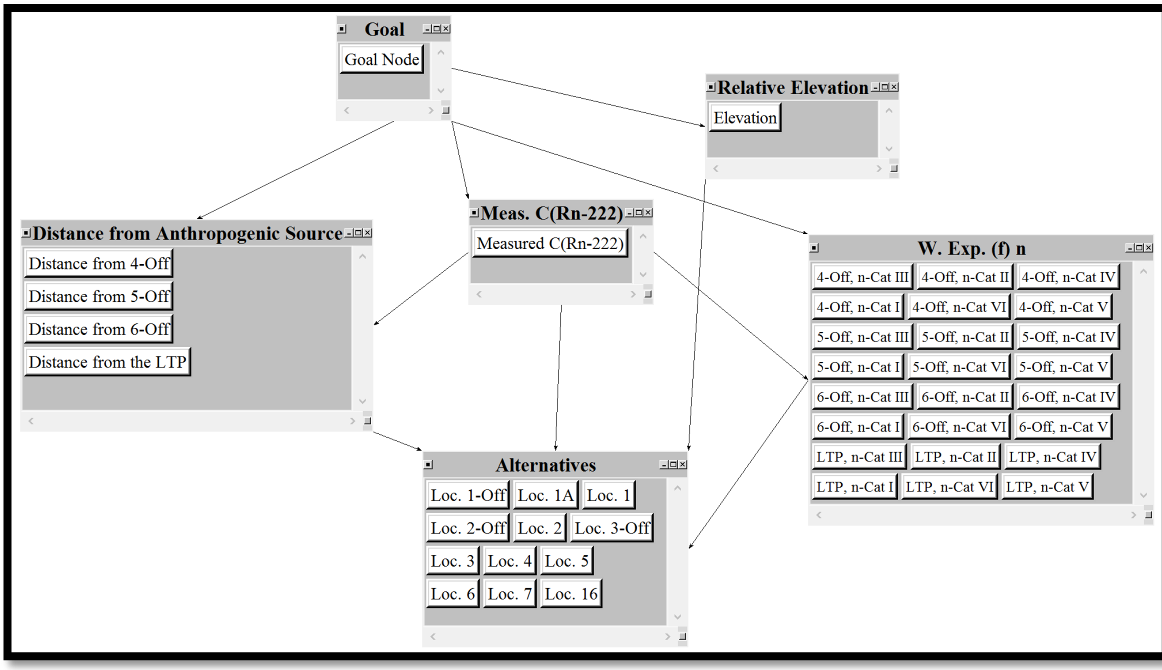

Figure 49. Iterative Approach: ANP-Style Decision Model for Dissertation Problem Statement.

As expected, even though the ANP model is based on the inputs of MAUT model, once again the benefits of modeling a decision problem via ANP should be immediately apparent. For the AHP-style analysis, the model was very straightforward: it was essentially all the lowest level alternatives analyzed with respect to each of the four main decision criteria and then all plugged into a synthesized model. However, as before, the fact that measured $\boldsymbol{C}_{\text{Rn-222}}$ is affected by distance and windward exposure from an anthropogenic source cannot be avoided in the ANP-style analysis.

With respect to the Iterative Approach, a decision problem should first be evaluated via a MAUT model. This was done. Next, an AHP-style analysis should be performed as a means to check value judgment consistency, as well as a means of validation while recognizing that the model is not truly independent. This was also done. For the ANP-style analysis, however, things diverge a bit. While the ANP-style analysis cannot be considered independent (because the same MAUT MU and weighting values that were used to create the AHP-style comparisons are, or should be, used to create the similar comparisons in the ANP-style analysis), the ANP itself compels decision-makers to view a decision problem holistically. ANP compels a decision-maker to consider relationships, structure, groupings, and hierarchies.

With the previous discussion in mind, creation of an ANP-style decision model as part of the Iterative Approach that perfectly resembles the original, independently created ANP model (*i.e.,* the one illustrated in

Figure ***22***) may be within the realm of reason and possibility but would seem somewhat unlikely for an independent decision-maker to do so with no prior knowledge of the steps taken during the Validation Approach and equally with no prior knowledge of any independent, standalone ANP analysis.

Thus, the model depicted in Figure 49 is different than the one presented in

Figure ***22*** because it was *not* developed independently, rather, it was inspired by the MAUT analysis. There are some key differences to point out: For instance, as can be seen in Figure 49, there is no separate, overarching cluster to govern the wind speed criteria; instead, "W. Exp. *f* (*n*-Cat)" is intended to address this same relationship.

As another, albeit less apparent, example, not *all* the same AHP-style pairwise comparisons that were completed in the previous step are used in the ANP-style analysis. The reason for this is simple: Both ANP and MAUT assume the decision criteria are independent, as such, it was fairly straightforward to take the MAUT MU and weighting values and use them as inputs into pairwise comparisons to derive PVs. However, an ANP analysis compels a decision-maker to create clusters and relationships between those clusters, regardless of the fact that the ANP-style model was inspired by the structure of the MAUT.

As before, the pairwise comparisons that were completed for the AHP-style analysis that are relevant (and identical) to those used in the ANP-style analysis are not duplicated. However, as before, even this new ANP-style analysis requires additional pairwise comparisons (owing their existence to the additional relationships compelled by the ANP itself). Therefore, as before, only the additional pairwise comparisons and their respective PV derivations and CR calculations are presented. Referring to Figure 49, these additional relationships are introduced in the following paragraphs.

Still referring to Figure 49, the ANP-style analysis compels the development of a pairwise comparison to assess the relationship between the clusters of Alternatives *v.* W. Exp. *f* (*n*-Cat) *v.* Distance, all with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$. The pairwise comparison, derivation of PVs, and calculation of the pairwise comparison's CR were programmed into SuperDecisions and used as part of the Iterative Approach. However, to avoid producing several pages of redundant information, readers are directed to Tables Table ***157***, Table ***158***, and Table ***159***, which are identical to those created for the Iterative Approach's ANP-style analysis. Similarly (and still referring to Figure 49), the ANP-style analysis also compels the development of a pairwise comparison to assess the relationship between the clusters of Distance from an Anthropogenic Source, Elevation, W. Exp. *f* (*n*-Cat), and Measured $\boldsymbol{C}_{\text{Rn-222}}$ with respect to the Goal. This information is identical to that found in Tables Table ***52***, Table ***53***, and Table ***54***; and therefore, it is not reproduced here in the interests of avoiding redundancy.

The ANP-style analysis also requires the development of a pairwise comparison to assess the relationship between the nodes of Distance from the LTP *v.* Distance from 5-Off *v.* Distance from 6-Off *v.* Distance from 4-Off with respect to the Goal. Identical to this is a separate pairwise comparison needed to assess the relationship between these same nodes but with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$. (In other words, there are two separate pairwise comparisons, with each comparing the same criteria, but one does so with respect to the Goal, and the other does so with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$. The elements of these pairwise comparisons (*i.e.,* the preferences) are identical.) Both of these have been programmed into SuperDecisions for the ANP-style analysis, however, only one set of tables is presented herein. Tables Table ***276***, Table ***277***, and Table ***278*** present the pairwise comparison, derivation of PVs, and calculation of the pairwise comparison's CR, respectively.

Finally, the last of the additional relationships required by the ANP-style portion of the Iterative Approach are presented in Tables Table ***279***, Table ***280***, and Table ***281***, which represent the node pairwise comparison that is needed to assess the relationship between all 24 Windward Exposure elements, each with respect to Measured $\boldsymbol{C}_{\text{Rn-222}}$, the derivation of PVs, and the calculation of the pairwise comparison's CR, respectively.

Table 276. Iterative Approach: Node Comparison with respect to Measured $C_{\text{Rn-222}}$ [and alternatively, with respect to the Goal] for Distance from 4-Off, 5-Off, 6-Off, and the LTP.

	From LTP	**From 5-Off**	**From 6-Off**	**From 4-Off**
From LTP	1.0000	8.0008	8.0008	9.0000
From 5-Off	0.1250	1.0000	1.0000	0.9992
From 6-Off	0.1250	1.0000	1.0000	0.9992
From 4-Off	0.1111	1.0008	1.0008	1.0000
Sum	1.3611	11.0016	11.0016	11.9984

Table 277. Iterative Approach: Derivation of PVs for Node Comparison with respect to Measured $C_{Rn\text{-}222}$ [and alternatively, with respect to the Goal] for Distance from 4-Off, 5-Off, 6-Off, and the LTP.

	From LTP	From 5-Off	From 6-Off	From 4-Off	PV
From LTP	0.7347	0.7272	0.7272	0.7501	0.7348
From 5-Off	0.0918	0.0909	0.0909	0.0833	0.0892
From 6-Off	0.0918	0.0909	0.0909	0.0833	0.0892
From 4-Off	0.0816	0.0910	0.0910	0.0833	0.0867

Table 278. Iterative Approach: Consistency Check for Node Comparison with respect to Measured $C_{Rn\text{-}222}$ [and alternatively, with respect to the Goal] for Distance from 4-Off, 5-Off, 6-Off, and the LTP.

	From LTP	From 5-Off	From 6-Off	From 4-Off	Weighted Sum	WS / PV
PV	0.7348	0.0892	0.0892	0.0867	1.0000	
From LTP	0.7348	0.7139	0.7139	0.7806	2.9431	4.0052
From 5-Off	0.0918	0.0892	0.0892	0.0867	0.3570	4.0006
From 6-Off	0.0918	0.0892	0.0892	0.0867	0.3570	4.0006
From 4-Off	0.0816	0.0893	0.0893	0.0867	0.3470	4.0006
Size of *n*	4.0000					
Sum	16.0070					
Sum/*n* = λ_{max}	4.0018					
CI	0.0006					
RI	0.8045					
CR	0.0007					

Table 279. Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

		W.E., LTP, *n*-Cat I	**W.E., LTP, *n*-Cat II**	**W.E., LTP, *n*-Cat III**	**W.E., LTP, *n*-Cat IV**
	Normalized Values	7.4313	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat I	7.4313	1.0000	6.4313	6.4313	6.4313
W.E., LTP, *n*-Cat II	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	1.2843	7.7156	7.7156	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	1.2843	7.7156	7.7156	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	2.5687	9.0000	9.0000	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1555	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1555	1.0000	1.0000	1.0000
Sum		9.2471	50.8625	50.8625	50.8625

Table 278 (Cont'd). Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

		W.E., LTP, *n*-Cat V	**W.E., LTP, *n*-Cat VI**	**W.E., 5-Off, *n*-Cat I**	**W.E., 5-Off, *n*-Cat II**
	Normalized Values	1.0000	1.0000	8.7156	1.0000
W.E., LTP, *n*-Cat I	7.4313	6.4313	6.4313	0.7786	6.4313
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	7.7156	7.7156	1.0000	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	7.7156	7.7156	1.0000	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	9.0000	9.0000	1.2844	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1296	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1296	1.0000
Sum		50.8625	50.8625	6.6552	50.8625

Table 278 (Cont'd). Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

		W.E., 5-Off, *n*-Cat III	**W.E., 5-Off, *n*-Cat IV**	**W.E., 5-Off, *n*-Cat V**	**W.E., 5-Off, *n*-Cat VI**
	Normalized Values	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat I	7.4313	6.4313	6.4313	6.4313	6.4313
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	7.7156	7.7156	7.7156	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	7.7156	7.7156	7.7156	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	9.0000	9.0000	9.0000	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
Sum		50.8625	50.8625	50.8625	50.8625

Table 278 (Cont'd). Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $C_{Rn\text{-}222}$.

		W.E., 6-Off, *n*-Cat I	W.E., 6-Off, *n*-Cat II	W.E., 6-Off, *n*-Cat III	W.E., 6-Off, *n*-Cat IV
	Normalized Values	8.7156	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat I	7.4313	0.7786	6.4313	6.4313	6.4313
W.E., LTP, *n*-Cat II	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	1.0000	7.7156	7.7156	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	1.0000	7.7156	7.7156	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	1.2844	9.0000	9.0000	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	0.1296	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	0.1296	1.0000	1.0000	1.0000
Sum		6.6552	50.8625	50.8625	50.8625

Table 278 (Cont'd). Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

		W.E., 6-Off, *n*-Cat V	**W.E., 6-Off, *n*-Cat VI**	**W.E., 4-Off, *n*-Cat I**	**W.E., 4-Off, *n*-Cat II**
	Normalized Values	1.0000	1.0000	10.0000	1.0000
W.E., LTP, *n*-Cat I	7.4313	6.4313	6.4313	0.3893	6.4313
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	7.7156	7.7156	0.7786	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	7.7156	7.7156	0.7786	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	9.0000	9.0000	1.0000	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	0.1111	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	0.1111	1.0000
Sum		50.8625	50.8625	5.1687	50.8625

Table 278 (Cont'd). Iterative Approach: Node Pairwise Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $C_{Rn\text{-}222}$.

		W.E., 4-Off, *n*-Cat III	W.E., 4-Off, *n*-Cat IV	W.E., 4-Off, *n*-Cat V	W.E., 4-Off, *n*-Cat VI
	Normalized Values	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat I	7.4313	6.4313	6.4313	6.4313	6.4313
W.E., LTP, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., LTP, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat I	8.7156	7.7156	7.7156	7.7156	7.7156
W.E., 5-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 5-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat I	8.7156	7.7156	7.7156	7.7156	7.7156
W.E., 6-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 6-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat I	10.0000	9.0000	9.0000	9.0000	9.0000
W.E., 4-Off, *n*-Cat II	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat III	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat IV	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat V	1.0000	1.0000	1.0000	1.0000	1.0000
W.E., 4-Off, *n*-Cat VI	1.0000	1.0000	1.0000	1.0000	1.0000
Sum		50.8625	50.8625	50.8625	50.8625

Table 280. Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $C_{\text{Rn-222}}$.

	W.E., LTP, *n*-Cat I	**W.E., LTP, *n*-Cat II**	**W.E., LTP, *n*-Cat III**	**W.E., LTP, *n*-Cat IV**
W.E., LTP, *n*-Cat I	0.1081	0.1264	0.1264	0.1264
W.E., LTP, *n*-Cat II	0.0168	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat III	0.0168	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat IV	0.0168	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat V	0.0168	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat VI	0.0168	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat I	0.1389	0.1517	0.1517	0.1517
W.E., 5-Off, *n*-Cat II	0.0168	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat III	0.0168	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat IV	0.0168	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat V	0.0168	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat VI	0.0168	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat I	0.1389	0.1517	0.1517	0.1517
W.E., 6-Off, *n*-Cat II	0.0168	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat III	0.0168	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat IV	0.0168	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat V	0.0168	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat VI	0.0168	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat I	0.2778	0.1769	0.1769	0.1769
W.E., 4-Off, *n*-Cat II	0.0168	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat III	0.0168	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat IV	0.0168	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat V	0.0168	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat VI	0.0168	0.0197	0.0197	0.0197

Table 279 (Cont'd). Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., LTP, *n*-Cat V	**W.E., LTP, *n*-Cat VI**	**W.E., 5-Off, *n*-Cat I**	**W.E., 5-Off, *n*-Cat II**
W.E., LTP, *n*-Cat I	0.1264	0.1264	0.1170	0.1264
W.E., LTP, *n*-Cat II	0.0197	0.0197	0.0195	0.0197
W.E., LTP, *n*-Cat III	0.0197	0.0197	0.0195	0.0197
W.E., LTP, *n*-Cat IV	0.0197	0.0197	0.0195	0.0197
W.E., LTP, *n*-Cat V	0.0197	0.0197	0.0195	0.0197
W.E., LTP, *n*-Cat VI	0.0197	0.0197	0.0195	0.0197
W.E., 5-Off, *n*-Cat I	0.1517	0.1517	0.1503	0.1517
W.E., 5-Off, *n*-Cat II	0.0197	0.0197	0.0195	0.0197
W.E., 5-Off, *n*-Cat III	0.0197	0.0197	0.0195	0.0197
W.E., 5-Off, *n*-Cat IV	0.0197	0.0197	0.0195	0.0197
W.E., 5-Off, *n*-Cat V	0.0197	0.0197	0.0195	0.0197
W.E., 5-Off, *n*-Cat VI	0.0197	0.0197	0.0195	0.0197
W.E., 6-Off, *n*-Cat I	0.1517	0.1517	0.1503	0.1517
W.E., 6-Off, *n*-Cat II	0.0197	0.0197	0.0195	0.0197
W.E., 6-Off, *n*-Cat III	0.0197	0.0197	0.0195	0.0197
W.E., 6-Off, *n*-Cat IV	0.0197	0.0197	0.0195	0.0197
W.E., 6-Off, *n*-Cat V	0.0197	0.0197	0.0195	0.0197
W.E., 6-Off, *n*-Cat VI	0.0197	0.0197	0.0195	0.0197
W.E., 4-Off, *n*-Cat I	0.1769	0.1769	0.1930	0.1769
W.E., 4-Off, *n*-Cat II	0.0197	0.0197	0.0195	0.0197
W.E., 4-Off, *n*-Cat III	0.0197	0.0197	0.0195	0.0197
W.E., 4-Off, *n*-Cat IV	0.0197	0.0197	0.0195	0.0197
W.E., 4-Off, *n*-Cat V	0.0197	0.0197	0.0195	0.0197
W.E., 4-Off, *n*-Cat VI	0.0197	0.0197	0.0195	0.0197

Table 279 (Cont'd). Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., 5-Off, *n*-Cat III	**W.E., 5-Off, *n*-Cat IV**	**W.E., 5-Off, *n*-Cat V**	**W.E., 5-Off, *n*-Cat VI**
W.E., LTP, *n*-Cat I	0.1264	0.1264	0.1264	0.1264
W.E., LTP, *n*-Cat II	0.0197	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat III	0.0197	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat V	0.0197	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat I	0.1517	0.1517	0.1517	0.1517
W.E., 5-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat I	0.1517	0.1517	0.1517	0.1517
W.E., 6-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat I	0.1769	0.1769	0.1769	0.1769
W.E., 4-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197

Table 279 (Cont'd). Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., 6-Off, *n*-Cat I	**W.E., 6-Off, *n*-Cat II**	**W.E., 6-Off, *n*-Cat III**	**W.E., 6-Off, *n*-Cat IV**
W.E., LTP, *n*-Cat I	0.1170	0.1264	0.1264	0.1264
W.E., LTP, *n*-Cat II	0.0195	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat III	0.0195	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat IV	0.0195	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat V	0.0195	0.0197	0.0197	0.0197
W.E., LTP, *n*-Cat VI	0.0195	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat I	0.1503	0.1517	0.1517	0.1517
W.E., 5-Off, *n*-Cat II	0.0195	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat III	0.0195	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat IV	0.0195	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat V	0.0195	0.0197	0.0197	0.0197
W.E., 5-Off, *n*-Cat VI	0.0195	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat I	0.1503	0.1517	0.1517	0.1517
W.E., 6-Off, *n*-Cat II	0.0195	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat III	0.0195	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat IV	0.0195	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat V	0.0195	0.0197	0.0197	0.0197
W.E., 6-Off, *n*-Cat VI	0.0195	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat I	0.1930	0.1769	0.1769	0.1769
W.E., 4-Off, *n*-Cat II	0.0195	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat III	0.0195	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat IV	0.0195	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat V	0.0195	0.0197	0.0197	0.0197
W.E., 4-Off, *n*-Cat VI	0.0195	0.0197	0.0197	0.0197

Table 279 (Cont'd). Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., 6-Off, *n*-Cat V	**W.E., 6-Off, *n*-Cat VI**	**W.E., 4-Off, *n*-Cat I**	**W.E., 4-Off, *n*-Cat II**
W.E., LTP, *n*-Cat I	0.1264	0.1264	0.0753	0.1264
W.E., LTP, *n*-Cat II	0.0197	0.0197	0.0215	0.0197
W.E., LTP, *n*-Cat III	0.0197	0.0197	0.0215	0.0197
W.E., LTP, *n*-Cat IV	0.0197	0.0197	0.0215	0.0197
W.E., LTP, *n*-Cat V	0.0197	0.0197	0.0215	0.0197
W.E., LTP, *n*-Cat VI	0.0197	0.0197	0.0215	0.0197
W.E., 5-Off, *n*-Cat I	0.1517	0.1517	0.1506	0.1517
W.E., 5-Off, *n*-Cat II	0.0197	0.0197	0.0215	0.0197
W.E., 5-Off, *n*-Cat III	0.0197	0.0197	0.0215	0.0197
W.E., 5-Off, *n*-Cat IV	0.0197	0.0197	0.0215	0.0197
W.E., 5-Off, *n*-Cat V	0.0197	0.0197	0.0215	0.0197
W.E., 5-Off, *n*-Cat VI	0.0197	0.0197	0.0215	0.0197
W.E., 6-Off, *n*-Cat I	0.1517	0.1517	0.1506	0.1517
W.E., 6-Off, *n*-Cat II	0.0197	0.0197	0.0215	0.0197
W.E., 6-Off, *n*-Cat III	0.0197	0.0197	0.0215	0.0197
W.E., 6-Off, *n*-Cat IV	0.0197	0.0197	0.0215	0.0197
W.E., 6-Off, *n*-Cat V	0.0197	0.0197	0.0215	0.0197
W.E., 6-Off, *n*-Cat VI	0.0197	0.0197	0.0215	0.0197
W.E., 4-Off, *n*-Cat I	0.1769	0.1769	0.1935	0.1769
W.E., 4-Off, *n*-Cat II	0.0197	0.0197	0.0215	0.0197
W.E., 4-Off, *n*-Cat III	0.0197	0.0197	0.0215	0.0197
W.E., 4-Off, *n*-Cat IV	0.0197	0.0197	0.0215	0.0197
W.E., 4-Off, *n*-Cat V	0.0197	0.0197	0.0215	0.0197
W.E., 4-Off, *n*-Cat VI	0.0197	0.0197	0.0215	0.0197

Table 279 (Cont'd). Iterative Approach: Derivation of PVs for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., 4-Off, *n*-Cat III	**W.E., 4-Off, *n*-Cat IV**	**W.E., 4-Off, *n*-Cat V**	**W.E., 4-Off, *n*-Cat VI**	**PV**
W.E., LTP, *n*-Cat I	0.1264	0.1264	0.1264	0.1264	0.1228
W.E., LTP, *n*-Cat II	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., LTP, *n*-Cat III	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., LTP, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., LTP, *n*-Cat V	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., LTP, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 5-Off, *n*-Cat I	0.1517	0.1517	0.1517	0.1517	0.1510
W.E., 5-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 5-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 5-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 5-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 5-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 6-Off, *n*-Cat I	0.1517	0.1517	0.1517	0.1517	0.1510
W.E., 6-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 6-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 6-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 6-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 6-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 4-Off, *n*-Cat I	0.1769	0.1769	0.1769	0.1769	0.1832
W.E., 4-Off, *n*-Cat II	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 4-Off, *n*-Cat III	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 4-Off, *n*-Cat IV	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 4-Off, *n*-Cat V	0.0197	0.0197	0.0197	0.0197	0.0196
W.E., 4-Off, *n*-Cat VI	0.0197	0.0197	0.0197	0.0197	0.0196

Table 281. Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all Windward Exposure Elements with respect to the Measured $C_{\text{Rn-222}}$.

	W.E., LTP, *n*-Cat I	**W.E., LTP, *n*-Cat II**	**W.E., LTP, *n*-Cat III**	**W.E., LTP, *n*-Cat IV**
Priority Vector	**0.1228**	**0.0196**	**0.0196**	**0.0196**
W.E., LTP, *n*-Cat I	0.1228	0.1261	0.1261	0.1261
W.E., LTP, *n*-Cat II	0.0191	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat III	0.0191	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat IV	0.0191	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat V	0.0191	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat VI	0.0191	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat I	0.1577	0.1513	0.1513	0.1513
W.E., 5-Off, *n*-Cat II	0.0191	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat III	0.0191	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat IV	0.0191	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat V	0.0191	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat VI	0.0191	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat I	0.1577	0.1513	0.1513	0.1513
W.E., 6-Off, *n*-Cat II	0.0191	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat III	0.0191	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat IV	0.0191	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat V	0.0191	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat VI	0.0191	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat I	0.3153	0.1764	0.1764	0.1764
W.E., 4-Off, *n*-Cat II	0.0191	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat III	0.0191	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat IV	0.0191	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat V	0.0191	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat VI	0.0191	0.0196	0.0196	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., LTP, *n*-Cat V	**W.E., LTP, *n*-Cat VI**	**W.E., 5-Off, *n*-Cat I**	**W.E., 5-Off, *n*-Cat II**
Priority Vector	**0.0196**	**0.0196**	**0.1510**	**0.0196**
W.E., LTP, *n*-Cat I	0.1261	0.1261	0.1176	0.1261
W.E., LTP, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat I	0.1513	0.1513	0.1510	0.1513
W.E., 5-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat I	0.1513	0.1513	0.1510	0.1513
W.E., 6-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat I	0.1764	0.1764	0.1939	0.1764
W.E., 4-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $\boldsymbol{C}_{\text{Rn-222}}$.

	W.E., 5-Off, *n*-Cat III	**W.E., 5-Off, *n*-Cat IV**	**W.E., 5-Off, *n*-Cat V**	**W.E., 5-Off, *n*-Cat VI**
Priority Vector	**0.0196**	**0.0196**	**0.0196**	**0.0196**
W.E., LTP, *n*-Cat I	0.1261	0.1261	0.1261	0.1261
W.E., LTP, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat I	0.1513	0.1513	0.1513	0.1513
W.E., 5-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat I	0.1513	0.1513	0.1513	0.1513
W.E., 6-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat I	0.1764	0.1764	0.1764	0.1764
W.E., 4-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $C_{\text{Rn-222}}$.

	W.E., 6-Off, *n*-Cat I	**W.E., 6-Off, *n*-Cat II**	**W.E., 6-Off, *n*-Cat III**	**W.E., 6-Off, *n*-Cat IV**
Priority Vector	**0.1510**	**0.0196**	**0.0196**	**0.0196**
W.E., LTP, *n*-Cat I	0.1176	0.1261	0.1261	0.1261
W.E., LTP, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat I	0.1510	0.1513	0.1513	0.1513
W.E., 5-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat I	0.1510	0.1513	0.1513	0.1513
W.E., 6-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat I	0.1939	0.1764	0.1764	0.1764
W.E., 4-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $C_{Rn\text{-}222}$.

	W.E., 6-Off, *n*-Cat V	**W.E., 6-Off, *n*-Cat VI**	**W.E., 4-Off, *n*-Cat I**	**W.E., 4-Off, *n*-Cat II**
Priority Vector	**0.0196**	**0.0196**	**0.1832**	**0.0196**
W.E., LTP, *n*-Cat I	0.1261	0.1261	0.0713	0.1261
W.E., LTP, *n*-Cat II	0.0196	0.0196	0.0204	0.0196
W.E., LTP, *n*-Cat III	0.0196	0.0196	0.0204	0.0196
W.E., LTP, *n*-Cat IV	0.0196	0.0196	0.0204	0.0196
W.E., LTP, *n*-Cat V	0.0196	0.0196	0.0204	0.0196
W.E., LTP, *n*-Cat VI	0.0196	0.0196	0.0204	0.0196
W.E., 5-Off, *n*-Cat I	0.1513	0.1513	0.1426	0.1513
W.E., 5-Off, *n*-Cat II	0.0196	0.0196	0.0204	0.0196
W.E., 5-Off, *n*-Cat III	0.0196	0.0196	0.0204	0.0196
W.E., 5-Off, *n*-Cat IV	0.0196	0.0196	0.0204	0.0196
W.E., 5-Off, *n*-Cat V	0.0196	0.0196	0.0204	0.0196
W.E., 5-Off, *n*-Cat VI	0.0196	0.0196	0.0204	0.0196
W.E., 6-Off, *n*-Cat I	0.1513	0.1513	0.1426	0.1513
W.E., 6-Off, *n*-Cat II	0.0196	0.0196	0.0204	0.0196
W.E., 6-Off, *n*-Cat III	0.0196	0.0196	0.0204	0.0196
W.E., 6-Off, *n*-Cat IV	0.0196	0.0196	0.0204	0.0196
W.E., 6-Off, *n*-Cat V	0.0196	0.0196	0.0204	0.0196
W.E., 6-Off, *n*-Cat VI	0.0196	0.0196	0.0204	0.0196
W.E., 4-Off, *n*-Cat I	0.1764	0.1764	0.1832	0.1764
W.E., 4-Off, *n*-Cat II	0.0196	0.0196	0.0204	0.0196
W.E., 4-Off, *n*-Cat III	0.0196	0.0196	0.0204	0.0196
W.E., 4-Off, *n*-Cat IV	0.0196	0.0196	0.0204	0.0196
W.E., 4-Off, *n*-Cat V	0.0196	0.0196	0.0204	0.0196
W.E., 4-Off, *n*-Cat VI	0.0196	0.0196	0.0204	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $C_{\text{Rn-222}}$.

	W.E., 4-Off, *n*-Cat III	**W.E., 4-Off, *n*-Cat IV**	**W.E., 4-Off, *n*-Cat V**	**W.E., 4-Off, *n*-Cat VI**
Priority Vector	**0.0196**	**0.0196**	**0.0196**	**0.0196**
W.E., LTP, *n*-Cat I	0.1261	0.1261	0.1261	0.1261
W.E., LTP, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., LTP, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat I	0.1513	0.1513	0.1513	0.1513
W.E., 5-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 5-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat I	0.1513	0.1513	0.1513	0.1513
W.E., 6-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 6-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat I	0.1764	0.1764	0.1764	0.1764
W.E., 4-Off, *n*-Cat II	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat III	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat IV	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat V	0.0196	0.0196	0.0196	0.0196
W.E., 4-Off, *n*-Cat VI	0.0196	0.0196	0.0196	0.0196

Table 280 (Cont'd). Iterative Approach: Consistency Check for Comparison pertaining to the Relationship between all W. Exp. Elements with respect to the Measured $C_{Rn\text{-}222}$.

	WS	WS / PV
Priority Vector	1.0000	
W.E., LTP, *n*-Cat I	2.9507	24.0355
W.E., LTP, *n*-Cat II	0.4706	24.0086
W.E., LTP, *n*-Cat III	0.4706	24.0086
W.E., LTP, *n*-Cat IV	0.4706	24.0086
W.E., LTP, *n*-Cat V	0.4706	24.0086
W.E., LTP, *n*-Cat VI	0.4706	24.0086
W.E., 5-Off, *n*-Cat I	3.6273	24.0222
W.E., 5-Off, *n*-Cat II	0.4706	24.0086
W.E., 5-Off, *n*-Cat III	0.4706	24.0086
W.E., 5-Off, *n*-Cat IV	0.4706	24.0086
W.E., 5-Off, *n*-Cat V	0.4706	24.0086
W.E., 5-Off, *n*-Cat VI	0.4706	24.0086
W.E., 6-Off, *n*-Cat I	3.6273	24.0222
W.E., 6-Off, *n*-Cat II	0.4706	24.0086
W.E., 6-Off, *n*-Cat III	0.4706	24.0086
W.E., 6-Off, *n*-Cat IV	0.4706	24.0086
W.E., 6-Off, *n*-Cat V	0.4706	24.0086
W.E., 6-Off, *n*-Cat VI	0.4706	24.0086
W.E., 4-Off, *n*-Cat I	4.4150	225.2171
W.E., 4-Off, *n*-Cat II	0.4706	2.5694
W.E., 4-Off, *n*-Cat III	0.4706	24.0086
W.E., 4-Off, *n*-Cat IV	0.4706	24.0086
W.E., 4-Off, *n*-Cat V	0.4706	24.0086
W.E., 4-Off, *n*-Cat VI	0.4706	24.0086
Size of *n*		24.0000
Sum		756.0304
Sum / *n* = λ_{max}		31.5013
CI		0.3261
RI		1.5619
CR		0.2088

The global rankings, along with the total (*i.e., raw* non-normalized), normalized, and ideal results of the alternatives cluster of the ANP analysis[104] are presented in Figure 50 below, which is a screenshot image from the DSS. A comprehensive summary of all the rankings and similar results for all the nodes and clusters is provided in Table 282.

Alternative Rankings

Graphic	Alternatives	Total	Normal	Ideal	Ranking
	Loc. 1	0.0260	0.0528	0.3890	12
	Loc. 1-Off	0.0669	0.1357	1.0000	1
	Loc. 1A	0.0308	0.0625	0.4610	9
	Loc. 2	0.0274	0.0555	0.4093	11
	Loc. 2-Off	0.0448	0.0909	0.6701	4
	Loc. 3	0.0300	0.0609	0.4490	10
	Loc. 3-Off	0.0571	0.1158	0.8534	2
	Loc. 4	0.0419	0.0849	0.6262	5
	Loc. 5	0.0394	0.0799	0.5886	7
	Loc. 6	0.0397	0.0804	0.5930	6
	Loc. 7	0.0374	0.0758	0.5586	8
	Loc. 16	0.0517	0.1049	0.7733	3

Figure 50. Iterative Approach: Summary of Global Priorities.

[104] Appendix B to this dissertation contains a PDF of the Full Report created from the SuperDecisions software.

Table 282. Iterative Approach: Summary of Global Priorities Normalized by Cluster.

Cluster Name	Name	Normalized By Cluster	Limiting
Distance	Distance from 4-Off	0.08671	0.0149
	Distance from 5-Off	0.08921	0.01533
	Distance from 6-Off	0.08921	0.01533
	Distance from the LTP	0.73488	0.12628
$C_{\mathrm{Rn\text{-}222}}$	Measured C(Rn-222)	1.0000	0.02051
Elevation	Elevation	1.0000	0.08595
Wind Speed Categories	4-Off, *n*-Cat I	0.0459	0.01049
	4-Off, *n*-Cat II	0.04101	0.00937
	4-Off, *n*-Cat III	0.04101	0.00937
	4-Off, *n*-Cat IV	0.04101	0.00937
	4-Off, *n*-Cat V	0.04101	0.00937
	4-Off, *n*-Cat VI	0.04101	0.00937
	5-Off, *n*-Cat I	0.04494	0.01027
	5-Off, *n*-Cat II	0.04101	0.00937
	5-Off, *n*-Cat III	0.04101	0.00937
	5-Off, *n*-Cat IV	0.04101	0.00937
	5-Off, *n*-Cat V	0.04101	0.00937
	5-Off, *n*-Cat VI	0.04101	0.00937
	6-Off, *n*-Cat I	0.04494	0.01027
	6-Off, *n*-Cat II	0.04101	0.00937
	6-Off, *n*-Cat III	0.04101	0.00937
	6-Off, *n*-Cat IV	0.04101	0.00937
	6-Off, *n*-Cat V	0.04101	0.00937
	6-Off, *n*-Cat VI	0.04101	0.00937
	LTP, *n*-Cat I	0.04409	0.01008
	LTP, *n*-Cat II	0.04101	0.00937
	LTP, *n*-Cat III	0.04101	0.00937
	LTP, *n*-Cat IV	0.04101	0.00937
	LTP, *n*-Cat V	0.04101	0.00937
	LTP, *n*-Cat VI	0.04101	0.00937
Alternatives	Loc. 1	0.05277	0.02602
	Loc. 1-Off	0.13566	0.0669
	Loc. 1A	0.06254	0.03084
	Loc. 2	0.05552	0.02738
	Loc. 2-Off	0.0909	0.04483
	Loc. 3	0.06092	0.03004
	Loc. 3-Off	0.11577	0.05709
	Loc. 4	0.08495	0.04189
	Loc. 5	0.07985	0.03938
	Loc. 6	0.08045	0.03967
	Loc. 7	0.07577	0.03737
	Loc. 16	0.10491	0.05174

As with the initial ANP analysis, a sensitivity analysis was performed with the SuperDecisions software and is presented in the following figures. There are 43 different manipulations that could be made to conduct the sensitivity analysis, one for each node in the ANP-style model (*see* Figure 49). An excerpt of 12 of these manipulations (those that pertain to each of the nodes in the Alternatives cluster) are presented as screenshots from the DSS and are introduced as follows:

- Figure 51 depicts what effect changing the ranking of Location 1 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 52 depicts what effect changing the ranking of Location 1-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 53 depicts what effect changing the ranking of Location 1A to zero would have on the overall global priority rankings of the other alternatives;
- Figure 54 depicts what effect changing the ranking of Location 2 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 55 depicts what effect changing the ranking of Location 2-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 56 depicts what effect changing the ranking of Location 3 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 57 depicts what effect changing the ranking of Location 3-Off to zero would have on the overall global priority rankings of the other alternatives;
- Figure 58 depicts what effect changing the ranking of Location 4 to zero would have on the overall global priority rankings of the other alternatives;

- Figure 59 depicts what effect changing the ranking of Location 5 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 60 depicts what effect changing the ranking of Location 6 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 61 depicts what effect changing the ranking of Location 7 to zero would have on the overall global priority rankings of the other alternatives;
- Figure 62 depicts what effect changing the ranking of Location 16 to zero would have on the overall global priority rankings of the other alternatives;

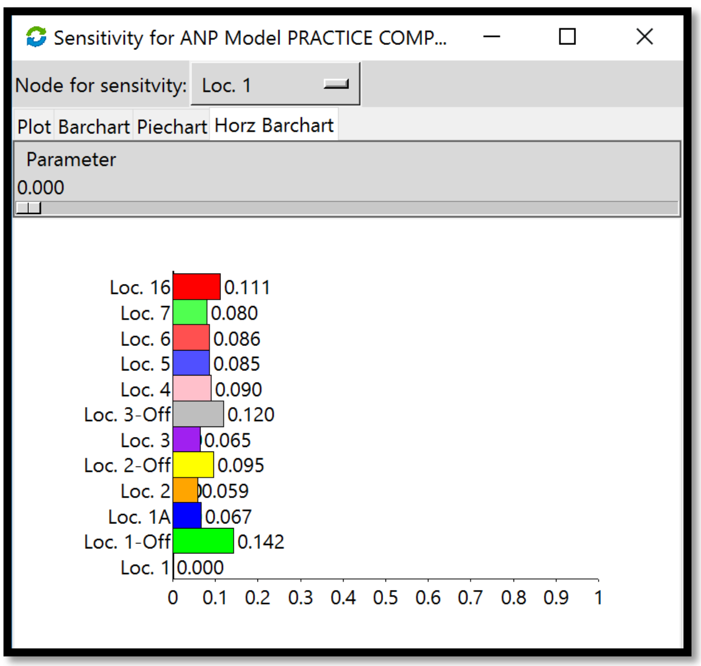

Figure 51. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1 Manipulated to Zero.

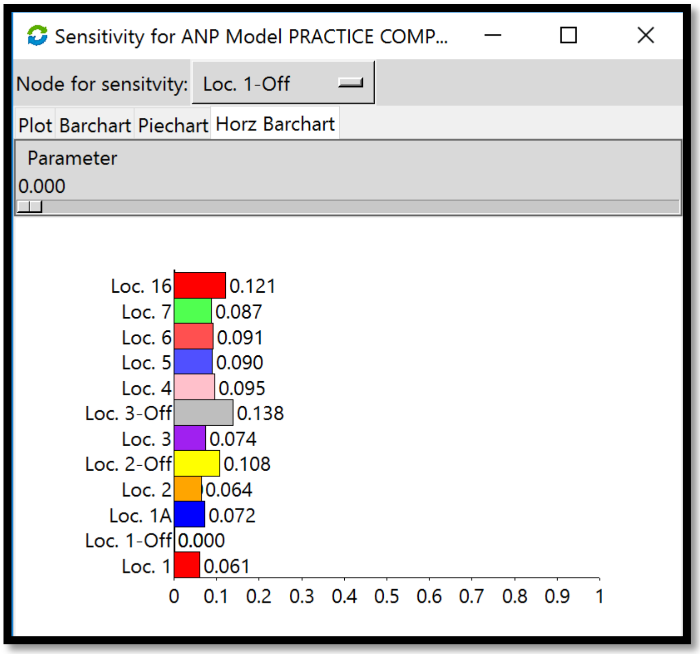

Figure 52. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1-Off Manipulated to Zero.

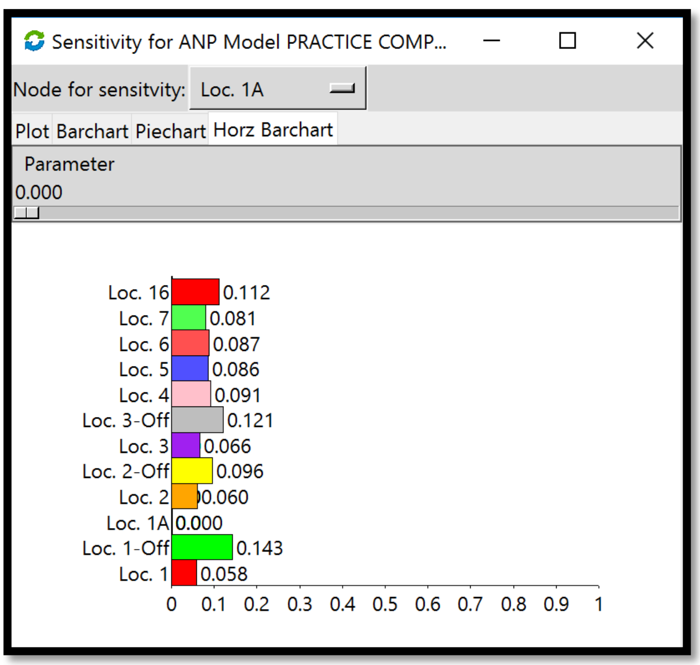

Figure 53. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 1A Manipulated to Zero.

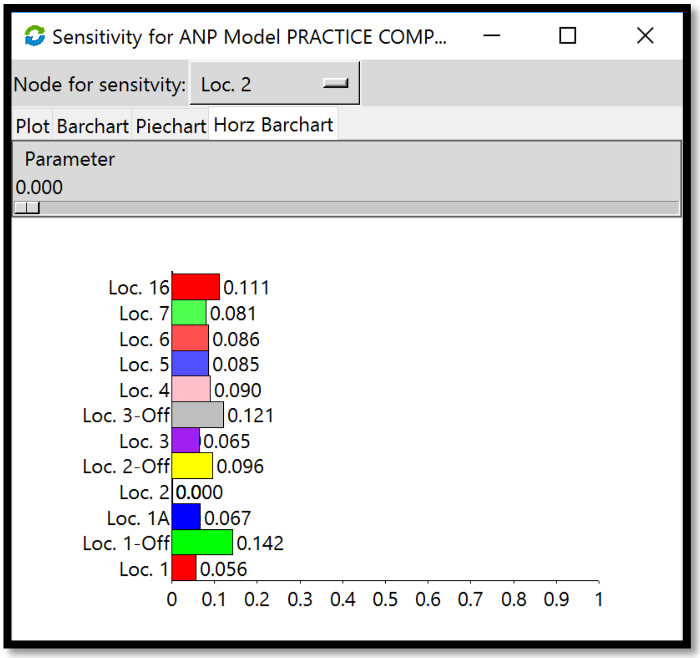

Figure 54. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 2 Manipulated to Zero.

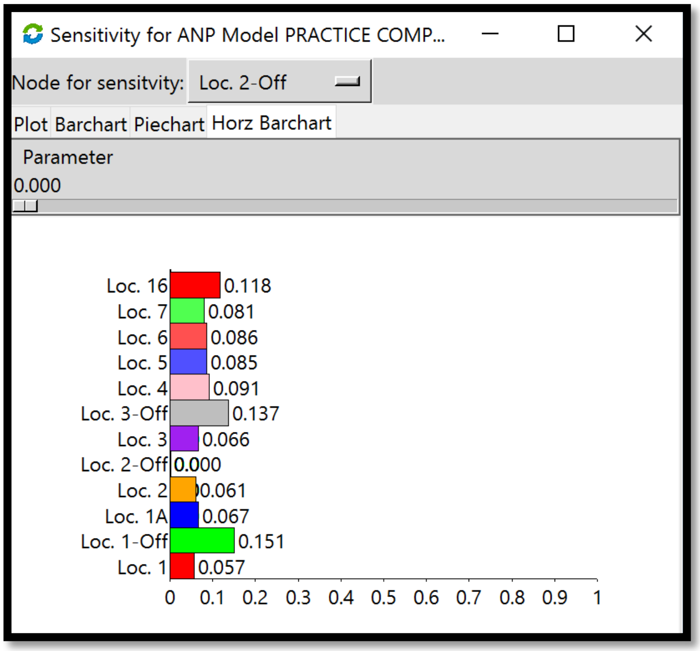

Figure 55. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 2-Off Manipulated to Zero.

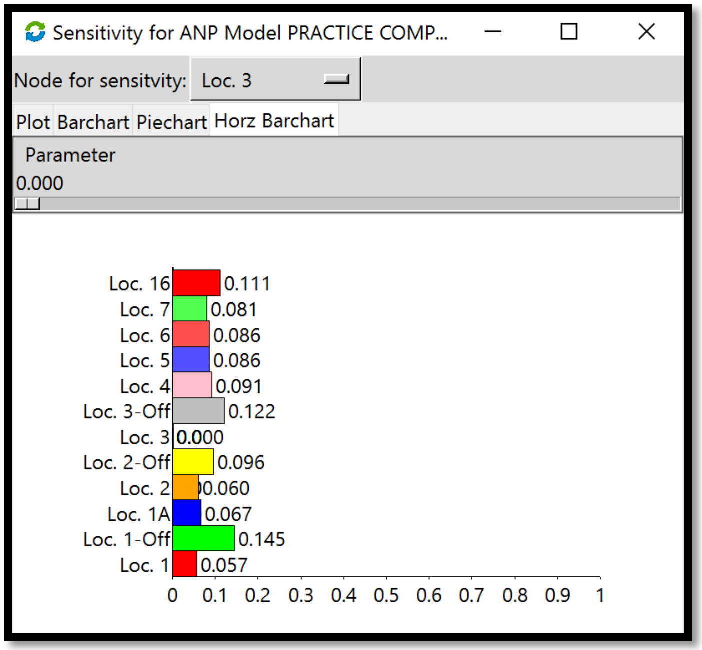

Figure 56. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 3 Manipulated to Zero.

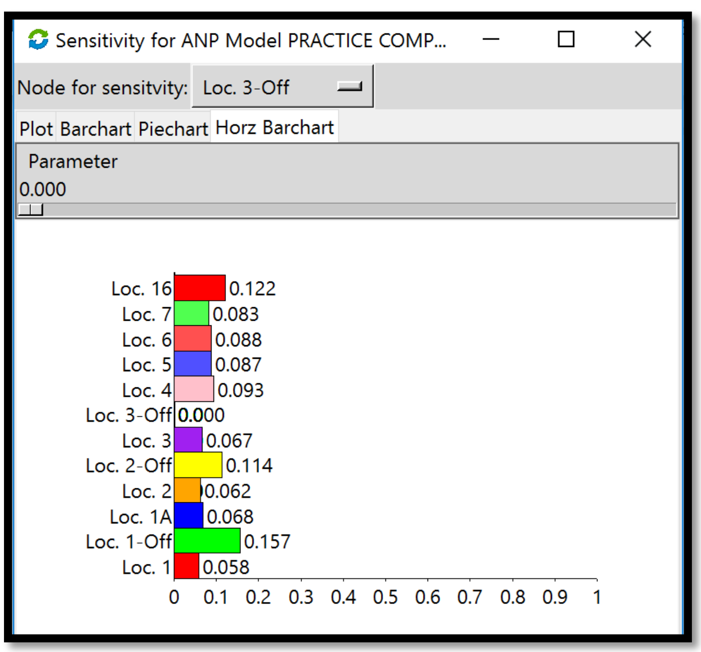

Figure 57. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 3-Off Manipulated to Zero.

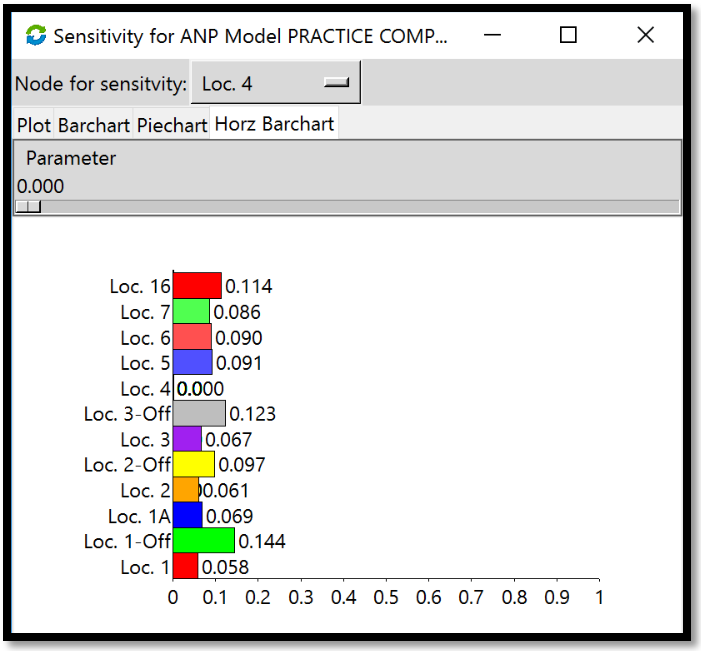

Figure 58. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 4 Manipulated to Zero.

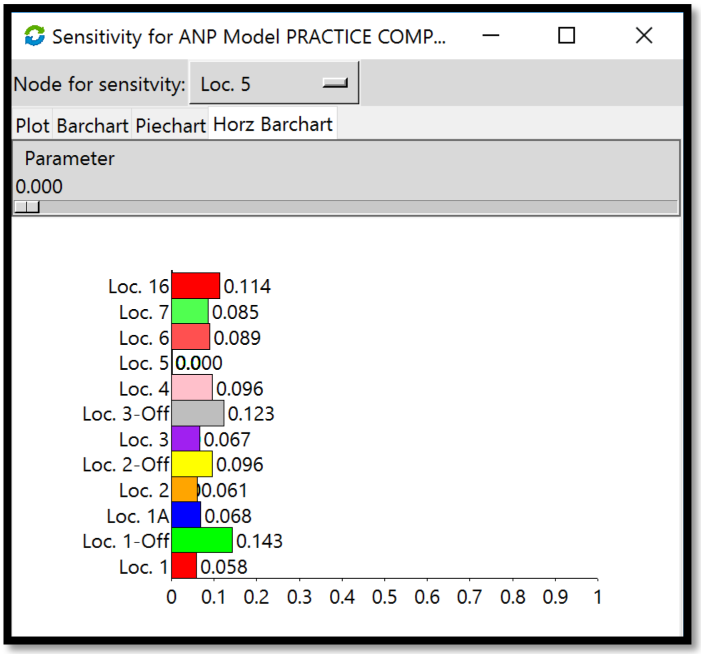

Figure 59. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 5 Manipulated to Zero.

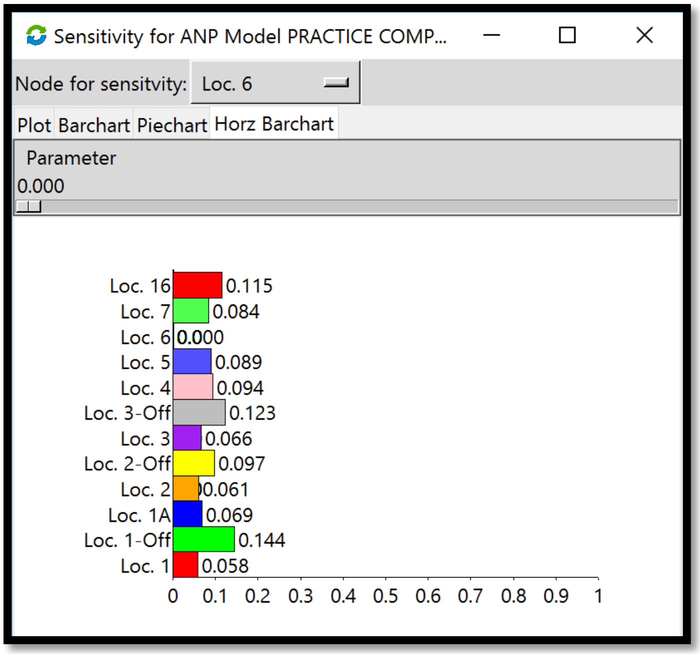

Figure 60. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 6 Manipulated to Zero.

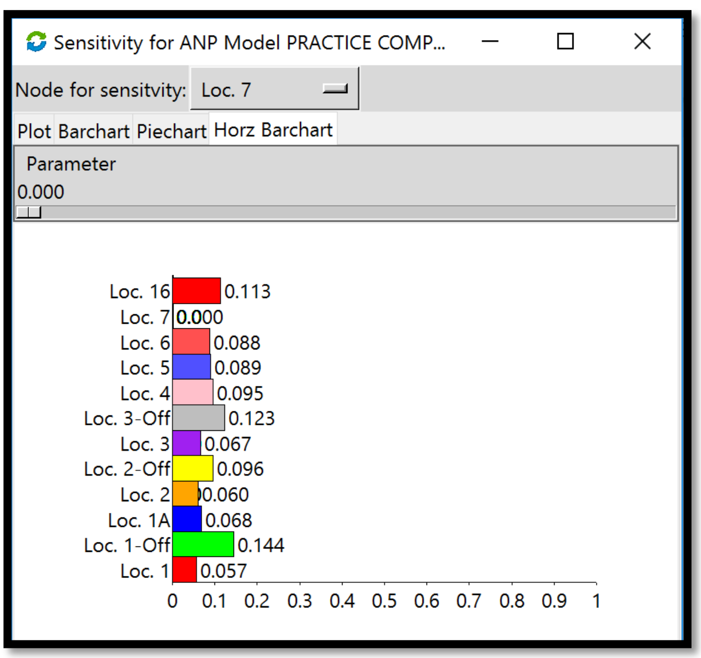

Figure 61. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 7 Manipulated to Zero.

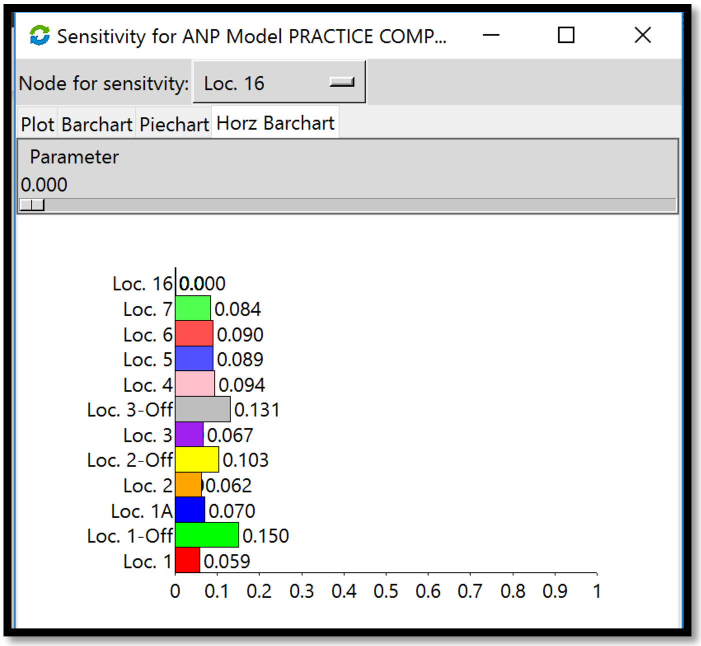

Figure 62. Specimen: Iterative Approach, Analysis via ANP: Screenshot of Sensitivity Analysis Showing Effects on Alternatives After Alternative Loc. 16 Manipulated to Zero.

It is now observable and defensible that the results of the AHP-style analysis are supported by the ANP-style portion of the Iterative Approach. The ANP-style portion of the Iterative Approach has revealed Location 1-Off to be the most rational choice, and this is further supported by the inclusion of the above sensitivity analysis. This brings the Iterative Approach to the conclusion of its first iteration, but the process is not yet complete. The focus now returns back to the MAUT to determine whether or not the priorities developed in the AHP- and ANP-style portions will be accepted.

As indicated by Figure 47, the Iterative Approach prescribes two ways to accomplish this: Either using the results of the AHP- or ANP-style analysis (*i.e.,* the synthesized global priorities developed by the respective model). Since the AHP-style results are "de-clustered," they are preferred. Accordingly, the ungrouped global priorities of the AHP-style portion of the Iterative

Approach can now be used as direct inputs (as weighting factors) in the MAUT model. As is now known, the CR calculated in Table 266 (*see* p. 486) was intolerable and compelled a re-evaluation of the inputs; those re-evaluated inputs are identical to those found in Table 167 (*see* Table 167, under column headings: "New MAUT Weighting Factor (Directly Assigned)" and "New MAUT Weighting Factor (Normalized)"), and a subsequent CR calculation was performed (*see* Table 272, p. 526) and revealed tolerable results. The PVs associated with these re-evaluated inputs (*see* Table 271, p. 518) are the numbers of interest for the second iteration and makes the remaining work here very straightforward.

Putting all the pieces together, using the global priorities that were developed in the AHP-style portion as weighting factors into the MAUT model, a second iteration can now be performed. Since no changes are being considered for any of the MAUT MU values, the second iteration can focus squarely on the final step in the MAUT process, the determination of the aggregated global utility scores. The results of the second iteration are presented below in Table 283, and a summary of the aggregated global utility scores is given in Table 284.

Table 283. Iterative Approach: 2nd Iteration: Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 1		Loc. 2		Loc. 3	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0150	1.3707	**0.0206**	1.1667	**0.0175**	1.5341	**0.0231**
Distance from LTP	0.1475	1.0057	**0.1484**	1.9028	**0.2807**	1.9190	**0.2831**
Distance from 5-Off	0.0155	4.6027	**0.0714**	6.1099	**0.0947**	8.0278	**0.1245**
Distance from 6-Off	0.0155	5.4160	**0.0840**	5.1406	**0.0797**	6.7575	**0.1048**
Distance form 4-Off	0.0150	6.6796	**0.1004**	4.9670	**0.0747**	4.6132	**0.0693**
Elevation	0.1475	1.8514	**0.2732**	1.6976	**0.2505**	3.4286	**0.5059**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	0.0708	8.1428	**0.5769**	9.3046	**0.6592**	8.0083	**0.5674**
$2.1 < n < 3.6$ m/s	0.0150	2.3346	**0.0351**	9.1066	**0.1369**	5.2794	**0.0794**
$3.6 < n < 5.7$ m/s	0.0150	1.0000	**0.0150**	6.9111	**0.1039**	2.5209	**0.0379**
$5.7 < n < 8.8$ m/s	0.0150	1.0000	**0.0150**	4.1053	**0.0617**	1.3298	**0.0200**
$8.8 < n < 11.1$ m/s	0.0150	2.2761	**0.0342**	1.0000	**0.0150**	1.5373	**0.0231**
$n > 11.1$ m/s	0.0150	3.4286	**0.0515**	1.0000	**0.0150**	5.3571	**0.0805**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0855	3.9072	**0.3341**	7.2474	**0.6196**	7.2474	**0.6196**
$2.1 < n < 3.6$ m/s	0.0150	1.0000	**0.0150**	4.9162	**0.0739**	4.9162	**0.0739**
$3.6 < n < 5.7$ m/s	0.0150	1.0000	**0.0150**	6.0969	**0.0916**	6.0969	**0.0916**
$5.7 < n < 8.8$ m/s	0.0150	4.0782	**0.0613**	5.2508	**0.0789**	5.2508	**0.0789**
$8.8 < n < 11.1$ m/s	0.0150	6.6038	**0.0993**	4.5660	**0.0686**	4.5660	**0.0686**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	7.5250	**0.1131**	7.5250	**0.1131**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0855	5.3185	**0.4547**	7.4961	**0.6409**	8.1853	**0.6998**
$2.1 < n < 3.6$ m/s	0.0150	7.9022	**0.1188**	6.2317	**0.0937**	6.8532	**0.1030**
$3.6 < n < 5.7$ m/s	0.0150	8.8893	**0.1336**	6.6471	**0.0999**	5.4637	**0.0821**
$5.7 < n < 8.8$ m/s	0.0150	9.0000	**0.1353**	8.2222	**0.1236**	7.7778	**0.1169**
$8.8 < n < 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.1014	7.3711	**0.7474**	7.3711	**0.7474**	3.6211	**0.3672**
$2.1 < n < 3.6$ m/s	0.0150	9.6629	**0.1452**	9.6629	**0.1452**	7.8258	**0.1176**
$3.6 < n < 5.7$ m/s	0.0150	9.7775	**0.1470**	9.7775	**0.1470**	9.7330	**0.1463**
$5.7 < n < 8.8$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
$8.8 < n < 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Aggregated Utility Score		-	**4.7342**	-	**5.5846**	-	**5.3491**

Table 282 (Cont'd). Iterative Approach: 2nd Iteration: Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 4		Loc. 5		Loc. 6	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0150	1.1078	**0.0167**	1.2373	**0.0186**	1.6256	**0.0244**
Distance from LTP	0.1475	2.4161	**0.3565**	1.0000	**0.1475**	1.7342	**0.2559**
Distance from 5-Off	0.0155	9.6630	**0.1498**	8.1455	**0.1263**	6.3883	**0.0991**
Distance from 6-Off	0.0155	10.0000	**0.1551**	8.9350	**0.1385**	8.5381	**0.1324**
Distance form 4-Off	0.0150	6.4887	**0.0975**	7.8420	**0.1179**	8.8056	**0.1324**
Elevation	0.1475	1.2515	**0.1846**	1.3076	**0.1929**	1.3534	**0.1997**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0708	7.6162	**0.5396**	1.0000	**0.0708**	8.2859	**0.5870**
2.1 < *n* < 3.6 m/s	0.0150	5.0037	**0.0752**	1.0000	**0.0150**	9.4706	**0.1423**
3.6 < *n* < 5.7 m/s	0.0150	4.2300	**0.0636**	3.1402	**0.0472**	10.0000	**0.1503**
5.7 < *n* < 8.8 m/s	0.0150	8.9969	**0.1352**	8.7496	**0.1315**	10.0000	**0.1503**
8.8 < *n* < 11.1 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0584	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0855	10.0000	**0.8550**	10.0000	**0.8550**	5.2526	**0.4491**
2.1 < *n* < 3.6 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	4.7725	**0.0717**
3.6 < *n* < 5.7 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	6.2921	**0.0946**
5.7 < *n* < 8.8 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	9.0619	**0.1362**
8.8 < *n* < 11.1 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0855	10.0000	**0.8550**	10.0000	**0.8550**	5.3185	**0.4547**
2.1 < *n* < 3.6 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	7.9022	**0.1188**
3.6 < *n* < 5.7 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	8.8893	**0.1336**
5.7 < *n* < 8.8 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	9.0000	**0.1353**
8.8 < *n* < 11.1 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.1014	1.0000	**0.1014**	3.6211	**0.3672**	10.0000	**1.0140**
2.1 < *n* < 3.6 m/s	0.0150	6.5955	**0.0991**	7.8258	**0.1176**	10.0000	**0.1503**
3.6 < *n* < 5.7 m/s	0.0150	9.6440	**0.1450**	9.7330	**0.1463**	10.0000	**0.1503**
5.7 < *n* < 8.8 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
8.8 < *n* < 11.1 m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Aggregated Utility Score		-	**6.0838**	-	**5.6020**	-	**6.1351**

Table 282 (Cont'd). Iterative Approach: 2nd Iteration: Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 7		Loc. 1A		Loc. 1-Off	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0150	2.3802	**0.0358**	10.0000	**0.1503**	1.2373	**0.0186**
Distance from LTP	0.1475	1.5254	**0.2251**	2.5952	**0.3829**	7.0609	**1.0418**
Distance from 5-Off	0.0155	9.0229	**0.1399**	3.3056	**0.0513**	4.5272	**0.0702**
Distance from 6-Off	0.0155	8.3780	**0.1299**	4.4731	**0.0694**	1.0000	**0.0155**
Distance form 4-Off	0.0150	5.7730	**0.0868**	6.8946	**0.1036**	5.0335	**0.0757**
Elevation	0.1475	1.4400	**0.2125**	2.4000	**0.3541**	10.0000	**1.4754**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	0.0708	8.3917	**0.5945**	8.8382	**0.6262**	9.3733	**0.6641**
$2.1 < n < 3.6$ m/s	0.0150	5.3676	**0.0807**	3.2279	**0.0485**	8.2132	**0.1234**
$3.6 < n < 5.7$ m/s	0.0150	4.0418	**0.0608**	2.5836	**0.0388**	7.3345	**0.1102**
$5.7 < n < 8.8$ m/s	0.0150	7.2244	**0.1086**	3.5557	**0.0534**	6.3313	**0.0952**
$8.8 < n < 11.1$ m/s	0.0150	8.6567	**0.1301**	5.9030	**0.0887**	5.2985	**0.0796**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	7.2143	**0.1084**	5.2857	**0.0794**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0855	10.0000	**0.8550**	3.9072	**0.3341**	8.1211	**0.6943**
$2.1 < n < 3.6$ m/s	0.0150	10.0000	**0.1503**	1.0000	**0.0150**	8.2575	**0.1241**
$3.6 < n < 5.7$ m/s	0.0150	10.0000	**0.1503**	1.0000	**0.0150**	6.0969	**0.0916**
$5.7 < n < 8.8$ m/s	0.0150	10.0000	**0.1503**	4.0782	**0.0613**	1.0000	**0.0150**
$8.8 < n < 11.1$ m/s	0.0150	10.0000	**0.1503**	6.6038	**0.0993**	1.0000	**0.0150**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	1.0000	**0.0150**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0855	7.4961	**0.6409**	5.3185	**0.4547**	1.0000	**0.0855**
$2.1 < n < 3.6$ m/s	0.0150	6.2317	**0.0937**	7.9022	**0.1188**	1.0000	**0.0150**
$3.6 < n < 5.7$ m/s	0.0150	6.6471	**0.0999**	8.8893	**0.1336**	1.0000	**0.0150**
$5.7 < n < 8.8$ m/s	0.0150	8.2222	**0.1236**	9.0000	**0.1353**	4.9444	**0.0743**
$8.8 < n < 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	10.0000	**0.1503**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.1014	3.6211	**0.3672**	7.3711	**0.7474**	8.3376	**0.8454**
$2.1 < n < 3.6$ m/s	0.0150	7.8258	**0.1176**	9.6629	**0.1452**	5.7697	**0.0867**
$3.6 < n < 5.7$ m/s	0.0150	9.7330	**0.1463**	9.7775	**0.1470**	4.6044	**0.0692**
$5.7 < n < 8.8$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	3.6211	**0.0544**
$8.8 < n < 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	3.6000	**0.0541**
$n > 11.1$ m/s	0.0150	10.0000	**0.1503**	10.0000	**0.1503**	5.5000	**0.0827**
Aggregated Utility Score		-	**5.9020**	-	**5.3841**	-	**6.4873**

Table 282 (Cont'd). Iterative Approach: 2nd Iteration: Aggregated MAUT Utility Scores.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 2-Off		Loc. 3-Off		Loc. 16	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0150	1.0559	**0.0159**	1.0000	**0.0150**	1.1965	**0.0180**
Distance from LTP	0.1475	8.6165	**1.2713**	10.0000	**1.4754**	7.0687	**1.0429**
Distance from 5-Off	0.0155	6.5640	**0.1018**	10.0000	**0.1551**	1.0000	**0.0155**
Distance from 6-Off	0.0155	1.6342	**0.0253**	4.8168	**0.0747**	5.6153	**0.0871**
Distance form 4-Off	0.0150	3.7596	**0.0565**	1.0000	**0.0150**	10.0000	**0.1503**
Elevation	0.1475	2.4727	**0.3648**	1.0000	**0.1475**	1.0033	**0.1480**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	0.0708	9.3046	**0.6592**	10.0000	**0.7085**	9.2903	**0.6582**
2.1 < *n* < 3.6 m/s	0.0150	9.1066	**0.1369**	10.0000	**0.1503**	7.5404	**0.1133**
3.6 < *n* < 5.7 m/s	0.0150	6.9111	**0.1039**	8.4948	**0.1277**	5.1159	**0.0769**
5.7 < *n* < 8.8 m/s	0.0150	4.1053	**0.0617**	6.6611	**0.1001**	4.8885	**0.0735**
8.8 < *n* < 11.1 m/s	0.0150	1.0000	**0.0150**	4.5597	**0.0685**	6.7090	**0.1008**
***n* > 11.1 m/s**	0.0150	1.0000	**0.0150**	4.7857	**0.0719**	9.0714	**0.1363**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0855	8.1211	**0.6943**	8.1211	**0.6943**	1.0000	**0.0855**
2.1 < *n* < 3.6 m/s	0.0150	8.2575	**0.1241**	8.2575	**0.1241**	6.3713	**0.0958**
3.6 < *n* < 5.7 m/s	0.0150	6.0969	**0.0916**	6.0969	**0.0916**	9.6327	**0.1448**
5.7 < *n* < 8.8 m/s	0.0150	1.0000	**0.0150**	1.0000	**0.0150**	10.0000	**0.1503**
8.8 < *n* < 11.1 m/s	0.0150	1.0000	**0.0150**	1.0000	**0.0150**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	1.0000	**0.0150**	1.0000	**0.0150**	10.0000	**0.1503**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0855	8.6828	**0.7424**	8.5483	**0.7309**	5.2533	**0.4491**
2.1 < *n* < 3.6 m/s	0.0150	8.3295	**0.1252**	6.3353	**0.0952**	7.3842	**0.1110**
3.6 < *n* < 5.7 m/s	0.0150	6.8962	**0.1037**	6.4706	**0.0973**	9.6678	**0.1453**
5.7 < *n* < 8.8 m/s	0.0150	1.0000	**0.0150**	1.0000	**0.0150**	10.0000	**0.1503**
8.8 < *n* < 11.1 m/s	0.0150	1.0000	**0.0150**	2.8000	**0.0421**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	1.0000	**0.0150**	2.3846	**0.0358**	10.0000	**0.1503**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.1014	8.3376	**0.8454**	6.6753	**0.6769**	10.0000	**1.0140**
2.1 < *n* < 3.6 m/s	0.0150	5.2303	**0.0786**	1.0000	**0.0150**	10.0000	**0.1503**
3.6 < *n* < 5.7 m/s	0.0150	6.4067	**0.0963**	1.0000	**0.0150**	10.0000	**0.1503**
5.7 < *n* < 8.8 m/s	0.0150	7.3789	**0.1109**	1.0000	**0.0150**	10.0000	**0.1503**
8.8 < *n* < 11.1 m/s	0.0150	7.4000	**0.1112**	1.0000	**0.0150**	10.0000	**0.1503**
***n* > 11.1 m/s**	0.0150	5.5000	**0.0827**	1.0000	**0.0150**	10.0000	**0.1503**
Aggregated Utility Score		-	**6.1239**	-	**5.8333**	-	**6.3197**

Table 284. Iterative Approach: Summary of Aggregated Weighted Marginal Utility Scores for Each Alternative (2nd Iteration).

Decision Problem Alternative	Aggregated Weighted Utility Score
Location 1	4.7342
Location 2	5.5846
Location 3	5.3491
Location 4	6.0838
Location 5	5.6020
Location 6	6.1351
Location 7	5.9020
Location 1A	5.3841
Location 1-Off	**6.4873**
Location 2-Off	6.1239
Location 3-Off	5.8333
Location 16	6.3197

Table 285 presents the results of the sensitivity analysis done for the second iteration of the MAUT analysis as part of the Iterative Approach. Like the previous sensitivity analyses done in this dissertation, manipulating each of the influencers to various values has been performed, and the corresponding effect on the outcomes (*i.e.,* the alternatives ranking) is presented.

Table 285. Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

	As-Is				What-If Scenario I			
	What Changed? Nothing.				What Changed? *All Criteria Weighting Factors Equalized.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0150	1st	Loc. 1-Off	6.4873	0.0333	1st	Loc. 4	8.1338
Distance, LTP	0.1475	2nd	Loc. 16	6.3197	0.0333	2nd	Loc. 6	8.0897
Distance, 5-Off	0.0155	3rd	Loc. 6	6.1351	0.0333	3rd	Loc. 5	7.7846
Distance, 6-Off	0.0155	4th	Loc. 2-Off	6.1239	0.0333	4th	Loc. 7	7.7326
Distance, 4-Off	0.0150	5th	Loc. 4	6.0838	0.0333	5th	Loc. 16	7.5936
Elevation	0.1475	6th	Loc. 7	5.9020	0.0333	6th	Loc. 1A	6.5167
W.E., LTP, *n*-Cat I	0.0708	7th	Loc. 3-Off	5.8333	0.0333	7th	Loc. 2	6.4474
W.E., LTP, *n*-Cat II	0.0150	8th	Loc. 5	5.6020	0.0333	8th	Loc. 3	6.1792
W.E., LTP, *n*-Cat III	0.0150	9th	Loc. 2	5.5846	0.0333	9th	Loc. 1	5.7873
W.E., LTP, *n*-Cat IV	0.0150	10th	Loc. 1A	5.3841	0.0333	10th	Loc. 1-Off	5.1849
W.E., LTP, *n*-Cat V	0.0150	11th	Loc. 3	5.3491	0.0333	11th	Loc. 2-Off	4.9389
W.E., LTP, *n*-Cat VI	0.0150	12th	Loc. 1	4.7342	0.0333	12th	Loc. 3-Off	4.5669
W.E., 5-Off, *n*-Cat I	0.0855				0.0333			
W.E., 5-Off, *n*-Cat II	0.0150				0.0333			
W.E., 5-Off, *n*-Cat III	0.0150				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 5-Off, *n*-Cat V	0.0150				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0150				0.0333			
W.E., 6-Off, *n*-Cat I	0.0855				0.0333			
W.E., 6-Off, *n*-Cat II	0.0150				0.0333			
W.E., 6-Off, *n*-Cat III	0.0150				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 6-Off, *n*-Cat V	0.0150				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0150				0.0333			
W.E., 4-Off, *n*-Cat I	0.1014				0.0333			
W.E., 4-Off, *n*-Cat II	0.0150				0.0333			
W.E., 4-Off, *n*-Cat III	0.0150				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0150				0.0333			
W.E., 4-Off, *n*-Cat V	0.0150				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0150				0.0333			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

	What-If Scenario II What Changed? *All Wind-Related Weighting Factors Reduced 10% from Original "As-Is" Values.*				**What-If Scenario III** What Changed? *All Wind-Related Weighting Factors Reduced 20% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0161	1st	Loc. 1-Off	6.5287	0.0173	1st	Loc. 1	4.5073
Distance, LTP	0.1577	2nd	Loc. 16	6.2354	0.1693	2nd	Loc. 3	5.1668
Distance, 5-Off	0.0166	3rd	Loc. 2-Off	6.0870	0.0178	3rd	Loc. 1A	5.1991
Distance, 6-Off	0.0166	4th	Loc. 6	5.9917	0.0178	4th	Loc. 2	5.3112
Distance, 4-Off	0.0161	5th	Loc. 4	5.9548	0.0173	5th	Loc. 5	5.3142
Elevation	0.1577	6th	Loc. 3-Off	5.8124	0.1693	6th	Loc. 7	5.6100
W.E., LTP, *n*-Cat I	0.0682	7th	Loc. 7	5.7660	0.0651	7th	Loc. 3-Off	5.7885
W.E., LTP, *n*-Cat II	0.0145	8th	Loc. 5	5.4680	0.0138	8th	Loc. 4	5.8068
W.E., LTP, *n*-Cat III	0.0145	9th	Loc. 2	5.4573	0.0138	9th	Loc. 6	5.8272
W.E., LTP, *n*-Cat IV	0.0145	10th	Loc. 1A	5.2980	0.0138	10th	Loc. 2-Off	6.0446
W.E., LTP, *n*-Cat V	0.0145	11th	Loc. 3	5.2642	0.0138	11th	Loc. 16	6.1386
W.E., LTP, *n*-Cat VI	0.0145	12th	Loc. 1	4.6286	0.0138	12th	Loc. 1-Off	6.5761
W.E., 5-Off, *n*-Cat I	0.0822				0.0785			
W.E., 5-Off, *n*-Cat II	0.0145				0.0138			
W.E., 5-Off, *n*-Cat III	0.0145				0.0138			
W.E., 5-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 5-Off, *n*-Cat V	0.0145				0.0138			
W.E., 5-Off, *n*-Cat VI	0.0145				0.0138			
W.E., 6-Off, *n*-Cat I	0.0822				0.0785			
W.E., 6-Off, *n*-Cat II	0.0145				0.0138			
W.E., 6-Off, *n*-Cat III	0.0145				0.0138			
W.E., 6-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 6-Off, *n*-Cat V	0.0145				0.0138			
W.E., 6-Off, *n*-Cat VI	0.0145				0.0138			
W.E., 4-Off, *n*-Cat I	0.0975				0.0931			
W.E., 4-Off, *n*-Cat II	0.0145				0.0138			
W.E., 4-Off, *n*-Cat III	0.0145				0.0138			
W.E., 4-Off, *n*-Cat IV	0.0145				0.0138			
W.E., 4-Off, *n*-Cat V	0.0145				0.0138			
W.E., 4-Off, *n*-Cat VI	0.0145				0.0138			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

	What-If Scenario IV				**What-If Scenario V**			
	What Changed? ***All Wind-Related Weighting Factors Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related Weighting Factors Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0222	1st	Loc. 1-Off	6.7724	0.0153	1st	Loc. 1-Off	6.4927
Distance, LTP	0.2176	2nd	Loc. 2-Off	5.8692	0.1354	2nd	Loc. 16	6.3123
Distance, 5-Off	0.0229	3rd	Loc. 16	5.7379	0.0142	3rd	Loc. 6	6.1930
Distance, 6-Off	0.0229	4th	Loc. 3-Off	5.6896	0.0142	4th	Loc. 4	6.1265
Distance, 4-Off	0.0222	5th	Loc. 4	5.1941	0.0138	5th	Loc. 2-Off	6.0964
Elevation	0.2176	6th	Loc. 6	5.1461	0.1505	6th	Loc. 7	5.9592
W.E., LTP, *n*-Cat I	0.0522	7th	Loc. 7	4.9640	0.0722	7th	Loc. 3-Off	5.7730
W.E., LTP, *n*-Cat II	0.0111	8th	Loc. 1A	4.7898	0.0153	8th	Loc. 5	5.6585
W.E., LTP, *n*-Cat III	0.0111	9th	Loc. 3	4.7633	0.0153	9th	Loc. 2	5.6408
W.E., LTP, *n*-Cat IV	0.0111	10th	Loc. 2	4.7063	0.0153	10th	Loc. 1A	5.4285
W.E., LTP, *n*-Cat V	0.0111	11th	Loc. 5	4.6778	0.0153	11th	Loc. 3	5.3954
W.E., LTP, *n*-Cat VI	0.0111	12th	Loc. 1	4.0055	0.0153	12th	Loc. 1	4.7864
W.E., 5-Off, *n*-Cat I	0.0630				0.0872			
W.E., 5-Off, *n*-Cat II	0.0111				0.0153			
W.E., 5-Off, *n*-Cat III	0.0111				0.0153			
W.E., 5-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 5-Off, *n*-Cat V	0.0111				0.0153			
W.E., 5-Off, *n*-Cat VI	0.0111				0.0153			
W.E., 6-Off, *n*-Cat I	0.0630				0.0872			
W.E., 6-Off, *n*-Cat II	0.0111				0.0153			
W.E., 6-Off, *n*-Cat III	0.0111				0.0153			
W.E., 6-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 6-Off, *n*-Cat V	0.0111				0.0153			
W.E., 6-Off, *n*-Cat VI	0.0111				0.0153			
W.E., 4-Off, *n*-Cat I	0.0748				0.1034			
W.E., 4-Off, *n*-Cat II	0.0111				0.0153			
W.E., 4-Off, *n*-Cat III	0.0111				0.0153			
W.E., 4-Off, *n*-Cat IV	0.0111				0.0153			
W.E., 4-Off, *n*-Cat V	0.0111				0.0153			
W.E., 4-Off, *n*-Cat VI	0.0111				0.0153			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

Criteria	What-If Scenario VI — What Changed? *All Distance-Related Weighting Factors Reduced 20% from Original "As-Is" Values.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score	What-If Scenario VII — What Changed? *All Distance-Related Weighting Factors Reduced 50% from Original "As-Is" Values.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score
$C_{Rn\text{-}222}$	0.0156	1st	Loc. 1-Off	6.4983	0.0166	1st	Loc. 1-Off	6.5165
Distance, LTP	0.1228	2nd	Loc. 16	6.3047	0.0817	2nd	Loc. 6	6.4495
Distance, 5-Off	0.0129	3rd	Loc. 6	6.2532	0.0086	3rd	Loc. 4	6.3156
Distance, 6-Off	0.0129	4th	Loc. 4	6.1709	0.0086	4th	Loc. 16	6.2796
Distance, 4-Off	0.0125	5th	Loc. 2-Off	6.0679	0.0083	5th	Loc. 7	6.2125
Elevation	0.1535	6th	Loc. 7	6.0187	0.1633	6th	Loc. 2-Off	5.9748
W.E., LTP, *n*-Cat I	0.0737	7th	Loc. 5	5.7173	0.0784	7th	Loc. 5	5.9088
W.E., LTP, *n*-Cat II	0.0156	8th	Loc. 3-Off	5.7103	0.0166	8th	Loc. 2	5.8897
W.E., LTP, *n*-Cat III	0.0156	9th	Loc. 2	5.6993	0.0166	9th	Loc. 1A	5.6250
W.E., LTP, *n*-Cat IV	0.0156	10th	Loc. 1A	5.4747	0.0166	10th	Loc. 3	5.6003
W.E., LTP, *n*-Cat V	0.0156	11th	Loc. 3	5.4436	0.0166	11th	Loc. 3-Off	5.5061
W.E., LTP, *n*-Cat VI	0.0156	12th	Loc. 1	4.8408	0.0166	12th	Loc. 1	5.0178
W.E., 5-Off, *n*-Cat I	0.0889				0.0947			
W.E., 5-Off, *n*-Cat II	0.0156				0.0166			
W.E., 5-Off, *n*-Cat III	0.0156				0.0166			
W.E., 5-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 5-Off, *n*-Cat V	0.0156				0.0166			
W.E., 5-Off, *n*-Cat VI	0.0156				0.0166			
W.E., 6-Off, *n*-Cat I	0.0889				0.0947			
W.E., 6-Off, *n*-Cat II	0.0156				0.0166			
W.E., 6-Off, *n*-Cat III	0.0156				0.0166			
W.E., 6-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 6-Off, *n*-Cat V	0.0156				0.0166			
W.E., 6-Off, *n*-Cat VI	0.0156				0.0166			
W.E., 4-Off, *n*-Cat I	0.1055				0.1123			
W.E., 4-Off, *n*-Cat II	0.0156				0.0166			
W.E., 4-Off, *n*-Cat III	0.0156				0.0166			
W.E., 4-Off, *n*-Cat IV	0.0156				0.0166			
W.E., 4-Off, *n*-Cat V	0.0156				0.0166			
W.E., 4-Off, *n*-Cat VI	0.0156				0.0166			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

Criteria	What-If Scenario VIII — What Changed? *Elevation Weighting Factor Reduced 10% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score	What-If Scenario IX — What Changed? *Elevation Weighting Factor Reduced 20% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score
$C_{Rn\text{-}222}$	0.0153	1st	Loc. 1-Off	6.4347	0.0155	1st	Loc. 16	6.4814
Distance, LTP	0.1497	2nd	Loc. 16	6.3993	0.1520	2nd	Loc. 1-Off	6.3805
Distance, 5-Off	0.0157	3rd	Loc. 6	6.2067	0.0160	3rd	Loc. 6	6.2805
Distance, 6-Off	0.0157	4th	Loc. 2-Off	6.1786	0.0160	4th	Loc. 2-Off	6.2349
Distance, 4-Off	0.0153	5th	Loc. 4	6.1561	0.0155	5th	Loc. 4	6.2307
Elevation	0.1348	6th	Loc. 7	5.9688	0.1216	6th	Loc. 7	6.0377
W.E., LTP, *n*-Cat I	0.0719	7th	Loc. 3-Off	5.9056	0.0730	7th	Loc. 3-Off	5.9802
W.E., LTP, *n*-Cat II	0.0153	8th	Loc. 5	5.6663	0.0155	8th	Loc. 5	5.7325
W.E., LTP, *n*-Cat III	0.0153	9th	Loc. 2	5.6428	0.0155	9th	Loc. 2	5.7028
W.E., LTP, *n*-Cat IV	0.0153	10th	Loc. 1A	5.4288	0.0155	10th	Loc. 1A	5.4749
W.E., LTP, *n*-Cat V	0.0153	11th	Loc. 3	5.3779	0.0155	11th	Loc. 3	5.4075
W.E., LTP, *n*-Cat VI	0.0153	12th	Loc. 1	4.7773	0.0155	12th	Loc. 1	4.8218
W.E., 5-Off, *n*-Cat I	0.0868				0.0881			
W.E., 5-Off, *n*-Cat II	0.0153				0.0155			
W.E., 5-Off, *n*-Cat III	0.0153				0.0155			
W.E., 5-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 5-Off, *n*-Cat V	0.0153				0.0155			
W.E., 5-Off, *n*-Cat VI	0.0153				0.0155			
W.E., 6-Off, *n*-Cat I	0.0868				0.0881			
W.E., 6-Off, *n*-Cat II	0.0153				0.0155			
W.E., 6-Off, *n*-Cat III	0.0153				0.0155			
W.E., 6-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 6-Off, *n*-Cat V	0.0153				0.0155			
W.E., 6-Off, *n*-Cat VI	0.0153				0.0155			
W.E., 4-Off, *n*-Cat I	0.1029				0.1045			
W.E., 4-Off, *n*-Cat II	0.0153				0.0155			
W.E., 4-Off, *n*-Cat III	0.0153				0.0155			
W.E., 4-Off, *n*-Cat IV	0.0153				0.0155			
W.E., 4-Off, *n*-Cat V	0.0153				0.0155			
W.E., 4-Off, *n*-Cat VI	0.0153				0.0155			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

	What-If Scenario X				**What-If Scenario XI**			
	What Changed? ***Elevation Weighting Factor Reduced 50% from Original "As-Is" Value.***				**What Changed?** ***Measured C_{Rn-222} Weighting Factor Reduced 10% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
C_{Rn-222}	0.0162	1st	Loc. 16	6.7431	0.0135	1st	Loc. 1-Off	6.4952
Distance, LTP	0.1593	2nd	Loc. 6	6.5159	0.1478	2nd	Loc. 16	6.3274
Distance, 5-Off	0.0167	3rd	Loc. 4	6.4686	0.0155	3rd	Loc. 6	6.1419
Distance, 6-Off	0.0167	4th	Loc. 2-Off	6.4147	0.0155	4th	Loc. 2-Off	6.1315
Distance, 4-Off	0.0162	5th	Loc. 7	6.2574	0.0151	5th	Loc. 4	6.0913
Elevation	0.0796	6th	Loc. 3-Off	6.2182	0.1478	6th	Loc. 7	5.9073
W.E., LTP, *n*-Cat I	0.0765	7th	Loc. 1-Off	6.2076	0.0710	7th	Loc. 3-Off	5.8405
W.E., LTP, *n*-Cat II	0.0162	8th	Loc. 5	5.9440	0.0151	8th	Loc. 5	5.6085
W.E., LTP, *n*-Cat III	0.0162	9th	Loc. 2	5.8942	0.0151	9th	Loc. 2	5.5912
W.E., LTP, *n*-Cat IV	0.0162	10th	Loc. 1A	5.6218	0.0151	10th	Loc. 1A	5.3772
W.E., LTP, *n*-Cat V	0.0162	11th	Loc. 3	5.5021	0.0151	11th	Loc. 3	5.3549
W.E., LTP, *n*-Cat VI	0.0162	12th	Loc. 1	4.9638	0.0151	12th	Loc. 1	4.7392
W.E., 5-Off, *n*-Cat I	0.0923				0.0856			
W.E., 5-Off, *n*-Cat II	0.0162				0.0151			
W.E., 5-Off, *n*-Cat III	0.0162				0.0151			
W.E., 5-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 5-Off, *n*-Cat V	0.0162				0.0151			
W.E., 5-Off, *n*-Cat VI	0.0162				0.0151			
W.E., 6-Off, *n*-Cat I	0.0923				0.0856			
W.E., 6-Off, *n*-Cat II	0.0162				0.0151			
W.E., 6-Off, *n*-Cat III	0.0162				0.0151			
W.E., 6-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 6-Off, *n*-Cat V	0.0162				0.0151			
W.E., 6-Off, *n*-Cat VI	0.0162				0.0151			
W.E., 4-Off, *n*-Cat I	0.1095				0.1016			
W.E., 4-Off, *n*-Cat II	0.0162				0.0151			
W.E., 4-Off, *n*-Cat III	0.0162				0.0151			
W.E., 4-Off, *n*-Cat IV	0.0162				0.0151			
W.E., 4-Off, *n*-Cat V	0.0162				0.0151			
W.E., 4-Off, *n*-Cat VI	0.0162				0.0151			

Table 284 (Cont'd). Sensitivity Analysis for 2nd MAUT Model Run (Iterative Approach).

Criteria	What-If Scenario XII — What Changed? *Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 20% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score	What-If Scenario XIII — What Changed? *Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 50% from Original "As-Is" Value.* Criteria Weighting Factor	Alternatives Ranking: Rank	Alternative	Aggregated Weighted Utility Score
$C_{Rn\text{-}222}$	0.0121	1st	Loc. 1-Off	6.5032	0.0076	1st	Loc. 1-Off	6.5271
Distance, LTP	0.1480	2nd	Loc. 16	6.3352	0.1487	2nd	Loc. 16	6.3585
Distance, 5-Off	0.0156	3rd	Loc. 6	6.1487	0.0156	3rd	Loc. 6	6.1692
Distance, 6-Off	0.0156	4th	Loc. 2-Off	6.1392	0.0156	4th	Loc. 2-Off	6.1623
Distance, 4-Off	0.0151	5th	Loc. 4	6.0988	0.0151	5th	Loc. 4	6.1215
Elevation	0.1480	6th	Loc. 7	5.9126	0.1487	6th	Loc. 7	5.9287
W.E., LTP, *n*-Cat I	0.0711	7th	Loc. 3-Off	5.8478	0.0714	7th	Loc. 3-Off	5.8699
W.E., LTP, *n*-Cat II	0.0151	8th	Loc. 5	5.6151	0.0151	8th	Loc. 5	5.6350
W.E., LTP, *n*-Cat III	0.0151	9th	Loc. 2	5.5979	0.0151	9th	Loc. 2	5.6180
W.E., LTP, *n*-Cat IV	0.0151	10th	Loc. 1A	5.3702	0.0151	10th	Loc. 3	5.3780
W.E., LTP, *n*-Cat V	0.0151	11th	Loc. 3	5.3606	0.0151	11th	Loc. 1A	5.3492
W.E., LTP, *n*-Cat VI	0.0151	12th	Loc. 1	4.7443	0.0151	12th	Loc. 1	4.7596
W.E., 5-Off, *n*-Cat I	0.0858				0.0861			
W.E., 5-Off, *n*-Cat II	0.0151				0.0151			
W.E., 5-Off, *n*-Cat III	0.0151				0.0151			
W.E., 5-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 5-Off, *n*-Cat V	0.0151				0.0151			
W.E., 5-Off, *n*-Cat VI	0.0151				0.0151			
W.E., 6-Off, *n*-Cat I	0.0858				0.0861			
W.E., 6-Off, *n*-Cat II	0.0151				0.0151			
W.E., 6-Off, *n*-Cat III	0.0151				0.0151			
W.E., 6-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 6-Off, *n*-Cat V	0.0151				0.0151			
W.E., 6-Off, *n*-Cat VI	0.0151				0.0151			
W.E., 4-Off, *n*-Cat I	0.1017				0.1022			
W.E., 4-Off, *n*-Cat II	0.0151				0.0151			
W.E., 4-Off, *n*-Cat III	0.0151				0.0151			
W.E., 4-Off, *n*-Cat IV	0.0151				0.0151			
W.E., 4-Off, *n*-Cat V	0.0151				0.0151			
W.E., 4-Off, *n*-Cat VI	0.0151				0.0151			

The sensitivity analysis above reveals that Locations 3, 1A and 1 are the least preferred alternatives in nearly all the what-if scenarios presented. Similarly, Locations 1-Off, 16, and 6 are often ranked as the most preferred alternatives. The sensitivity analysis reveals that it would require significant bias from one or more criteria to alter the established relationship preferences.

Via the process prescribed by the Iterative Approach, it can now be seen that upon the second iteration, the rational choice indicated by the MAUT agrees with those indicated by the AHP- and ANP-style portions of the approach. Since all the analyses agree, the iterative process is now complete. In the event that use of the PVs obtained from the model synthesis of the AHP-style analysis failed to produce agreement in the second MAUT iteration, use of the global priorities from the model synthesis of the ANP-style analysis would have been pursued. In the event both of these options failed, examination of the MU values (and the derived PVs obtained from the AHP-style pairwise comparisons) would be necessary. As explained in Section 3.3, if agreement cannot be achieved after several iterations, there is likely a fundamental issue with the problem statement or the manner in which value judgments were made.

3.10. MAUT—ANP Hybrid: Testing the ANP-Weighting Approach

The final hybrid to be discussed in this dissertation is the ANP-Weighting Approach. As alluded to in Figure 4, Table 1, and as further explained in Section 3.3, this hybrid approach is intended to be the most streamlined and simplest of the three. As usual, the first step in the ANP-Weighting Approach is to create a pictorial representation of the decision-making process. Such a picture is presented in Figure 62 below.

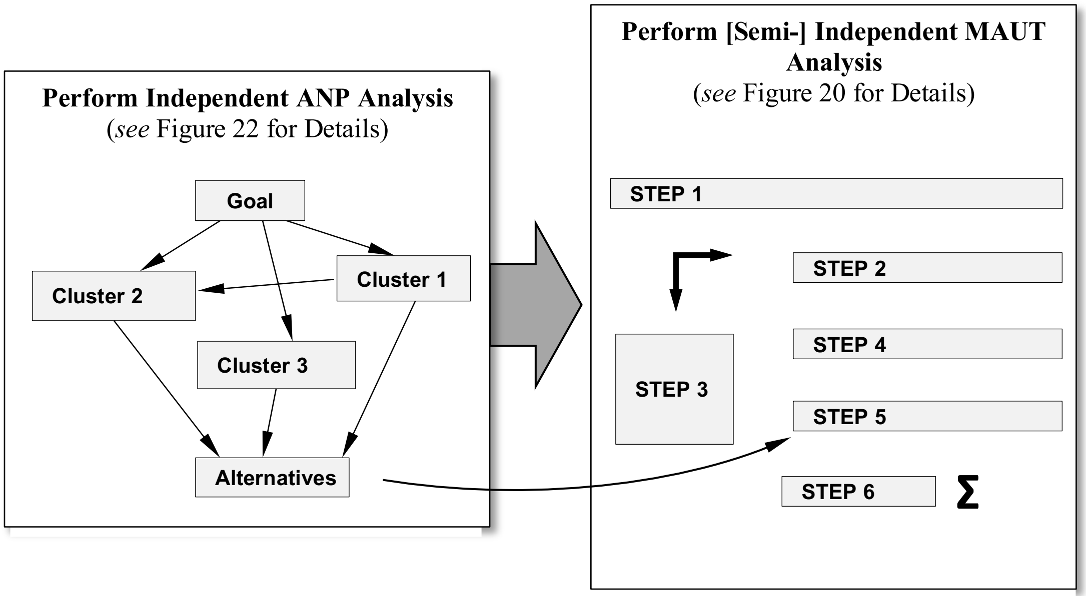

Figure 63. ANP-Weighting Decision Model for Dissertation Problem Statement.

As indicated in Figure 63, the MAUT analysis is considered to be only semi-independent. The reason for this distinction is the fact that the ANP priorities are used as direct inputs to become the MAUT's weighting values, but the rest of the underlying data for the MAUT (*e.g.,* the development of MU values and other utility judgments) remains the same.

Testing of the ANP-Weighting Approach begins with a completed ANP analysis of a decision problem. This has been done. Using the global priorities obtained from the initial ANP analysis, a slight modification is required in order to convert them into usable inputs as MAUT weighting factors. The modification is required because SuperDecisions gives the global priorities for the entire arrangement of nodes, which includes the elements in the Alternatives cluster (*see* Table 166). Therefore, the set of priorities pertaining to the criteria must be re-grouped and normalized; in keeping with the normalization constraint principle (*see* Eq. (**3**), the sum of the factors applied must equal 1. Re-normalizing the elements in the criteria clusters can be done simply by dividing each criterion of interest by the sum of all the criteria of interest.[105] The results of this yield the MAUT weighting factors that will be used to test the ANP-Weighting Approach and are given below in Table 286.

Table 286. ANP-Weighting Approach: Conversion of ANP Global Priorities for use in MAUT Analysis.

Cluster Name	**Name**	**Normalized By Cluster, $\Sigma_{Cluster} = 1$**	**Limited Value, $\Sigma_{Total} = 1$**	**PV Weight Coefficient for MAUT Input**	**Resulting PV Weight for MAUT Input**	**Normally Constrained Value $\Sigma_{Group} = 1$**
Alternatives	Loc. 1	0.0581	0.0233	N/A	N/A	N/A
	Loc. 1-Off	0.1815	0.0729	N/A	N/A	N/A
	Loc. 1A	0.0667	0.0268	N/A	N/A	N/A
	Loc. 2	0.0633	0.0254	N/A	N/A	N/A
	Loc. 2-Off	0.0897	0.0360	N/A	N/A	N/A
	Loc. 3	0.0703	0.0282	N/A	N/A	N/A
	Loc. 3-Off	0.0891	0.0358	N/A	N/A	N/A
	Loc. 4	0.0755	0.0303	N/A	N/A	N/A
	Loc. 5	0.0717	0.0288	N/A	N/A	N/A
	Loc. 6	0.0773	0.0311	N/A	N/A	N/A
	Loc. 7	0.0719	0.0289	N/A	N/A	N/A
	Loc. 16	0.0849	0.0341	N/A	N/A	N/A
Distance	Distance, 4-Off	0.1238	0.0174	1.0000	0.0174	**0.0726**
	Distance, 5-Off	0.2324	0.0326	1.0000	0.0326	**0.1363**
	Distance, 6-Off	0.2759	0.0387	1.0000	0.0387	**0.1619**
	Distance, LTP	0.3680	0.0516	1.0000	0.0516	**0.2159**
$C_{Rn\text{-}222}$	Meas. $C_{Rn\text{-}222}$	1.0000	0.0153	1.0000	0.0153	**0.0640**
Elev.	Elevation	1.0000	0.0702	1.0000	0.0702	**0.2936**

[105] Due to the fact that the initial ANP analysis accounted for the relationships between Windward Exposure from an Anthropogenic Source as a separate cluster from Windward Exposure from an Anthropogenic Source as a Function of Wind Speed [number of hours per *n*-Category], whereas the former represents a parent relationship to the latter, the calculated global PV values for each W. Exp. from an Anthropogenic Source criteria were multiplied by each global PV value of its corresponding node in the W. Exp. *f* (*n*-Cat). The multiplication is necessary to properly account for the impact that wind-related criteria have on the normally constrained sum of all criteria, *esp.* when used as inputs to the MAUT analysis.

Table 285 (Cont'd). ANP-Weighting Approach: Conversion of ANP Global Priorities for use in MAUT Analysis.

Cluster Name	Name	Normalized By Cluster, $\Sigma_{Cluster} = 1$	Limited Value, $\Sigma_{Total} = 1$	PV Weight Coefficient for MAUT Input	Resulting PV Weight for MAUT Input	Normally Constrained Value
Windward Exposure as a Function of Wind Speed	4-Off, n-Cat I	0.2579	0.0480	0.1032	0.0050	**0.0207**
	4-Off, n-Cat II	0.1439	0.0268	0.1032	0.0028	**0.0116**
	4-Off, n-Cat III	0.0766	0.0143	0.1032	0.0015	**0.0062**
	4-Off, n-Cat IV	0.0442	0.0082	0.1032	0.0009	**0.0036**
	4-Off, n-Cat V	0.0178	0.0033	0.1032	0.0003	**0.0014**
	4-Off, n-Cat VI	0.0139	0.0026	0.1032	0.0003	**0.0011**
	5-Off, n-Cat I	0.0891	0.0166	0.0354	0.0006	**0.0025**
	5-Off, n-Cat II	0.0496	0.0092	0.0354	0.0003	**0.0014**
	5-Off, n-Cat III	0.0264	0.0049	0.0354	0.0002	**7.29 x 10^{-4}**
	5-Off, n-Cat IV	0.0139	0.0026	0.0354	0.0001	**3.85 x 10^{-4}**
	5-Off, n-Cat V	0.0062	0.0011	0.0354	0.0000	**1.70 x 10^{-4}**
	5-Off, n-Cat VI	0.0050	0.0009	0.0354	0.0000	**1.39 x 10^{-4}**
	6-Off, n-Cat I	0.0891	0.0166	0.0354	0.0006	**0.0025**
	6-Off, n-Cat II	0.0496	0.0092	0.0354	0.0003	**0.0014**
	6-Off, n-Cat III	0.0264	0.0049	0.0354	0.0002	**7.29 x 10^{-4}**
	6-Off, n-Cat IV	0.0139	0.0026	0.0354	0.0001	**3.85 x 10^{-4}**
	6-Off, n-Cat V	0.0062	0.0011	0.0354	0.0000	**1.70 x 10^{-4}**
	6-Off, n-Cat VI	0.0050	0.0009	0.0354	0.0000	**1.39 x 10^{-4}**
	LTP, n-Cat I	0.0306	0.0057	0.0122	0.0001	**2.90 x10^{-4}**
	LTP, n-Cat II	0.0170	0.0032	0.0122	0.0000	**1.61 x10^{-4}**
	LTP, n-Cat III	0.0091	0.0017	0.0122	0.0000	**8.59 x 10^{-5}**
	LTP, n-Cat IV	0.0048	0.0009	0.0122	0.0000	**4.54 x 10^{-5}**
	LTP, n-Cat V	0.0021	0.0004	0.0122	0.0000	**2.00 x 10^{-5}**
	LTP, n-Cat VI	0.0017	0.0003	0.0122	0.0000	**1.63 x 10^{-5}**
	W. Exp., 4-Off	0.5543	0.1032	N/A	N/A	N/A
	W. Exp., 5-Off	0.1902	0.0354	N/A	N/A	N/A
	W. Exp., 6-Off	0.1902	0.0354	N/A	N/A	N/A
	W. Exp., LTP	0.0653	0.0122	N/A	N/A	N/A

As prescribed by the protocols established in Section 3.3, the next step in the ANP-Weighting Process is to create a MAUT model to process the decision problem. This has already been done. Using the initial MAUT model, but replacing the original weighting values with the values just calculated above in Table 286, the MAUT model has been recalculated and is presented below in Table 287; a summary of the aggregated global utility scores is subsequently given in Table 288.

Table 287. ANP-Weighting Approach: MAUT Analysis.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 1		Loc. 2		Loc. 3	
		MU	WMU	MU	WMU	MU	WMU
Meas. $C_{Rn\text{-}222}$	0.0640	1.3707	**0.0877**	1.1667	**0.0747**	1.5341	**0.0982**
Distance from LTP	0.2159	1.0057	**0.2171**	1.9028	**0.4108**	1.9190	**0.4143**
Distance from 5-Off	0.1363	4.6027	**0.6275**	6.1099	**0.8330**	8.0278	**1.0945**
Distance from 6-Off	0.1619	5.4160	**0.8768**	5.1406	**0.8323**	6.7575	**1.0940**
Distance form 4-Off	0.0726	6.6796	**0.4851**	4.9670	**0.3607**	4.6132	**0.3350**
Elevation	0.2936	1.8514	**0.5435**	1.6976	**0.4984**	3.4286	**1.0065**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	2.90×10^{-4}	8.1428	**0.0024**	9.3046	**0.0027**	8.0083	**0.0023**
$2.1 < n < 3.6$ m/s	1.61×10^{-4}	2.3346	**0.0004**	9.1066	**0.0015**	5.2794	**0.0009**
$3.6 < n < 5.7$ m/s	8.59×10^{-5}	1.0000	**0.0001**	6.9111	**0.0006**	2.5209	**0.0002**
$5.7 < n < 8.8$ m/s	4.54×10^{-5}	1.0000	**0.0000**	4.1053	**0.0002**	1.3298	**0.0001**
$8.8 < n < 11.1$ m/s	2.00×10^{-5}	2.2761	**0.0000**	1.0000	**0.0000**	1.5373	**0.0000**
$n > 11.1$ m/s	1.63×10^{-5}	3.4286	**0.0001**	1.0000	**0.0000**	5.3571	**0.0001**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0025	3.9072	**0.0096**	7.2474	**0.0178**	7.2474	**0.0178**
$2.1 < n < 3.6$ m/s	0.0014	1.0000	**0.0014**	4.9162	**0.0067**	4.9162	**0.0067**
$3.6 < n < 5.7$ m/s	7.29×10^{-4}	1.0000	**0.0007**	6.0969	**0.0044**	6.0969	**0.0044**
$5.7 < n < 8.8$ m/s	3.85×10^{-4}	4.0782	**0.0016**	5.2508	**0.0020**	5.2508	**0.0020**
$8.8 < n < 11.1$ m/s	1.70×10^{-4}	6.6038	**0.0011**	4.5660	**0.0008**	4.5660	**0.0008**
$n > 11.1$ m/s	1.39×10^{-4}	10.0000	**0.0014**	7.5250	**0.0010**	7.5250	**0.0010**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0025	5.3185	**0.0131**	7.4961	**0.0184**	8.1853	**0.0201**
$2.1 < n < 3.6$ m/s	0.0014	7.9022	**0.0108**	6.2317	**0.0085**	6.8532	**0.0094**
$3.6 < n < 5.7$ m/s	7.29×10^{-4}	8.8893	**0.0065**	6.6471	**0.0048**	5.4637	**0.0040**
$5.7 < n < 8.8$ m/s	3.85×10^{-4}	9.0000	**0.0035**	8.2222	**0.0032**	7.7778	**0.0030**
$8.8 < n < 11.1$ m/s	1.70×10^{-4}	10.0000	**0.0017**	10.0000	**0.0017**	10.0000	**0.0017**
$n > 11.1$ m/s	1.39×10^{-4}	10.0000	**0.0014**	10.0000	**0.0014**	10.0000	**0.0014**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.0207	7.3711	**0.1529**	7.3711	**0.1529**	3.6211	**0.0751**
$2.1 < n < 3.6$ m/s	0.0116	9.6629	**0.1118**	9.6629	**0.1118**	7.8258	**0.0905**
$3.6 < n < 5.7$ m/s	0.0062	9.7775	**0.0602**	9.7775	**0.0602**	9.7330	**0.0599**
$5.7 < n < 8.8$ m/s	0.0036	10.0000	**0.0356**	10.0000	**0.0356**	10.0000	**0.0356**
$8.8 < n < 11.1$ m/s	0.0014	10.0000	**0.0143**	10.0000	**0.0143**	10.0000	**0.0143**
$n > 11.1$ m/s	0.0011	10.0000	**0.0112**	10.0000	**0.0112**	10.0000	**0.0112**
Aggregated Utility Score		-	**3.2793**	-	**3.4715**	-	**4.4050**

Table 286 (Cont'd). ANP-Weighting Approach: MAUT Analysis.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 4		Loc. 5		Loc. 6	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0640	1.1078	**0.0709**	1.2373	**0.0792**	1.6256	**0.1040**
Distance from LTP	0.2159	2.4161	**0.5216**	1.0000	**0.2159**	1.7342	**0.3744**
Distance from 5-Off	0.1363	9.6630	**1.3174**	8.1455	**1.1105**	6.3883	**0.8710**
Distance from 6-Off	0.1619	10.0000	**1.6190**	8.9350	**1.4466**	8.5381	**1.3823**
Distance form 4-Off	0.0726	6.4887	**0.4712**	7.8420	**0.5695**	8.8056	**0.6394**
Elevation	0.2936	1.2515	**0.3674**	1.3076	**0.3839**	1.3534	**0.3973**
Windward Exp., LTP							
0.5 < n < 2.1 m/s	2.90×10^{-4}	7.6162	**0.0022**	1.0000	**0.0003**	8.2859	**0.0024**
2.1 < n < 3.6 m/s	1.61×10^{-4}	5.0037	**0.0008**	1.0000	**0.0002**	9.4706	**0.0015**
3.6 < n < 5.7 m/s	8.59×10^{-5}	4.2300	**0.0004**	3.1402	**0.0003**	10.0000	**0.0009**
5.7 < n < 8.8 m/s	4.54×10^{-5}	8.9969	**0.0004**	8.7496	**0.0004**	10.0000	**0.0005**
8.8 < n < 11.1 m/s	2.00×10^{-5}	10.0000	**0.0002**	10.0000	**0.0002**	10.0000	**0.0002**
n > 11.1 m/s	1.63×10^{-5}	10.0000	**0.0002**	10.0000	**0.0002**	10.0000	**0.0002**
Windward Exp., 5-Off							
0.5 < n < 2.1 m/s	0.0025	10.0000	**0.0246**	10.0000	**0.0246**	5.2526	**0.0129**
2.1 < n < 3.6 m/s	0.0014	10.0000	**0.0137**	10.0000	**0.0137**	4.7725	**0.0065**
3.6 < n < 5.7 m/s	7.29×10^{-4}	10.0000	**0.0073**	10.0000	**0.0073**	6.2921	**0.0046**
5.7 < n < 8.8 m/s	3.85×10^{-4}	10.0000	**0.0038**	10.0000	**0.0038**	9.0619	**0.0035**
8.8 < n < 11.1 m/s	1.70×10^{-4}	10.0000	**0.0017**	10.0000	**0.0017**	10.0000	**0.0017**
n > 11.1 m/s	1.39×10^{-4}	10.0000	**0.0014**	10.0000	**0.0014**	10.0000	**0.0014**
Windward Exp., 6-Off							
0.5 < n < 2.1 m/s	0.0025	10.0000	**0.0246**	10.0000	**0.0246**	5.3185	**0.0131**
2.1 < n < 3.6 m/s	0.0014	10.0000	**0.0137**	10.0000	**0.0137**	7.9022	**0.0108**
3.6 < n < 5.7 m/s	7.29×10^{-4}	10.0000	**0.0073**	10.0000	**0.0073**	8.8893	**0.0065**
5.7 < n < 8.8 m/s	3.85×10^{-4}	10.0000	**0.0038**	10.0000	**0.0038**	9.0000	**0.0035**
8.8 < n < 11.1 m/s	1.70×10^{-4}	10.0000	**0.0017**	10.0000	**0.0017**	10.0000	**0.0017**
n > 11.1 m/s	1.39×10^{-4}	10.0000	**0.0014**	10.0000	**0.0014**	10.0000	**0.0014**
Windward Exp., 4-Off							
0.5 < n < 2.1 m/s	0.0207	1.0000	**0.0207**	3.6211	**0.0751**	10.0000	**0.2074**
2.1 < n < 3.6 m/s	0.0116	6.5955	**0.0763**	7.8258	**0.0905**	10.0000	**0.1157**
3.6 < n < 5.7 m/s	0.0062	9.6440	**0.0594**	9.7330	**0.0599**	10.0000	**0.0616**
5.7 < n < 8.8 m/s	0.0036	10.0000	**0.0356**	10.0000	**0.0356**	10.0000	**0.0356**
8.8 < n < 11.1 m/s	0.0014	10.0000	**0.0143**	10.0000	**0.0143**	10.0000	**0.0143**
n > 11.1 m/s	0.0011	10.0000	**0.0112**	10.0000	**0.0112**	10.0000	**0.0112**
Aggregated Utility Score		-	**4.6940**	-	**4.1985**	-	**4.2872**

Table 286 (Cont'd). ANP-Weighting Approach: MAUT Analysis.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 7		Loc. 1A		Loc. 1-Off	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0640	2.3802	**0.1523**	10.0000	**0.6400**	1.2373	**0.0792**
Distance from LTP	0.2159	1.5254	**0.3293**	2.5952	**0.5603**	7.0609	**1.5244**
Distance from 5-Off	0.1363	9.0229	**1.2302**	3.3056	**0.4507**	4.5272	**0.6172**
Distance from 6-Off	0.1619	8.3780	**1.3564**	4.4731	**0.7242**	1.0000	**0.1619**
Distance form 4-Off	0.0726	5.7730	**0.4192**	6.8946	**0.5007**	5.0335	**0.3655**
Elevation	0.2936	1.4400	**0.4227**	2.4000	**0.7046**	10.0000	**2.9357**
Windward Exp., LTP							
0.5 < *n* < 2.1 m/s	2.90×10^{-4}	8.3917	**0.0024**	8.8382	**0.0026**	9.3733	**0.0027**
2.1 < *n* < 3.6 m/s	1.61×10^{-4}	5.3676	**0.0009**	3.2279	**0.0005**	8.2132	**0.0013**
3.6 < *n* < 5.7 m/s	8.59×10^{-5}	4.0418	**0.0003**	2.5836	**0.0002**	7.3345	**0.0006**
5.7 < *n* < 8.8 m/s	4.54×10^{-5}	7.2244	**0.0003**	3.5557	**0.0002**	6.3313	**0.0003**
8.8 < *n* < 11.1 m/s	2.00×10^{-5}	8.6567	**0.0002**	5.9030	**0.0001**	5.2985	**0.0001**
***n* > 11.1 m/s**	1.63×10^{-5}	10.0000	**0.0002**	7.2143	**0.0001**	5.2857	**0.0001**
Windward Exp., 5-Off							
0.5 < *n* < 2.1 m/s	0.0025	10.0000	**0.0246**	3.9072	**0.0096**	8.1211	**0.0200**
2.1 < *n* < 3.6 m/s	0.0014	10.0000	**0.0137**	1.0000	**0.0014**	8.2575	**0.0113**
3.6 < *n* < 5.7 m/s	7.29×10^{-4}	10.0000	**0.0073**	1.0000	**0.0007**	6.0969	**0.0044**
5.7 < *n* < 8.8 m/s	3.85×10^{-4}	10.0000	**0.0038**	4.0782	**0.0016**	1.0000	**0.0004**
8.8 < *n* < 11.1 m/s	1.70×10^{-4}	10.0000	**0.0017**	6.6038	**0.0011**	1.0000	**0.0002**
***n* > 11.1 m/s**	1.39×10^{-4}	10.0000	**0.0014**	10.0000	**0.0014**	1.0000	**0.0001**
Windward Exp., 6-Off							
0.5 < *n* < 2.1 m/s	0.0025	7.4961	**0.0184**	5.3185	**0.0131**	1.0000	**0.0025**
2.1 < *n* < 3.6 m/s	0.0014	6.2317	**0.0085**	7.9022	**0.0108**	1.0000	**0.0014**
3.6 < *n* < 5.7 m/s	7.29×10^{-4}	6.6471	**0.0048**	8.8893	**0.0065**	1.0000	**0.0007**
5.7 < *n* < 8.8 m/s	3.85×10^{-4}	8.2222	**0.0032**	9.0000	**0.0035**	4.9444	**0.0019**
8.8 < *n* < 11.1 m/s	1.70×10^{-4}	10.0000	**0.0017**	10.0000	**0.0017**	10.0000	**0.0017**
***n* > 11.1 m/s**	1.39×10^{-4}	10.0000	**0.0014**	10.0000	**0.0014**	10.0000	**0.0014**
Windward Exp., 4-Off							
0.5 < *n* < 2.1 m/s	0.0207	3.6211	**0.0751**	7.3711	**0.1529**	8.3376	**0.1729**
2.1 < *n* < 3.6 m/s	0.0116	7.8258	**0.0905**	9.6629	**0.1118**	5.7697	**0.0668**
3.6 < *n* < 5.7 m/s	0.0062	9.7330	**0.0599**	9.7775	**0.0602**	4.6044	**0.0283**
5.7 < *n* < 8.8 m/s	0.0036	10.0000	**0.0356**	10.0000	**0.0356**	3.6211	**0.0129**
8.8 < *n* < 11.1 m/s	0.0014	10.0000	**0.0143**	10.0000	**0.0143**	3.6000	**0.0051**
***n* > 11.1 m/s**	0.0011	10.0000	**0.0112**	10.0000	**0.0112**	5.5000	**0.0061**
Aggregated Utility Score		-	**4.2915**	-	**4.0227**	-	**6.0272**

Table 286 (Cont'd). ANP-Weighting Approach: MAUT Analysis.

Criteria	Normalized Weight ($\Sigma w_i = 1$)	Loc. 2-Off		Loc. 3-Off		Loc. 16	
		MU	WMU	MU	WMU	MU	WMU
Meas. C_{Rn-222}	0.0640	1.0559	**0.0676**	1.0000	**0.0640**	1.1965	**0.0766**
Distance from LTP	0.2159	8.6165	**1.8603**	10.0000	**2.1590**	7.0687	**1.5261**
Distance from 5-Off	0.1363	6.5640	**0.8949**	10.0000	**1.3634**	1.0000	**0.1363**
Distance from 6-Off	0.1619	1.6342	**0.2646**	4.8168	**0.7798**	5.6153	**0.9091**
Distance form 4-Off	0.0726	3.7596	**0.2730**	1.0000	**0.0726**	10.0000	**0.7262**
Elevation	0.2936	2.4727	**0.7259**	1.0000	**0.2936**	1.0033	**0.2945**
Windward Exp., LTP							
$0.5 < n < 2.1$ m/s	2.90×10^{-4}	9.3046	**0.0027**	10.0000	**0.0029**	9.2903	**0.0027**
$2.1 < n < 3.6$ m/s	1.61×10^{-4}	9.1066	**0.0015**	10.0000	**0.0016**	7.5404	**0.0012**
$3.6 < n < 5.7$ m/s	8.59×10^{-5}	6.9111	**0.0006**	8.4948	**0.0007**	5.1159	**0.0004**
$5.7 < n < 8.8$ m/s	4.54×10^{-5}	4.1053	**0.0002**	6.6611	**0.0003**	4.8885	**0.0002**
$8.8 < n < 11.1$ m/s	2.00×10^{-5}	1.0000	**0.0000**	4.5597	**0.0001**	6.7090	**0.0001**
$n > 11.1$ m/s	1.63×10^{-5}	1.0000	**0.0000**	4.7857	**0.0001**	9.0714	**0.0001**
Windward Exp., 5-Off							
$0.5 < n < 2.1$ m/s	0.0025	8.1211	**0.0200**	8.1211	**0.0200**	1.0000	**0.0025**
$2.1 < n < 3.6$ m/s	0.0014	8.2575	**0.0113**	8.2575	**0.0113**	6.3713	**0.0087**
$3.6 < n < 5.7$ m/s	7.29×10^{-4}	6.0969	**0.0044**	6.0969	**0.0044**	9.6327	**0.0070**
$5.7 < n < 8.8$ m/s	3.85×10^{-4}	1.0000	**0.0004**	1.0000	**0.0004**	10.0000	**0.0038**
$8.8 < n < 11.1$ m/s	1.70×10^{-4}	1.0000	**0.0002**	1.0000	**0.0002**	10.0000	**0.0017**
$n > 11.1$ m/s	1.39×10^{-4}	1.0000	**0.0001**	1.0000	**0.0001**	10.0000	**0.0014**
Windward Exp., 6-Off							
$0.5 < n < 2.1$ m/s	0.0025	8.6828	**0.0213**	8.5483	**0.0210**	5.2533	**0.0129**
$2.1 < n < 3.6$ m/s	0.0014	8.3295	**0.0114**	6.3353	**0.0087**	7.3842	**0.0101**
$3.6 < n < 5.7$ m/s	7.29×10^{-4}	6.8962	**0.0050**	6.4706	**0.0047**	9.6678	**0.0070**
$5.7 < n < 8.8$ m/s	3.85×10^{-4}	1.0000	**0.0004**	1.0000	**0.0004**	10.0000	**0.0038**
$8.8 < n < 11.1$ m/s	1.70×10^{-4}	1.0000	**0.0002**	2.8000	**0.0005**	10.0000	**0.0017**
$n > 11.1$ m/s	1.39×10^{-4}	1.0000	**0.0001**	2.3846	**0.0003**	10.0000	**0.0014**
Windward Exp., 4-Off							
$0.5 < n < 2.1$ m/s	0.0207	8.3376	**0.1729**	6.6753	**0.1384**	10.0000	**0.2074**
$2.1 < n < 3.6$ m/s	0.0116	5.2303	**0.0605**	1.0000	**0.0116**	10.0000	**0.1157**
$3.6 < n < 5.7$ m/s	0.0062	6.4067	**0.0394**	1.0000	**0.0062**	10.0000	**0.0616**
$5.7 < n < 8.8$ m/s	0.0036	7.3789	**0.0262**	1.0000	**0.0036**	10.0000	**0.0356**
$8.8 < n < 11.1$ m/s	0.0014	7.4000	**0.0106**	1.0000	**0.0014**	10.0000	**0.0143**
$n > 11.1$ m/s	0.0011	5.5000	**0.0061**	1.0000	**0.0011**	10.0000	**0.0112**
Aggregated Utility Score		-	**4.4819**	-	**4.9723**	-	**4.1815**

Table 288. ANP-Weighting Approach: Summary of Aggregated Weighted Marginal Utility Scores for Each Alternative.

Decision Problem Alternative	Aggregated Weighted Utility Score
Location 1	3.2793
Location 2	3.4715
Location 3	4.4050
Location 4	4.6940
Location 5	4.1985
Location 6	4.2872
Location 7	4.2915
Location 1A	4.0227
Location 1-Off	**6.0272**
Location 2-Off	4.4819
Location 3-Off	4.9723
Location 16	4.1815

Table 289 presents the results of the sensitivity analysis done for the MAUT analysis portion of the ANP-Weighting Approach. Like the previous sensitivity analyses done in this dissertation, manipulating each of the influencers to various values has been performed, and the corresponding effect on the outcomes (*i.e.,* the alternatives ranking) is presented.

Table 289. Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	As-Is				**What-If Scenario I**			
	What Changed? Nothing.				**What Changed?** ***All Criteria Weighting Factors Equalized.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0640	1st	Loc. 1-Off	6.0272	0.0333	1st	Loc. 4	8.1338
Distance, LTP	0.2159	2nd	Loc. 3-Off	4.9723	0.0333	2nd	Loc. 6	8.0897
Distance, 5-Off	0.1363	3rd	Loc. 4	4.6940	0.0333	3rd	Loc. 5	7.7846
Distance, 6-Off	0.1619	4th	Loc. 2-Off	4.4819	0.0333	4th	Loc. 7	7.7326
Distance, 4-Off	0.0726	5th	Loc. 3	4.4050	0.0333	5th	Loc. 16	7.5936
Elevation	0.2936	6th	Loc. 7	4.2915	0.0333	6th	Loc. 1A	6.5167
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 6	4.2872	0.0333	7th	Loc. 2	6.4474
W.E., LTP, *n*-Cat II	0.0002	8th	Loc. 5	4.1985	0.0333	8th	Loc. 3	6.1792
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 16	4.1815	0.0333	9th	Loc. 1	5.7873
W.E., LTP, *n*-Cat IV	0.0000	10th	Loc. 1A	4.0227	0.0333	10th	Loc. 1-Off	5.1849
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.4715	0.0333	11th	Loc. 2-Off	4.9389
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.2793	0.0333	12th	Loc. 3-Off	4.5669
W.E., 5-Off, *n*-Cat I	0.0025				0.0333			
W.E., 5-Off, *n*-Cat II	0.0014				0.0333			
W.E., 5-Off, *n*-Cat III	0.0007				0.0333			
W.E., 5-Off, *n*-Cat IV	0.0004				0.0333			
W.E., 5-Off, *n*-Cat V	0.0002				0.0333			
W.E., 5-Off, *n*-Cat VI	0.0001				0.0333			
W.E., 6-Off, *n*-Cat I	0.0025				0.0333			
W.E., 6-Off, *n*-Cat II	0.0014				0.0333			
W.E., 6-Off, *n*-Cat III	0.0007				0.0333			
W.E., 6-Off, *n*-Cat IV	0.0004				0.0333			
W.E., 6-Off, *n*-Cat V	0.0002				0.0333			
W.E., 6-Off, *n*-Cat VI	0.0001				0.0333			
W.E., 4-Off, *n*-Cat I	0.0207				0.0333			
W.E., 4-Off, *n*-Cat II	0.0116				0.0333			
W.E., 4-Off, *n*-Cat III	0.0062				0.0333			
W.E., 4-Off, *n*-Cat IV	0.0036				0.0333			
W.E., 4-Off, *n*-Cat V	0.0014				0.0333			
W.E., 4-Off, *n*-Cat VI	0.0011				0.0333			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario II				What-If Scenario III			
	What Changed? *All Wind-Related Weighting Factors Reduced 10% from Original "As-Is" Values.*				What Changed? *All Wind-Related Weighting Factors Reduced 20% from Original "As-Is" Values.*			
		Alternatives Ranking				Alternatives Ranking		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0644	1st	Loc. 1-Off	6.0264	0.0647	1st	Loc. 1-Off	6.0256
Distance, LTP	0.2171	2nd	Loc. 3-Off	4.9760	0.2183	2nd	Loc. 3-Off	4.9798
Distance, 5-Off	0.1371	3rd	Loc. 4	4.6875	0.1379	3rd	Loc. 4	4.6809
Distance, 6-Off	0.1628	4th	Loc. 2-Off	4.4672	0.1637	4th	Loc. 2-Off	4.4524
Distance, 4-Off	0.0730	5th	Loc. 3	4.3932	0.0734	5th	Loc. 3	4.3813
Elevation	0.2952	6th	Loc. 7	4.2772	0.2969	6th	Loc. 7	4.2627
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 6	4.2591	0.0002	7th	Loc. 6	4.2306
W.E., LTP, *n*-Cat II	0.0001	8th	Loc. 5	4.1825	0.0001	8th	Loc. 5	4.1663
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 16	4.1533	0.0001	9th	Loc. 16	4.1249
W.E., LTP, *n*-Cat IV	0.0000	10th	Loc. 1A	4.0007	0.0000	10th	Loc. 1A	3.9785
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.4445	0.0000	11th	Loc. 2	3.4172
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.2532	0.0000	12th	Loc. 1	3.2269
W.E., 5-Off, *n*-Cat I	0.0022				0.0020			
W.E., 5-Off, *n*-Cat II	0.0012				0.0011			
W.E., 5-Off, *n*-Cat III	0.0007				0.0006			
W.E., 5-Off, *n*-Cat IV	0.0003				0.0003			
W.E., 5-Off, *n*-Cat V	0.0002				0.0001			
W.E., 5-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 6-Off, *n*-Cat I	0.0022				0.0020			
W.E., 6-Off, *n*-Cat II	0.0012				0.0011			
W.E., 6-Off, *n*-Cat III	0.0007				0.0006			
W.E., 6-Off, *n*-Cat IV	0.0003				0.0003			
W.E., 6-Off, *n*-Cat V	0.0002				0.0001			
W.E., 6-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 4-Off, *n*-Cat I	0.0188				0.0168			
W.E., 4-Off, *n*-Cat II	0.0105				0.0094			
W.E., 4-Off, *n*-Cat III	0.0056				0.0050			
W.E., 4-Off, *n*-Cat IV	0.0032				0.0029			
W.E., 4-Off, *n*-Cat V	0.0013				0.0012			
W.E., 4-Off, *n*-Cat VI	0.0010				0.0009			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario IV				**What-If Scenario V**			
	What Changed? ***All Wind-Related Weighting Factors Reduced 50% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related Weighting Factors Reduced 10% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0658	1st	Loc. 1-Off	6.0232	0.0680	1st	Loc. 1-Off	6.1193
Distance, LTP	0.2221	2nd	Loc. 3-Off	4.9913	0.2064	2nd	Loc. 3-Off	4.8175
Distance, 5-Off	0.1402	3rd	Loc. 4	4.6605	0.1304	3rd	Loc. 4	4.5692
Distance, 6-Off	0.1665	4th	Loc. 2-Off	4.4068	0.1548	4th	Loc. 2-Off	4.4115
Distance, 4-Off	0.0747	5th	Loc. 3	4.3447	0.0694	5th	Loc. 3	4.3675
Elevation	0.3020	6th	Loc. 7	4.2183	0.3119	6th	Loc. 6	4.2074
W.E., LTP, *n*-Cat I	0.0001	7th	Loc. 6	4.1432	0.0003	7th	Loc. 7	4.2048
W.E., LTP, *n*-Cat II	0.0001	8th	Loc. 5	4.1166	0.0002	8th	Loc. 5	4.1051
W.E., LTP, *n*-Cat III	0.0000	9th	Loc. 16	4.0376	0.0001	9th	Loc. 16	4.0918
W.E., LTP, *n*-Cat IV	0.0000	10th	Loc. 1A	3.9104	0.0000	10th	Loc. 1A	4.0359
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.3334	0.0000	11th	Loc. 2	3.4290
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.1461	0.0000	12th	Loc. 1	3.2493
W.E., 5-Off, *n*-Cat I	0.0013				0.0026			
W.E., 5-Off, *n*-Cat II	0.0007				0.0015			
W.E., 5-Off, *n*-Cat III	0.0004				0.0008			
W.E., 5-Off, *n*-Cat IV	0.0002				0.0004			
W.E., 5-Off, *n*-Cat V	0.0001				0.0002			
W.E., 5-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 6-Off, *n*-Cat I	0.0013				0.0026			
W.E., 6-Off, *n*-Cat II	0.0007				0.0015			
W.E., 6-Off, *n*-Cat III	0.0004				0.0008			
W.E., 6-Off, *n*-Cat IV	0.0002				0.0004			
W.E., 6-Off, *n*-Cat V	0.0001				0.0002			
W.E., 6-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 4-Off, *n*-Cat I	0.0107				0.0220			
W.E., 4-Off, *n*-Cat II	0.0060				0.0123			
W.E., 4-Off, *n*-Cat III	0.0032				0.0065			
W.E., 4-Off, *n*-Cat IV	0.0018				0.0038			
W.E., 4-Off, *n*-Cat V	0.0007				0.0015			
W.E., 4-Off, *n*-Cat VI	0.0006				0.0012			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario VI				**What-If Scenario VII**			
	What Changed? ***All Distance-Related Weighting Factors Reduced 20% from Original "As-Is" Values.***				**What Changed?** ***All Distance-Related Weighting Factors Reduced 50% from Original "As-Is" Values.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0725	1st	Loc. 1-Off	6.2237	0.0906	1st	Loc. 1-Off	6.6409
Distance, LTP	0.1957	2nd	Loc. 3-Off	4.6421	0.1528	2nd	Loc. 3	4.1551
Distance, 5-Off	0.1236	3rd	Loc. 4	4.4278	0.0965	3rd	Loc. 1A	4.1107
Distance, 6-Off	0.1467	4th	Loc. 2-Off	4.3317	0.1146	4th	Loc. 2-Off	4.0128
Distance, 4-Off	0.0658	5th	Loc. 3	4.3250	0.0514	5th	Loc. 3-Off	3.9412
Elevation	0.3326	6th	Loc. 6	4.1169	0.4154	6th	Loc. 4	3.8626
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 7	4.1064	0.0004	7th	Loc. 6	3.7554
W.E., LTP, *n*-Cat II	0.0002	8th	Loc. 1A	4.0509	0.0002	8th	Loc. 7	3.7134
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 5	3.9993	0.0001	9th	Loc. 16	3.5841
W.E., LTP, *n*-Cat IV	0.0001	10th	Loc. 16	3.9902	0.0001	10th	Loc. 5	3.5765
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.3809	0.0000	11th	Loc. 2	3.1885
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.2153	0.0000	12th	Loc. 1	3.0794
W.E., 5-Off, *n*-Cat I	0.0028				0.0035			
W.E., 5-Off, *n*-Cat II	0.0016				0.0019			
W.E., 5-Off, *n*-Cat III	0.0008				0.0010			
W.E., 5-Off, *n*-Cat IV	0.0004				0.0005			
W.E., 5-Off, *n*-Cat V	0.0002				0.0002			
W.E., 5-Off, *n*-Cat VI	0.0002				0.0002			
W.E., 6-Off, *n*-Cat I	0.0028				0.0035			
W.E., 6-Off, *n*-Cat II	0.0016				0.0019			
W.E., 6-Off, *n*-Cat III	0.0008				0.0010			
W.E., 6-Off, *n*-Cat IV	0.0004				0.0005			
W.E., 6-Off, *n*-Cat V	0.0002				0.0002			
W.E., 6-Off, *n*-Cat VI	0.0002				0.0002			
W.E., 4-Off, *n*-Cat I	0.0235				0.0293			
W.E., 4-Off, *n*-Cat II	0.0131				0.0164			
W.E., 4-Off, *n*-Cat III	0.0070				0.0087			
W.E., 4-Off, *n*-Cat IV	0.0040				0.0050			
W.E., 4-Off, *n*-Cat V	0.0016				0.0020			
W.E., 4-Off, *n*-Cat VI	0.0013				0.0016			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario VIII				**What-If Scenario IX**			
	What Changed? ***Elevation Weighting Factor Reduced 10% from Original "As-Is" Value.***				**What Changed?** ***Elevation Weighting Factor Reduced 20% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0659	1st	Loc. 1-Off	5.9070	0.0680	1st	Loc. 1-Off	5.7794
Distance, LTP	0.2224	2nd	Loc. 3-Off	5.0925	0.2294	2nd	Loc. 3-Off	5.2201
Distance, 5-Off	0.1405	3rd	Loc. 4	4.7982	0.1448	3rd	Loc. 4	4.9088
Distance, 6-Off	0.1668	4th	Loc. 2-Off	4.5427	0.1720	4th	Loc. 2-Off	4.6072
Distance, 4-Off	0.0748	5th	Loc. 3	4.4346	0.0771	5th	Loc. 6	4.4702
Elevation	0.2722	6th	Loc. 7	4.3778	0.2495	6th	Loc. 7	4.4694
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 6	4.3760	0.0003	7th	Loc. 3	4.4659
W.E., LTP, *n*-Cat II	0.0002	8th	Loc. 5	4.2859	0.0002	8th	Loc. 16	4.3797
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 16	4.2776	0.0001	9th	Loc. 5	4.3788
W.E., LTP, *n*-Cat IV	0.0000	10th	Loc. 1A	4.0717	0.0000	10th	Loc. 1A	4.1239
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.5251	0.0000	11th	Loc. 2	3.5821
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.3225	0.0000	12th	Loc. 1	3.3683
W.E., 5-Off, *n*-Cat I	0.0025				0.0026			
W.E., 5-Off, *n*-Cat II	0.0014				0.0015			
W.E., 5-Off, *n*-Cat III	0.0008				0.0008			
W.E., 5-Off, *n*-Cat IV	0.0004				0.0004			
W.E., 5-Off, *n*-Cat V	0.0002				0.0002			
W.E., 5-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 6-Off, *n*-Cat I	0.0025				0.0026			
W.E., 6-Off, *n*-Cat II	0.0014				0.0015			
W.E., 6-Off, *n*-Cat III	0.0008				0.0008			
W.E., 6-Off, *n*-Cat IV	0.0004				0.0004			
W.E., 6-Off, *n*-Cat V	0.0002				0.0002			
W.E., 6-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 4-Off, *n*-Cat I	0.0214				0.0220			
W.E., 4-Off, *n*-Cat II	0.0119				0.0123			
W.E., 4-Off, *n*-Cat III	0.0063				0.0065			
W.E., 4-Off, *n*-Cat IV	0.0037				0.0038			
W.E., 4-Off, *n*-Cat V	0.0015				0.0015			
W.E., 4-Off, *n*-Cat VI	0.0011				0.0012			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario X				**What-If Scenario XI**			
	What Changed? ***Elevation Weighting Factor Reduced 50% from Original "As-Is" Value.***				**What Changed?** ***Measured C_{Rn-222} Weighting Factor Reduced 10% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
C_{Rn-222}	0.0750	1st	Loc. 3-Off	5.6557	0.0580	1st	Loc. 1-Off	6.0580
Distance, LTP	0.2530	2nd	Loc. 1-Off	5.3437	0.2173	2nd	Loc. 3-Off	4.9979
Distance, 5-Off	0.1598	3rd	Loc. 4	5.2863	0.1372	3rd	Loc. 4	4.7171
Distance, 6-Off	0.1898	4th	Loc. 2-Off	4.8276	0.1629	4th	Loc. 2-Off	4.5040
Distance, 4-Off	0.0851	5th	Loc. 6	4.7919	0.0731	5th	Loc. 3	4.4235
Elevation	0.1720	6th	Loc. 7	4.7821	0.2955	6th	Loc. 6	4.3044
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 16	4.7282	0.0003	7th	Loc. 7	4.3039
W.E., LTP, *n*-Cat II	0.0002	8th	Loc. 5	4.6958	0.0002	8th	Loc. 5	4.2176
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 3	4.5730	0.0001	9th	Loc. 16	4.2007
W.E., LTP, *n*-Cat IV	0.0001	10th	Loc. 1A	4.3018	0.0000	10th	Loc. 1A	3.9842
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.7767	0.0000	11th	Loc. 2	3.4863
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.5249	0.0000	12th	Loc. 1	3.2916
W.E., 5-Off, *n*-Cat I	0.0029				0.0025			
W.E., 5-Off, *n*-Cat II	0.0016				0.0014			
W.E., 5-Off, *n*-Cat III	0.0009				0.0007			
W.E., 5-Off, *n*-Cat IV	0.0005				0.0004			
W.E., 5-Off, *n*-Cat V	0.0002				0.0002			
W.E., 5-Off, *n*-Cat VI	0.0002				0.0001			
W.E., 6-Off, *n*-Cat I	0.0029				0.0025			
W.E., 6-Off, *n*-Cat II	0.0016				0.0014			
W.E., 6-Off, *n*-Cat III	0.0009				0.0007			
W.E., 6-Off, *n*-Cat IV	0.0005				0.0004			
W.E., 6-Off, *n*-Cat V	0.0002				0.0002			
W.E., 6-Off, *n*-Cat VI	0.0002				0.0001			
W.E., 4-Off, *n*-Cat I	0.0243				0.0209			
W.E., 4-Off, *n*-Cat II	0.0136				0.0116			
W.E., 4-Off, *n*-Cat III	0.0072				0.0062			
W.E., 4-Off, *n*-Cat IV	0.0042				0.0036			
W.E., 4-Off, *n*-Cat V	0.0017				0.0014			
W.E., 4-Off, *n*-Cat VI	0.0013				0.0011			

Table 288 (Cont'd). Sensitivity Analysis for ANP-Weighted MAUT Analysis.

	What-If Scenario XII				**What-If Scenario XIII**			
	What Changed? ***Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 20% from Original "As-Is" Value.***				**What Changed?** ***Measured $C_{Rn\text{-}222}$ Weighting Factor Reduced 50% from Original "As-Is" Value.***			
		Alternatives Ranking				**Alternatives Ranking**		
Criteria	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**	**Criteria Weighting Factor**	**Rank**	**Alternative**	**Aggregated Weighted Utility Score**
$C_{Rn\text{-}222}$	0.0519	1st	Loc. 1-Off	6.0893	0.0331	1st	Loc. 1-Off	6.1855
Distance, LTP	0.2187	2nd	Loc. 3-Off	5.0238	0.2230	2nd	Loc. 3-Off	5.1036
Distance, 5-Off	0.1381	3rd	Loc. 4	4.7405	0.1408	3rd	Loc. 4	4.8126
Distance, 6-Off	0.1640	4th	Loc. 2-Off	4.5263	0.1673	4th	Loc. 2-Off	4.5952
Distance, 4-Off	0.0736	5th	Loc. 3	4.4422	0.0750	5th	Loc. 3	4.4999
Elevation	0.2974	6th	Loc. 6	4.3217	0.3033	6th	Loc. 6	4.3752
W.E., LTP, *n*-Cat I	0.0003	7th	Loc. 7	4.3163	0.0003	7th	Loc. 7	4.3547
W.E., LTP, *n*-Cat II	0.0002	8th	Loc. 5	4.2369	0.0002	8th	Loc. 5	4.2964
W.E., LTP, *n*-Cat III	0.0001	9th	Loc. 16	4.2202	0.0001	9th	Loc. 16	4.2801
W.E., LTP, *n*-Cat IV	0.0000	10th	Loc. 1A	3.9452	0.0000	10th	Loc. 1A	3.8251
W.E., LTP, *n*-Cat V	0.0000	11th	Loc. 2	3.5014	0.0000	11th	Loc. 2	3.5477
W.E., LTP, *n*-Cat VI	0.0000	12th	Loc. 1	3.3040	0.0000	12th	Loc. 1	3.3424
W.E., 5-Off, *n*-Cat I	0.0025				0.0025			
W.E., 5-Off, *n*-Cat II	0.0014				0.0014			
W.E., 5-Off, *n*-Cat III	0.0007				0.0008			
W.E., 5-Off, *n*-Cat IV	0.0004				0.0004			
W.E., 5-Off, *n*-Cat V	0.0002				0.0002			
W.E., 5-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 6-Off, *n*-Cat I	0.0025				0.0025			
W.E., 6-Off, *n*-Cat II	0.0014				0.0014			
W.E., 6-Off, *n*-Cat III	0.0007				0.0008			
W.E., 6-Off, *n*-Cat IV	0.0004				0.0004			
W.E., 6-Off, *n*-Cat V	0.0002				0.0002			
W.E., 6-Off, *n*-Cat VI	0.0001				0.0001			
W.E., 4-Off, *n*-Cat I	0.0210				0.0214			
W.E., 4-Off, *n*-Cat II	0.0117				0.0120			
W.E., 4-Off, *n*-Cat III	0.0062				0.0064			
W.E., 4-Off, *n*-Cat IV	0.0036				0.0037			
W.E., 4-Off, *n*-Cat V	0.0014				0.0015			
W.E., 4-Off, *n*-Cat VI	0.0011				0.0012			

The sensitivity analysis above reveals that Locations 1 and 2 are the least preferred alternatives in nearly all the what-if scenarios presented. Similarly, Locations 1-Off and 3-Off are often ranked as the most preferred alternatives. The sensitivity analysis reveals that it would require significant bias from one or more criteria to alter the established relationship preferences.

As can be seen from Tables Table ***288*** and Table ***289*** above, the ANP-Weighting Process indicates Location 1-Off to be the most rational choice. Unlike the Validation and Iterative Approaches, the ANP-Weighting Approach is not iterative, rather, it is a straight through process and there is no mechanism to deal with conflicting results. In the ANP-Weighting Approach, the MAUT model is deemed to provide the final answer. This potential shortcoming will be discussed in the following chapters.

CHAPTER 4

RESULTS

4.1. Introduction

This dissertation is now at a point where results of the various MCDM models tested in the previous chapter can be analyzed. The first part of this chapter begins with a high-level summary of the results and simple comparisons, and then proceeds to more detailed comparisons. In some cases, the analyses reflected herein may become truncated because various models are being compared and contrasted and, in some cases, have altogether different structures. Such occurrences will be annotated.

4.2. Results of the MCDM Models and Combinational Hybrid Approaches

A high-level summary of the results from the various MCDM models is presented below in Table 290.

Table 290. High-Level Summary of Results.

MCDM Model Hybrid Approach	Clarification	Result (Most Rational Choice Indicated)
MAUT	Original, 1st Run	Location 6
AHP	Original, 1st Run	Location 1-Off
ANP	Original, 1st Run	Location 1-Off
MAUT (Validation A.)	Validation Run	Location 1-Off
AHP (Iterative A.)	1st Iteration (w/ Intolerable CR)	Location 1-Off
AHP (Iterative A.)	1st Iteration (w/ Corrected CR	Location 1-Off
ANP (Iterative A.)	1st Iteration	Location 1-Off
MAUT (Iterative A.)	2nd Iteration	Location 1-Off
MAUT (ANP-Weighting A.)	ANP-W.A. Run	Location 1-Off

What can be observed from Table 290 is that the only time a decision model revealed an answer other than Location 1-Off was after completion of the very first MAUT run, and was even adjusted during the validation approach. In every other instance, Location 1-Off was revealed to be the most rational choice. There are a few conclusions that can be drawn with respect to this progression. First, the fact that all but one of the modeled runs revealed the same result supports the use of common and consistent logic in developing utility functions and preference values for the MAUT and AHP/ANP analyses. Secondly, the fact that the very first modeled run (*i.e.,* the initial MAUT analysis) did *not* produce a result consistent with those of the other MCDMs, but upon re-consideration of the weighting values, subsequently did come into agreement with the other MCDMs, not only supports the value that the Validation, Iterative and ANP-Weighting Approaches offer but also further supports the notion that when common and consistent logic is used, similar results should occur. That is to say, the fact that the initial MAUT indicated Location 6 to be the most rational choice was only because a heavy-handed ascription of the weighting factors as made.

4.3. Data Analysis

A more detailed look at the results can now be made. The following tables are introduced to engender a meaningful discussion: Table 291 presents a juxtaposed comparison of all the results of the various MCDM models calculated in this dissertation; Table 292 presents a normalized juxtaposed comparison of the values presented in Table 291, along with the statistical calculations of mean, variance, and standard deviation; and Table 293 presents a juxtaposed comparison of the rankings of the alternatives derived from Table 291. Figure 64 graphically illustrates the statistical values calculated in Table 292.

Table 291. Direct Comparison of Results of MCDM Models and Hybrid Approaches.

Loc. ID	Model								
	MAUT (Initial)	AHP (Initial)	ANP (Initial)	MAUT (Validation Approach)	AHP (Iterative Approach w/ intolerable CR)	AHP (Iterative Approach w/ corrected CR)	ANP (Iterative Approach)	MAUT (Iterative Approach)	MAUT (ANP-Weighting Approach)
1	4.9967	0.0572	0.0581	4.8225	0.0565	0.0555	0.0528	4.7342	3.2793
2	6.1865	0.0627	0.0633	5.7229	0.0687	0.0651	0.0555	5.5846	3.4715
3	5.6835	0.0689	0.0703	5.4879	0.0642	0.0648	0.0609	5.3491	4.4050
4	6.7809	0.0742	0.0755	6.2371	0.0939	0.0917	0.0850	6.0838	4.6940
5	6.2458	0.0707	0.0717	5.6961	0.0874	0.0855	0.0799	5.6020	4.1985
6	6.8010	0.0780	0.0773	6.2167	0.0870	0.0849	0.0805	6.1351	4.2872
7	6.4918	0.0737	0.0719	6.0560	0.0807	0.0803	0.0758	5.9020	4.2915
1A	5.5010	0.0733	0.0667	5.3947	0.0646	0.0652	0.0625	5.3841	4.0227
1-Off	6.1260	0.1743	0.1815	6.4112	0.1143	0.1224	0.1357	6.4873	6.0272
2-Off	6.4210	0.0894	0.0897	6.2399	0.0873	0.0868	0.0909	6.1239	4.4819
3-Off	5.9925	0.0912	0.0891	6.0466	0.0980	0.1000	0.1158	5.8333	4.9723
16	6.7051	0.0864	0.0849	6.2274	0.0974	0.0978	0.1049	6.3197	4.1815

Table 292. Comparison of Normalized Results of MCDM Models and Hybrid Approaches.

Loc. ID	Model									Statistical Calculations		
	MAUT (Initial)	AHP (Initial)	ANP (Initial)	MAUT (Validation Approach)	AHP (Iterative Approach w/ intolerable CR)	AHP (Iterative Approach w/ corrected CR)	ANP (Iterative Approach)	MAUT (Iterative Approach)	MAUT (ANP-Weighting Approach)	Mean	Variance	Standard Deviation
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000
2	6.9347	1.4261	1.3799	6.1007	2.8997	2.2915	1.2986	5.3657	1.6295	3.2585	4.4976	2.1208
3	4.4257	1.9002	1.8874	4.7697	2.1990	2.2511	1.8849	4.1570	4.6870	3.1291	1.5658	1.2513
4	9.8996	2.3097	2.2687	9.0135	6.8235	5.8700	4.4940	7.9284	5.6337	6.0268	6.5154	2.5525
5	7.2307	2.0381	1.9887	5.9489	5.8114	5.0359	3.9403	5.4549	4.0107	4.6066	2.8103	1.6764
6	10.0000	2.5984	2.4022	8.8982	5.7491	4.9552	4.0054	8.1917	4.3012	5.6779	6.7559	2.5992
7	8.4575	2.2717	2.0048	7.9876	4.7682	4.3363	3.4973	6.9952	4.3154	4.9593	4.9424	2.2232
1A	3.5156	2.2421	1.6234	4.2414	2.2612	2.3049	2.0608	4.3367	3.4347	2.8912	0.8952	0.9461
1-Off	6.6330	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	9.6259	1.1197	1.0581
2-Off	8.1045	3.4744	3.3041	9.0296	5.7958	5.2108	5.1401	8.1344	4.9389	5.9036	3.8062	1.9510
3-Off	5.9670	3.6178	3.2633	7.9345	7.4619	6.9865	7.8404	6.6423	6.5451	6.2510	2.6164	1.6175
16	9.5217	3.2481	2.9563	8.9590	7.3685	6.6906	6.6612	9.1396	3.9548	6.5000	5.8414	2.4169

Table 293. Comparison of Rankings of Alternatives of MCDM Models and Hybrid Approaches.

	Model								
Loc. ID	**MAUT (Initial)**	**AHP (Initial)**	**ANP (Initial)**	**MAUT (Validation Approach)**	**AHP (Iterative Approach w/ intolerable CR)**	**AHP (Iterative Approach w/ corrected CR)**	**ANP (Iterative Approach)**	**MAUT (Iterative Approach)**	**MAUT (ANP-Weighting Approach)**
1	12	12	12	12	12	12	12	12	12
2	7	11	11	8	9	10	11	9	11
3	10	10	9	10	11	11	10	11	5
4	2	6	6	3	4	4	5	5	3
5	6	9	8	9	5	6	7	8	8
6	1	5	5	5	7	7	6	3	7
7	4	7	7	6	8	8	8	6	6
1A	11	8	10	11	10	9	9	10	10
1-Off	8	1	1	1	1	1	1	1	1
2-Off	5	3	2	2	6	5	4	4	4
3-Off	9	2	3	7	2	2	2	7	2
16	3	4	4	4	3	3	3	2	9

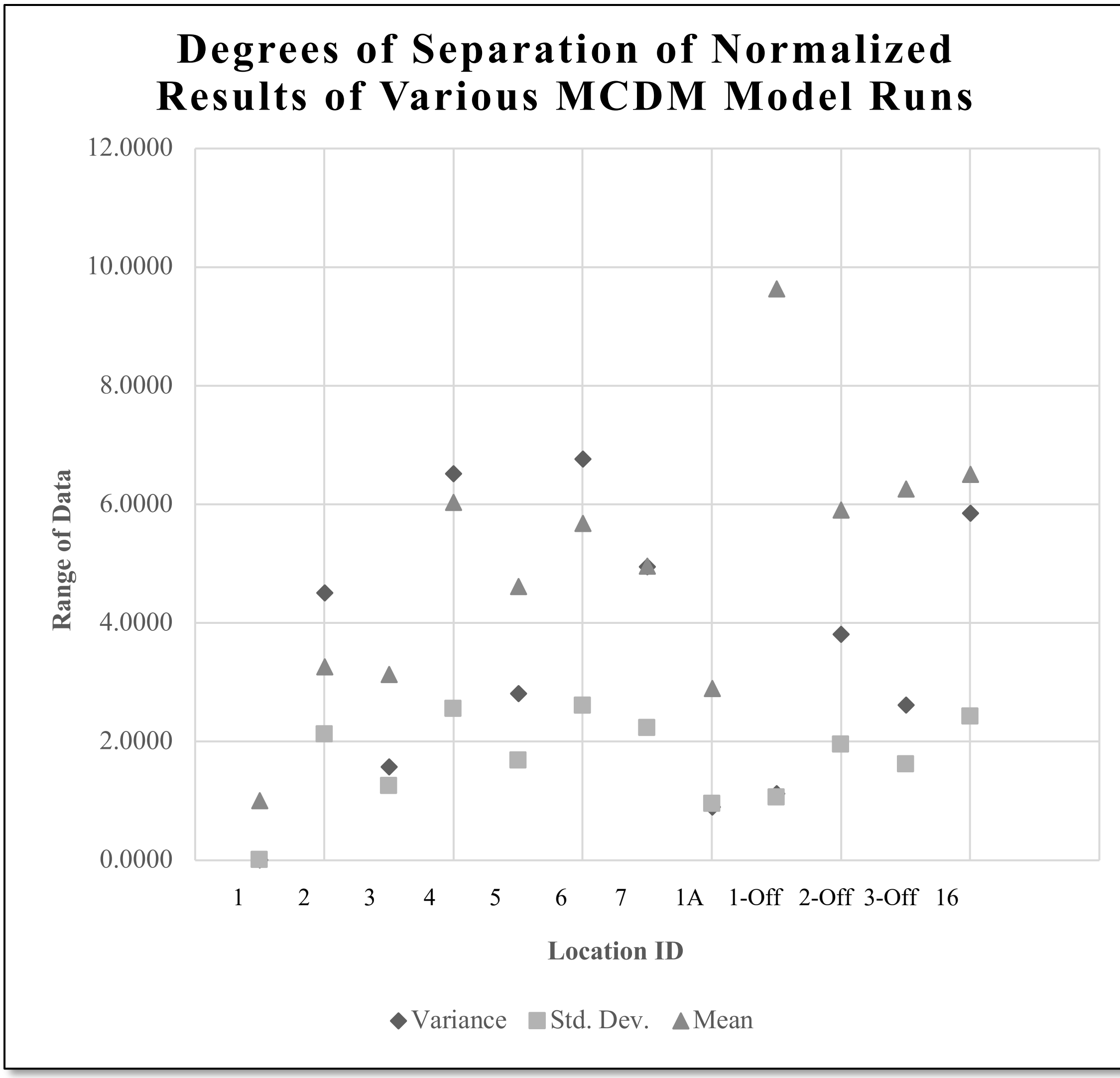

Figure 64. Scatterplot of Variance, Standard Deviation, and Mean of Normalized Results.

Determination of statistical outliers is not especially helpful, or even relevant, for the specific needs of the comparison because 100 percent of the population has been compared and reported (*i.e.,* the sample is the population). That is to say, the results of *all* MCDM model runs have been account for—are no unaccounted results for which predictive analytics could be applied. Furthermore, since each alternative (*i.e.,* each location) is considered a separate data series and each data series has nine data points in it, one for each of the MCDM models and hybrid approaches tested, the total sample size is very small. Therefore, the reliability of conventional statistics to speak toward any greater purpose, correlation, and/or trends beyond the scope of this dissertation is diminished.

In a different way of looking at it, consider this dissertation in its entirety, wherein a single decision problem has been analyzed six different ways with the results of those analyses compared; in other words, this entire dissertation, in essence, really only serves as a single data point. If, at some point in the future, should more decision problems be analyzed using the same six MCDMs used in this dissertation, then each one of those would represent a data point. Then, after several such studies, perhaps, meaningful statistical trends could be identified with respect to the various MCDMs.

Nevertheless, with respect to the results obtained from analyzing the various MCDMs in this dissertation, and in the interests of providing a better picture of the statistical range of that data, the common means of determining statistical outliers previously used in this dissertation (*i.e.,* greater than 3σ from μ or greater than 1.5 times the IQR plus or minus μ) are presented below in Table 294 with respect to the values presented in Table 292 above.

In addition to analyzing the results of the various MCDM models, it is also prudent to compare and contrast the weighting factors and PVs used in the models, especially since they played the deciding role in the outcome of each model. These values are juxtaposed in Table 295 below, and since they have all already been normalized to values between 1 and 10, the statistical calculations of mean, variance, and standard deviation for each criterion are also included in the table. Figure 65 graphically illustrates the statistical calculations provided in Table 295. For similar reasons of illustrating the statistical range of data found in Table 294, Table 296 presents the minimum and maximum values, IQR, and 6σ calculations with respect to the values presented in Table 295. As before, the same disclaimer must be made that the entire population has been sampled, each criterion represents a data series with nine data points (very small number to deduce any meaningful statistical information. In essence, the entire collection of data really only represents a single data point in the grand scheme of things.

Table 294. Determination of Statistical Outliers of Normalized Results of MCDM Models and Hybrid Approaches.

Loc. ID	3σ	μ + 3σ	μ – 3σ	Max Value in Data Set	Min Value in Data Set	Potential Outlier?	Q_1	Q_3	IQR	Q_1 – 1.5x IQR	Q_3 + 1.5x IQR	Potential Outlier?
1	0.0000	1.0000	1.0000	1.0000	1.0000	No	1.0000	1.0000	0.0000	1.0000	1.0000	No
2	6.3623	9.6207	-3.1038	6.9347	1.2986	No	1.4030	5.7332	4.3302	-5.0923	12.2285	No
3	3.7540	6.8831	-0.6249	4.7697	1.8849	No	1.8938	4.5564	2.6626	-2.1000	8.5502	No
4	7.6576	13.6844	-1.6308	9.8996	2.2687	No	3.4019	8.4710	5.0691	-4.2018	16.0746	No
5	5.0292	9.6358	-0.4226	7.2307	1.9887	No	2.9892	5.8802	2.8910	-1.3472	10.2166	No
6	7.7977	13.4756	-2.1197	10.0000	2.4022	No	3.3019	8.5450	5.2431	-4.5627	16.4095	No
7	6.6695	11.6288	-1.7101	8.4575	2.0048	No	2.8845	7.4914	4.6069	-4.0259	14.4018	No
1A	2.8384	5.7296	0.0528	4.3367	1.6234	No	2.1515	3.8785	1.7271	-0.4391	6.4691	No
1-Off	3.1744	12.8003	6.4515	10.0000	6.6330	No	10.0000	10.0000	0.0000	10.0000	10.0000	Yes
2-Off	5.8529	11.7565	0.0508	9.0296	3.3041	No	4.2067	8.1195	3.9128	-1.6626	13.9887	No
3-Off	4.8526	11.1036	1.3984	7.9345	3.2633	No	4.7924	7.6512	2.8588	0.5043	11.9393	No
16	7.2507	13.7506	-0.7507	9.5217	2.9563	No	3.6015	9.0493	5.4479	-4.5703	17.2211	No

Table 295. Comparison of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria Category	Criteria	MAUT (Initial)	AHP (Initial)	ANP (Initial)	MAUT (Validation Approach)
Meas. $C_{Rn\text{-}222}$	**Meas. $C_{Rn\text{-}222}$**	1.0000	1.0000	1.0000	1.0000
Distance	**Distance from LTP**	0.6667	0.4231	0.3680	0.6668
	Distance from 5-Off	0.1333	0.2272	0.2324	0.1333
	Distance from 6-Off	0.1333	0.2272	0.2759	0.1333
	Distance from 4-Off	0.0667	0.1225	0.1238	0.0666
Elevation	**Elevation**	1.0000	1.0000	1.0000	1.0000
Windward Exposure	**W. Exp. from LTP**	0.0000	0.0654	0.0653	0.0000
	W. Exp. from 5-Off	0.0000	0.1903	0.1902	0.0000
	W. Exp. from 6-Off	0.0000	0.1903	0.1902	0.0000
	W. Exp. from 4-Off	0.0000	0.5541	0.5543	0.0000
Wind Speed Categories	**LTP, *n*-Cat I**	0.1039	0.0296	0.0306	0.1251
	LTP, *n*-Cat II	0.0519	0.0168	0.0170	0.0208
	LTP, *n*-Cat III	0.0390	0.0094	0.0091	0.0208
	LTP, *n*-Cat IV	0.0260	0.0052	0.0048	0.0208
	LTP, *n*-Cat V	0.0130	0.0028	0.0021	0.0208
	LTP, *n*-Cat VI	0.0130	0.0016	0.0017	0.0208
	5-Off, *n*-Cat I	0.1039	0.0860	0.0496	0.1459
	5-Off, *n*-Cat II	0.0519	0.0488	0.0264	0.0208
	5-Off, *n*-Cat III	0.0390	0.0274	0.0139	0.0208
	5-Off, *n*-Cat IV	0.0260	0.0151	0.0062	0.0208
	5-Off, *n*-Cat V	0.0130	0.0081	0.0050	0.0208
	5-Off, *n*-Cat VI	0.0130	0.0048	0.0891	0.0208
	6-Off, *n*-Cat I	0.1039	0.0860	0.0891	0.1459
	6-Off, *n*-Cat II	0.0519	0.0488	0.0496	0.0208
	6-Off, *n*-Cat III	0.0390	0.0274	0.0264	0.0208
	6-Off, *n*-Cat IV	0.0260	0.0151	0.0139	0.0208
	6-Off, *n*-Cat V	0.0130	0.0081	0.0062	0.0208
	6-Off, *n*-Cat VI	0.0130	0.0048	0.0050	0.0208
	4-Off, *n*-Cat I	0.1169	0.2506	0.2579	0.1667
	4-Off, *n*-Cat II	0.0519	0.1420	0.1439	0.0208
	4-Off, *n*-Cat III	0.0390	0.0797	0.0766	0.0208
	4-Off, *n*-Cat IV	0.0260	0.0441	0.0442	0.0208
	4-Off, *n*-Cat V	0.0130	0.0237	0.0178	0.0208
	4-Off, *n*-Cat VI	0.0130	0.0140	0.0139	0.0208

Table 294 (Cont'd). Comparison of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria Category	Criteria	AHP (Iterative Approach with intolerable CR)	AHP (Iterative Approach with corrected CR)	ANP (Iterative Approach)
Meas. C_{Rn-222}	**Meas. C_{Rn-222}**	1.0000	1.0000	1.0000
Distance	**Distance from LTP**	10.0000	10.0000	0.7349
	Distance from 5-Off	1.1707	1.0323	0.0892
	Distance from 6-Off	1.1707	1.0323	0.0892
	Distance from 4-Off	1.0000	1.0000	0.0867
Elevation	**Elevation**	1.0000	1.0000	1.0000
Windward Exposure	**W. Exp. from LTP**	6.6378	6.8163	0.0000
	W. Exp. from 5-Off	2.5399	1.0000	0.0000
	W. Exp. from 6-Off	1.7966	1.0000	0.0000
	W. Exp. from 4-Off	1.2073	1.0000	0.0000
Wind Speed Categories	**LTP, *n*-Cat I**	1.0000	1.0000	0.0441
	LTP, *n*-Cat II	1.0000	1.0000	0.0410
	LTP, *n*-Cat III	8.1656	8.3429	0.0410
	LTP, *n*-Cat IV	2.5399	1.0000	0.0410
	LTP, *n*-Cat V	1.7966	1.0000	0.0410
	LTP, *n*-Cat VI	1.2073	1.0000	0.0410
	5-Off, *n*-Cat I	1.0000	1.0000	0.0410
	5-Off, *n*-Cat II	1.0000	1.0000	0.0410
	5-Off, *n*-Cat III	8.1656	8.3429	0.0410
	5-Off, *n*-Cat IV	2.5399	1.0000	0.0410
	5-Off, *n*-Cat V	1.7966	1.0000	0.0410
	5-Off, *n*-Cat VI	1.2073	1.0000	0.0449
	6-Off, *n*-Cat I	1.0000	1.0000	0.0449
	6-Off, *n*-Cat II	1.0000	1.0000	0.0410
	6-Off, *n*-Cat III	10.0000	10.0000	0.0410
	6-Off, *n*-Cat IV	2.5399	1.0000	0.0410
	6-Off, *n*-Cat V	1.7966	1.0000	0.0410
	6-Off, *n*-Cat VI	1.2073	1.0000	0.0410
	4-Off, *n*-Cat I	1.0000	1.0000	0.0459
	4-Off, *n*-Cat II	1.0000	1.0000	0.0410
	4-Off, *n*-Cat III	0.0000	0.0000	0.0410
	4-Off, *n*-Cat IV	0.0000	0.0000	0.0410
	4-Off, *n*-Cat V	0.0000	0.0000	0.0410
	4-Off, *n*-Cat VI	0.0000	0.0000	0.0410

Table 294 (Cont'd). Comparison of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria Category	Criteria	MAUT (Iterative Approach)	MAUT (ANP-Weighting Approach)
Meas. C_{Rn-222}	**Meas. C_{Rn-222}**	1.0000	1.0000
Distance	**Distance from LTP**	10.0000	10.0000
	Distance from 5-Off	1.0323	5.0025
	Distance from 6-Off	1.0323	6.6081
	Distance from 4-Off	1.0000	1.0000
Elevation	**Elevation**	1.0000	1.0000
Windward Exposure	**W. Exp. from LTP**	0.0000	0.0000
	W. Exp. from 5-Off	0.0000	0.0000
	W. Exp. from 6-Off	0.0000	0.0000
	W. Exp. from 4-Off	0.0000	0.0000
Wind Speed Categories	**LTP, *n*-Cat I**	6.8163	1.1188
	LTP, *n*-Cat II	1.0000	1.0630
	LTP, *n*-Cat III	1.0000	1.0302
	LTP, *n*-Cat IV	1.0000	1.0126
	LTP, *n*-Cat V	1.0000	1.0016
	LTP, *n*-Cat VI	1.0000	1.0000
	5-Off, *n*-Cat I	8.3429	2.0601
	5-Off, *n*-Cat II	1.0000	1.5875
	5-Off, *n*-Cat III	1.0000	1.3094
	5-Off, *n*-Cat IV	1.0000	1.1599
	5-Off, *n*-Cat V	1.0000	1.0666
	5-Off, *n*-Cat VI	1.0000	1.0531
	6-Off, *n*-Cat I	8.3429	2.0601
	6-Off, *n*-Cat II	1.0000	1.5875
	6-Off, *n*-Cat III	1.0000	1.3094
	6-Off, *n*-Cat IV	1.0000	1.1599
	6-Off, *n*-Cat V	1.0000	1.0666
	6-Off, *n*-Cat VI	1.0000	1.0531
	4-Off, *n*-Cat I	10.0000	10.0000
	4-Off, *n*-Cat II	1.0000	6.0180
	4-Off, *n*-Cat III	1.0000	3.6664
	4-Off, *n*-Cat IV	1.0000	2.5372
	4-Off, *n*-Cat V	1.0000	1.6132
	4-Off, *n*-Cat VI	1.0000	1.4774

Table 294 (Cont'd). Comparison of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria Category	Criteria	Mean	Variance	Standard Deviation
Meas. C_{Rn-222}	**Meas. C_{Rn-222}**	1.0000	0.0000	0.0000
Distance	**Distance from LTP**	4.1074	20.8470	4.5658
	Distance from 5-Off	0.5063	0.2000	0.4472
	Distance from 6-Off	0.5118	0.1972	0.4441
	Distance from 4-Off	0.4333	0.1931	0.4394
Elevation	**Elevation**	1.0000	0.0000	0.0000
Windward Exposure	**W. Exp. from LTP**	1.6981	8.4328	2.9039
	W. Exp. from 5-Off	0.4900	0.7003	0.8368
	W. Exp. from 6-Off	0.3971	0.3798	0.6163
	W. Exp. from 4-Off	0.4145	0.2122	0.4607
Wind Speed Categories	**LTP, *n*-Cat I**	1.1437	4.7535	2.1802
	LTP, *n*-Cat II	0.3934	0.2209	0.4700
	LTP, *n*-Cat III	2.2035	12.3053	3.5079
	LTP, *n*-Cat IV	0.5797	0.7207	0.8489
	LTP, *n*-Cat V	0.4845	0.4190	0.6473
	LTP, *n*-Cat VI	0.4107	0.2638	0.5136
	5-Off, *n*-Cat I	1.3462	7.1438	2.6728
	5-Off, *n*-Cat II	0.3986	0.2171	0.4659
	5-Off, *n*-Cat III	2.2063	12.2928	3.5061
	5-Off, *n*-Cat IV	0.5811	0.7191	0.8480
	5-Off, *n*-Cat V	0.4856	0.4180	0.6465
	5-Off, *n*-Cat VI	0.4225	0.2550	0.5050
	6-Off, *n*-Cat I	1.3516	7.1299	2.6702
	6-Off, *n*-Cat II	0.4015	0.2150	0.4637
	6-Off, *n*-Cat III	2.6443	18.1332	4.2583
	6-Off, *n*-Cat IV	0.5821	0.7179	0.8473
	6-Off, *n*-Cat V	0.4857	0.4179	0.6464
	6-Off, *n*-Cat VI	0.4115	0.2632	0.5130
	4-Off, *n*-Cat I	1.6048	10.1964	3.1932
	4-Off, *n*-Cat II	0.4250	0.2001	0.4474
	4-Off, *n*-Cat III	0.1571	0.1023	0.3198
	4-Off, *n*-Cat IV	0.1470	0.1042	0.3228
	4-Off, *n*-Cat V	0.1395	0.1059	0.3255
	4-Off, *n*-Cat VI	0.1378	0.1063	0.3261

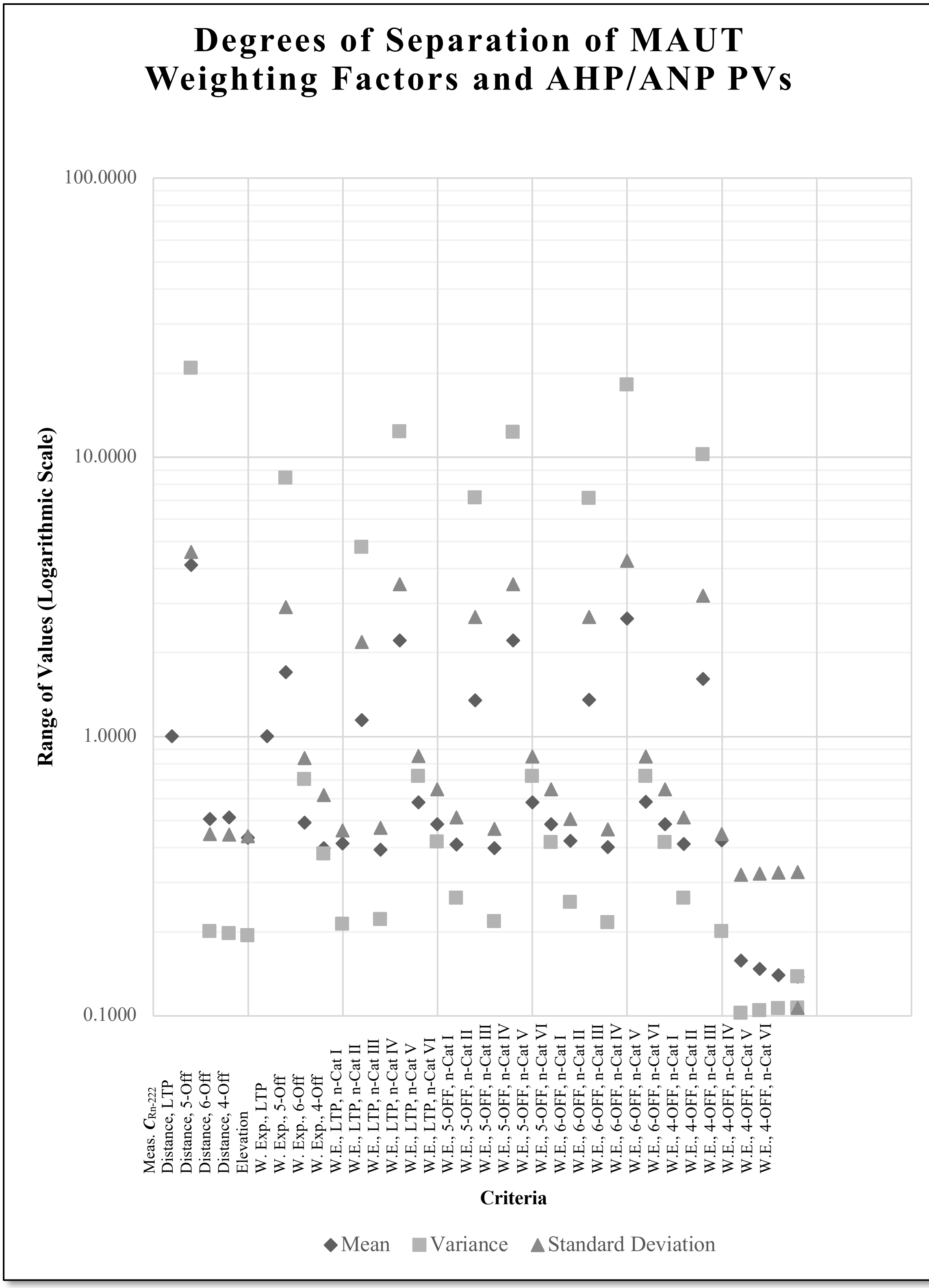

Figure 65. Scatterplot of Variance, Standard Deviation, and Mean of Normalized Weighting Factors and Priority Vectors on a Logarithmic Scale.

Table 296. Determination of Statistical Outliers of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria	3σ	μ + 3σ	μ – 3σ	Max Value in Data Set	Min Value in Data Set	Potential Outlier?	Q_1	Q_3	IQR	Q_1 – 1.5x IQR	Q_3 + 1.5x IQR	Potential Outlier?
Meas. $C_{Rn\text{-}222}$	0.0000	1.0000	1.0000	1.0000	1.0000	No	1.0000	1.0000	0.0000	1.0000	1.0000	No
Dist., LTP	13.6975	17.8050	-9.5901	10.0000	0.3680	No	0.5449	10.0000	9.4551	-13.6377	24.1826	No
Dist., 5-Off	1.3416	1.8480	-0.8353	1.1707	0.0892	No	0.1333	1.1015	0.9682	-1.3190	2.5538	No
Dist., 6-Off	1.3323	1.8441	-0.8205	1.1707	0.0892	No	0.1333	1.1015	0.9682	-1.3190	2.5538	No
Dist., 4-Off	1.3183	1.7516	-0.8850	1.0000	0.0666	No	0.0767	1.0000	0.9233	-1.3082	2.3849	No
Elevation	0.0000	1.0000	1.0000	1.0000	1.0000	No	1.0000	1.0000	0.0000	1.0000	1.0000	No
W.E., LTP	8.7118	10.4099	-7.0137	6.8163	0.0000	No	0.0000	3.3516	3.3516	-5.0274	8.3789	No
W.E., 5-Off	2.5105	3.0005	-2.0205	2.5399	0.0000	No	0.0000	0.5951	0.5951	-0.8927	1.4878	Yes
W.E., 6-Off	1.8488	2.2460	-1.4517	1.7966	0.0000	No	0.0000	0.5951	0.5951	-0.8927	1.4878	Yes
W.E., 4-Off	1.3820	1.7964	-0.9675	1.2073	0.0000	No	0.0000	0.7771	0.7771	-1.1657	1.9428	No
W.E., LTP, *n*-Cat I	6.5407	7.6844	-5.3971	6.8163	0.0296	No	0.0373	1.0594	1.0221	-1.4958	2.5925	Yes
W.E., LTP, *n*-Cat II	1.4099	1.8034	-1.0165	1.0000	0.0168	No	0.0189	1.0000	0.9811	-1.4527	2.4716	No
W.E., LTP, *n*-Cat III	10.5237	12.7272	-8.3202	8.3429	0.0091	No	0.0151	4.5979	4.5828	-6.8591	11.4721	No
W.E., LTP, *n*-Cat IV	2.5468	3.1265	-1.9671	2.5399	0.0048	No	0.0130	1.0063	0.9933	-1.4769	2.4962	Yes
W.E., LTP, *n*-Cat V	1.9419	2.4264	-1.4573	1.7966	0.0021	No	0.0079	1.0008	0.9929	-1.4815	2.4902	No
W.E., LTP, *n*-Cat VI	1.5409	1.9516	-1.1302	1.2073	0.0016	No	0.0074	1.0000	0.9926	-1.4816	2.4890	No
W.E., 5-Off, *n*-Cat I	8.0184	9.3645	-6.6722	8.3429	0.0410	No	0.0678	1.5301	1.4622	-2.1255	3.7234	Yes
W.E., 5-Off, *n*-Cat II	1.3978	1.7964	-0.9992	1.0000	0.0208	No	0.0337	1.0000	0.9663	-1.4157	2.4494	No
W.E., 5-Off, *n*-Cat III	10.5183	12.7247	-8.3120	8.3429	0.0139	No	0.0241	4.7375	4.7134	-7.0460	11.8076	No
W.E., 5-Off, *n*-Cat IV	2.5439	3.1251	-1.9628	2.5399	0.0062	No	0.0180	1.0800	1.0620	-1.5750	2.6729	No
W.E., 5-Off, *n*-Cat V	1.9396	2.4251	-1.4540	1.7966	0.0050	No	0.0106	1.0333	1.0227	-1.5235	2.5674	No
W.E., 5-Off, *n*-Cat VI	1.5150	1.9375	-1.0925	1.2073	0.0048	No	0.0169	1.0266	1.0097	-1.4976	2.5410	No

Table 295 (Cont'd). Determination of Statistical Outliers of Criteria Weighting Factors and Priority Vectors of MCDM Models and Hybrid Approaches.

Criteria	3σ	μ + 3σ	μ – 3σ	Max Value in Data Set	Min Value in Data Set	Potential Outlier?	Q_1	Q_3	IQR	Q_1 – 1.5x IQR	Q_3 + 1.5x IQR	Potential Outlier?
W.E., 6-Off, *n*-Cat I	8.0105	9.3621	-6.6590	8.3429	0.0449	No	0.0876	1.5301	1.4425	-2.0762	3.6938	Yes
W.E., 6-Off, *n*-Cat II	1.3910	1.7925	-0.9895	1.0000	0.0208	No	0.0449	1.0000	0.9551	-1.3878	2.4327	No
W.E., 6-Off, *n*-Cat III	12.7749	15.4192	-10.1306	10.0000	0.0208	No	0.0269	5.6547	5.6278	-8.4148	14.0964	No
W.E., 6-Off, *n*-Cat IV	2.5420	3.1241	-1.9599	2.5399	0.0139	No	0.0180	1.0800	1.0620	-1.5750	2.6729	No
W.E., 6-Off, *n*-Cat V	1.9392	2.4250	-1.4535	1.7966	0.0062	No	0.0106	1.0333	1.0227	-1.5235	2.5674	No
W.E., 6-Off, *n*-Cat VI	1.5390	1.9505	-1.1275	1.2073	0.0048	No	0.0090	1.0266	1.0175	-1.5173	2.5529	No
W.E., 4-Off, *n*-Cat I	9.5795	11.1843	-7.9748	10.0000	0.0459	No	0.1418	5.5000	5.3582	-7.8955	13.5373	No
W.E., 4-Off, *n*-Cat II	1.3421	1.7670	-0.9171	1.0000	0.0208	No	0.0465	1.0000	0.9535	-1.3839	2.4303	No
W.E., 4-Off, *n*-Cat III	0.9595	1.1166	-0.8024	1.0000	0.0000	No	0.0104	0.5399	0.5295	-0.7838	1.3340	No
W.E., 4-Off, *n*-Cat IV	0.9685	1.1155	-0.8215	1.0000	0.0000	No	0.0104	0.5221	0.5117	-0.7572	1.2897	No
W.E., 4-Off, *n*-Cat V	0.9764	1.1159	-0.8368	1.0000	0.0000	No	0.0065	0.5205	0.5140	-0.7645	1.2915	No
W.E., 4-Off, *n*-Cat VI	0.9783	1.1161	-0.8404	1.0000	0.0000	No	0.0065	0.5205	0.5140	-0.7645	1.2915	No

The final comparisons to be made are those between the MU values and Alternative-level PVs for the relevant models.[106] The MU values for this dissertation's problem statement were presented in CHAPTER 3 (*see* Tables Table ***38*** through

[106] MU values pertain to MAUT (as least as far as this dissertation is concerned). The PVs of interest for these comparisons are only those associated with an alternative, hence the term *Alternative-level PV*.

Table 47). In order to make a fair comparison, the MAUT MU values must be constrained such that the group of values of interest sum to 1. As done elsewhere in this dissertation, this is done simply enough by dividing a given MU value of interest by the sum of the entire group of the MU values of interest. No further work is needed for the Alternative-level PVs (or any PV correctly calculated by the AHP) because PVs produced via AHP are already constrained to equal 1. The constrained MAUT MU Values are presented in Table 297 below.

Table 297. Calculation of Normally Constrained MAUT MU Values.

	Meas. $C_{Rn\text{-}222}$		**Distance, LTP**		**Distance, 5-Off**		**Distance, 6-Off**	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	1.3707	**0.0550**	1.0057	**0.0215**	4.6027	**0.0595**	5.4160	**0.0766**
2	1.1667	**0.0468**	1.9028	**0.0406**	6.1099	**0.0790**	5.1406	**0.0727**
3	1.5341	**0.0616**	1.9190	**0.0410**	8.0278	**0.1038**	6.7575	**0.0956**
4	1.1078	**0.0445**	2.4161	**0.0516**	9.6630	**0.1249**	10.0000	**0.1414**
5	1.2373	**0.0497**	1.0000	**0.0213**	8.1455	**0.1053**	8.9350	**0.1264**
6	1.6256	**0.0653**	1.7342	**0.0370**	6.3883	**0.0826**	8.5381	**0.1208**
7	2.3802	**0.0955**	1.5254	**0.0326**	9.0229	**0.1166**	8.3780	**0.1185**
1A	10.0000	**0.4014**	2.5952	**0.0554**	3.3056	**0.0427**	4.4731	**0.0633**
1-Off	1.2373	**0.0497**	7.0609	**0.1507**	4.5272	**0.0585**	1.0000	**0.0141**
2-Off	1.0559	**0.0424**	8.6165	**0.1839**	6.5640	**0.0849**	1.6342	**0.0231**
3-Off	1.0000	**0.0401**	10.0000	**0.2135**	10.0000	**0.1293**	4.8168	**0.0681**
16	1.1965	**0.0480**	7.0687	**0.1509**	1.0000	**0.0129**	5.6153	**0.0794**

Table 296 (Cont'd). Calculation of Normally Constrained MAUT MU Values.

	Distance, 4-Off	**LTP, *n*-Cat I**	**LTP, *n*-Cat II**	**LTP, *n*-Cat III**

Loc. ID	MU	Constrained, Σ = 1	MU	Constrained, Σ = 1	MU	Constrained, Σ = 1	MU	Constrained, Σ = 1
1	6.6796	**0.0930**	8.1428	**0.0835**	2.3346	**0.0309**	1.0000	**0.0161**
2	4.9670	**0.0691**	9.3046	**0.0954**	9.1066	**0.1204**	6.9111	**0.1110**
3	4.6132	**0.0642**	8.0083	**0.0821**	5.2794	**0.0698**	2.5209	**0.0405**
4	6.4887	**0.0903**	7.6162	**0.0781**	5.0037	**0.0661**	4.2300	**0.0679**
5	7.8420	**0.1091**	1.0000	**0.0103**	1.0000	**0.0132**	3.1402	**0.0504**
6	8.8056	**0.1225**	8.2859	**0.0849**	9.4706	**0.1252**	10.0000	**0.1606**
7	5.7730	**0.0803**	8.3917	**0.0860**	5.3676	**0.0710**	4.0418	**0.0649**
1A	6.8946	**0.0959**	8.8382	**0.0906**	3.2279	**0.0427**	2.5836	**0.0415**
1-Off	5.0335	**0.0700**	9.3733	**0.0961**	8.2132	**0.1086**	7.3345	**0.1178**
2-Off	3.7596	**0.0523**	9.3046	**0.0954**	9.1066	**0.1204**	6.9111	**0.1110**
3-Off	1.0000	**0.0139**	10.0000	**0.1025**	10.0000	**0.1322**	8.4948	**0.1364**
16	10.0000	**0.1392**	9.2903	**0.0952**	7.5404	**0.0997**	5.1159	**0.0821**

	LTP, *n*-Cat IV		**LTP, *n*-Cat V**		**LTP, *n*-Cat VI**		**5-Off, *n*-Cat I**	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	1.0000	**0.0149**	2.2761	**0.0340**	3.4286	**0.0444**	3.9072	**0.0471**
2	4.1053	**0.0613**	1.0000	**0.0149**	1.0000	**0.0130**	7.2474	**0.0874**
3	1.3298	**0.0199**	1.5373	**0.0230**	5.3571	**0.0694**	7.2474	**0.0874**
4	8.9969	**0.1344**	10.0000	**0.1494**	10.0000	**0.1296**	10.0000	**0.1206**
5	8.7496	**0.1307**	10.0000	**0.1494**	10.0000	**0.1296**	10.0000	**0.1206**
6	10.0000	**0.1494**	10.0000	**0.1494**	10.0000	**0.1296**	5.2526	**0.0633**
7	7.2244	**0.1079**	8.6567	**0.1293**	10.0000	**0.1296**	10.0000	**0.1206**
1A	3.5557	**0.0531**	5.9030	**0.0882**	7.2143	**0.0935**	3.9072	**0.0471**
1-Off	6.3313	**0.0946**	5.2985	**0.0792**	5.2857	**0.0685**	8.1211	**0.0979**
2-Off	4.1053	**0.0613**	1.0000	**0.0149**	1.0000	**0.0130**	8.1211	**0.0979**
3-Off	6.6611	**0.0995**	4.5597	**0.0681**	4.7857	**0.0620**	8.1211	**0.0979**
16	4.8885	**0.0730**	6.7090	**0.1002**	9.0714	**0.1176**	1.0000	**0.0121**

Table 296 (Cont'd). Calculation of Normally Constrained MAUT MU Values.

	5-Off, *n*-Cat II		5-Off, *n*-Cat III		5-Off, *n*-Cat IV		5-Off, *n*-Cat V	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	1.0000	**0.0129**	1.0000	**0.0128**	4.0782	**0.0577**	6.6038	**0.0877**
2	4.9162	**0.0632**	6.0969	**0.0778**	5.2508	**0.0742**	4.5660	**0.0606**
3	4.9162	**0.0632**	6.0969	**0.0778**	5.2508	**0.0742**	4.5660	**0.0606**
4	10.0000	**0.1286**	10.0000	**0.1275**	10.0000	**0.1414**	10.0000	**0.1327**
5	10.0000	**0.1286**	10.0000	**0.1275**	10.0000	**0.1414**	10.0000	**0.1327**
6	4.7725	**0.0614**	6.2921	**0.0802**	9.0619	**0.1281**	10.0000	**0.1327**
7	10.0000	**0.1286**	10.0000	**0.1275**	10.0000	**0.1414**	10.0000	**0.1327**
1A	1.0000	**0.0129**	1.0000	**0.0128**	4.0782	**0.0577**	6.6038	**0.0877**
1-Off	8.2575	**0.1062**	6.0969	**0.0778**	1.0000	**0.0141**	1.0000	**0.0133**
2-Off	8.2575	**0.1062**	6.0969	**0.0778**	1.0000	**0.0141**	1.0000	**0.0133**
3-Off	8.2575	**0.1062**	6.0969	**0.0778**	1.0000	**0.0141**	1.0000	**0.0133**
16	6.3713	**0.0819**	9.6327	**0.1229**	10.0000	**0.1414**	10.0000	**0.1327**

	5-Off, *n*-Cat VI		6-Off, *n*-Cat I		6-Off, *n*-Cat II		6-Off, *n*-Cat III	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	10.0000	**0.1136**	5.3185	**0.0644**	7.9022	**0.0918**	8.8893	**0.0994**
2	7.5250	**0.0855**	7.4961	**0.0907**	6.2317	**0.0724**	6.6471	**0.0743**
3	7.5250	**0.0855**	8.1853	**0.0991**	6.8532	**0.0796**	5.4637	**0.0611**
4	10.0000	**0.1136**	10.0000	**0.1210**	10.0000	**0.1162**	10.0000	**0.1118**
5	10.0000	**0.1136**	10.0000	**0.1210**	10.0000	**0.1162**	10.0000	**0.1118**
6	10.0000	**0.1136**	5.3185	**0.0644**	7.9022	**0.0918**	8.8893	**0.0994**
7	10.0000	**0.1136**	7.4961	**0.0907**	6.2317	**0.0724**	6.6471	**0.0743**
1A	10.0000	**0.1136**	5.3185	**0.0644**	7.9022	**0.0918**	8.8893	**0.0994**
1-Off	1.0000	**0.0114**	1.0000	**0.0121**	1.0000	**0.0116**	1.0000	**0.0112**
2-Off	1.0000	**0.0114**	8.6828	**0.1051**	8.3295	**0.0968**	6.8962	**0.0771**
3-Off	1.0000	**0.0114**	8.5483	**0.1035**	6.3353	**0.0736**	6.4706	**0.0723**
16	10.0000	**0.1136**	5.2533	**0.0636**	7.3842	**0.0858**	9.6678	**0.1081**

Table 296 (Cont'd). Calculation of Normally Constrained MAUT MU Values.

	6-Off, *n*-Cat IV		**6-Off, *n*-Cat V**		**6-Off, *n*-Cat VI**		**4-Off, *n*-Cat I**	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	9.0000	**0.1021**	10.0000	**0.0963**	10.0000	**0.0967**	7.3711	**0.0953**
2	8.2222	**0.0933**	10.0000	**0.0963**	10.0000	**0.0967**	7.3711	**0.0953**
3	7.7778	**0.0882**	10.0000	**0.0963**	10.0000	**0.0967**	3.6211	**0.0468**
4	10.0000	**0.1134**	10.0000	**0.0963**	10.0000	**0.0967**	1.0000	**0.0129**
5	10.0000	**0.1134**	10.0000	**0.0963**	10.0000	**0.0967**	3.6211	**0.0468**
6	9.0000	**0.1021**	10.0000	**0.0963**	10.0000	**0.0967**	10.0000	**0.1293**
7	8.2222	**0.0933**	10.0000	**0.0963**	10.0000	**0.0967**	3.6211	**0.0468**
1A	9.0000	**0.1021**	10.0000	**0.0963**	10.0000	**0.0967**	7.3711	**0.0953**
1-Off	4.9444	**0.0561**	10.0000	**0.0963**	10.0000	**0.0967**	8.3376	**0.1078**
2-Off	1.0000	**0.0113**	1.0000	**0.0096**	1.0000	**0.0097**	8.3376	**0.1078**
3-Off	1.0000	**0.0113**	2.8000	**0.0270**	2.3846	**0.0231**	6.6753	**0.0863**
16	10.0000	**0.1134**	10.0000	**0.0963**	10.0000	**0.0967**	10.0000	**0.1293**
	4-Off, *n*-Cat II		**4-Off, *n*-Cat III**		**4-Off, *n*-Cat IV**		**4-Off, *n*-Cat V**	
Loc. ID	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**	**MU**	**Constrained, Σ = 1**
1	9.6629	**0.1061**	9.7775	**0.0976**	10.0000	**0.0980**	10.0000	**0.0980**
2	9.6629	**0.1061**	9.7775	**0.0976**	10.0000	**0.0980**	10.0000	**0.0980**
3	7.8258	**0.0859**	9.7330	**0.0971**	10.0000	**0.0980**	10.0000	**0.0980**
4	6.5955	**0.0724**	9.6440	**0.0963**	10.0000	**0.0980**	10.0000	**0.0980**
5	7.8258	**0.0859**	9.7330	**0.0971**	10.0000	**0.0980**	10.0000	**0.0980**
6	10.0000	**0.1098**	10.0000	**0.0998**	10.0000	**0.0980**	10.0000	**0.0980**
7	7.8258	**0.0859**	9.7330	**0.0971**	10.0000	**0.0980**	10.0000	**0.0980**
1A	9.6629	**0.1061**	9.7775	**0.0976**	10.0000	**0.0980**	10.0000	**0.0980**
1-Off	5.7697	**0.0634**	4.6044	**0.0460**	3.6211	**0.0355**	3.6000	**0.0353**
2-Off	5.2303	**0.0574**	6.4067	**0.0639**	7.3789	**0.0723**	7.4000	**0.0725**
3-Off	1.0000	**0.0110**	1.0000	**0.0100**	1.0000	**0.0098**	1.0000	**0.0098**
16	10.0000	**0.1098**	10.0000	**0.0998**	10.0000	**0.0980**	10.0000	**0.0980**

Table 296 (Cont'd). Calculation of Normally Constrained MAUT MU Values.

	4-Off, *n*-Cat VI	
Loc. ID	**MU**	**Constrained, Σ = 1**
1	10.0000	**0.0980**
2	10.0000	**0.0980**
3	10.0000	**0.0980**
4	10.0000	**0.0980**
5	10.0000	**0.0980**
6	10.0000	**0.0980**
7	10.0000	**0.0980**
1A	10.0000	**0.0980**
1-Off	5.5000	**0.0539**
2-Off	5.5000	**0.0539**
3-Off	1.0000	**0.0098**
16	10.0000	**0.0980**

Now that the MAUT MU values have been converted into a form that is comparable to that of the Alternative-level PVs from the AHP analyses, the final data comparisons of this dissertation can be made. In every MAUT, for each MCDM model run and each hybrid approach, the same MAUT MU Values were used. Only the weighting values were changed; that is to say, the underlying data and derivation of MU values remained constant. As noted above, both ANP model runs (*i.e.,* the initial ANP model and the one created to test the Iterative Approach) largely used the same pairwise comparisons as their respective AHP counterparts. The additional pairwise comparisons that were necessitated during the creation of the two different ANP models only pertained to higher levels in the [network] hierarchy structure, thus, they are not considered Alternative-level. As such, those additional pairwise comparisons are of no consequence to the analysis at hand between MAUT MU values and Alternative-level PVs. Furthermore, since no separate ANP or AHP model was created to test the ANP-Weighting Approach, because the hybrid approach begins with a completed ANP analysis, which, in this case would be identical to the initial one created. Finally, since the MAUT MU values were never altered during the course of this dissertation and were used consistently for each variation and/or iteration involving a MAUT analysis, and since every AHP Alternative-level pairwise comparison is identical[107] to its ANP counterpart, there are only three different values to compare for any given alternative with respect to a given criterion. The comparison between the normally constrained MAUT MU values and AHP / ANP Alternative-level PVs for each applicable variation and/or iteration, along with the calculated mean, variance, and standard deviation are presented below in Table 298.

As with the comparison of the results of each MCDM model run and the comparison of the MAUT weighting factors *v.* AHP / ANP PVs, each line item is considered its own data series. Unlike the previous two comparisons, there are only three different data points for any given data series in this comparison. While statistical calculations for minimum and maximum values, IQR, and 6σ were offered in the previous two comparisons, they are believed to be wholly unnecessary for the comparison of MAUT MU values *v.* Alternative-level PVs.

[107] Very small differences do exist between the PVs derived from AHP pairwise comparisons and those derived from ANP pairwise comparisons. These differences have not been explored but are likely due to the difference in calculation methods between the SuperDecisions software and the more straightforward Approximate Method that was used when entering formulas into Microsoft Excel spreadsheets. That is to say, for any given pairwise comparison in ANP for which an AHP counterpart exists, the same preference values were used as inputs, but the resulting PVs were very slightly different. Hence the wording footnoted phrase, that the *pairwise* comparisons are identical, even if the *PVs* are not. These small differences are deemed to be negligible and of no consequence for the needs of this dissertation.

Table 298. Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
Meas. C_{Rn-222}						
Loc. 1	0.0550	0.0471	0.0478	0.0500	1.28×10^{-5}	0.0036
Loc. 2	0.0468	0.0421	0.0559	0.0483	3.25×10^{-5}	0.0057
Loc. 3	0.0616	0.0529	0.0308	0.0484	1.68×10^{-4}	0.0130
Loc. 4	0.0445	0.0350	0.0631	0.0475	1.36×10^{-4}	0.0117
Loc. 5	0.0497	0.0394	0.0590	0.0494	6.37×10^{-5}	0.0080
Loc. 6	0.0653	0.0913	0.0319	0.0628	5.90×10^{-4}	0.0243
Loc. 7	0.0955	0.1710	0.0558	0.1074	0.0023	0.0478
Loc. 1A	0.4014	0.3408	0.4231	0.3884	0.0012	0.0348
Loc. 1-Off	0.0497	0.0623	0.0590	0.0570	2.86×10^{-5}	0.0053
Loc. 2-Off	0.0424	0.0376	0.0597	0.0466	9.02×10^{-5}	0.0095
Loc. 3-Off	0.0401	0.0333	0.0570	0.0435	9.89×10^{-5}	0.0099
Loc. 16	0.0480	0.0472	0.0570	0.0507	2.00×10^{-5}	0.0045
Distance from LTP						
Loc. 1	0.0215	0.0248	0.0298	0.0253	1.16×10^{-5}	0.0034
Loc. 2	0.0406	0.0280	0.0308	0.0331	2.92×10^{-5}	0.0054
Loc. 3	0.0410	0.0360	0.0312	0.0360	1.60×10^{-5}	0.0040
Loc. 4	0.0516	0.0297	0.0284	0.0366	1.13×10^{-4}	0.0106
Loc. 5	0.0213	0.0265	0.0296	0.0258	1.17×10^{-5}	0.0034
Loc. 6	0.0370	0.0293	0.0293	0.0319	1.33×10^{-5}	0.0036
Loc. 7	0.0326	0.0287	0.0343	0.0319	5.55×10^{-6}	0.0024
Loc. 1A	0.0554	0.0354	0.0313	0.0407	1.11×10^{-4}	0.0105
Loc. 1-Off	0.1507	0.1392	0.1428	0.1443	2.31×10^{-5}	0.0048
Loc. 2-Off	0.1839	0.2059	0.2002	0.1967	8.63×10^{-5}	0.0093
Loc. 3-Off	0.2135	0.2772	0.2693	0.2533	8.04×10^{-4}	0.0284
Loc. 16	0.1509	0.1392	0.1431	0.1444	2.36×10^{-5}	0.0049

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			**Statistical Calculations**		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
Distance from 5-Off						
Loc. 1	0.0595	0.0336	0.0334	0.0422	1.50×10^{-4}	0.0122
Loc. 2	0.0790	0.0574	0.0709	0.0691	7.93×10^{-5}	0.0089
Loc. 3	0.1038	0.0986	0.1053	0.1026	8.18×10^{-6}	0.0029
Loc. 4	0.1249	0.1729	0.1807	0.1595	6.08×10^{-4}	0.0247
Loc. 5	0.1053	0.1068	0.1107	0.1076	5.16×10^{-6}	0.0023
Loc. 6	0.0826	0.0599	0.0561	0.0662	1.36×10^{-4}	0.0117
Loc. 7	0.1166	0.1566	0.1457	0.1397	2.85×10^{-4}	0.0169
Loc. 1A	0.0427	0.0234	0.0237	0.0299	8.17×10^{-5}	0.0090
Loc. 1-Off	0.0585	0.0349	0.0326	0.0420	1.37×10^{-4}	0.0117
Loc. 2-Off	0.0849	0.0673	0.0605	0.0709	1.05×10^{-4}	0.0103
Loc. 3-Off	0.1293	0.1749	0.1670	0.1571	3.97×10^{-4}	0.0199
Loc. 16	0.0129	0.0136	0.0132	0.0133	7.47×10^{-8}	2.73×10^{-4}
Distance from 6-Off						
Loc. 1	0.0766	0.0483	0.0481	0.0577	1.79×10^{-4}	0.0134
Loc. 2	0.0727	0.0483	0.0479	0.0563	1.35×10^{-4}	0.0116
Loc. 3	0.0956	0.0951	0.0767	0.0891	7.76×10^{-5}	0.0088
Loc. 4	0.1414	0.0467	0.2008	0.1297	0.0040	0.0635
Loc. 5	0.1264	0.0478	0.1426	0.1056	0.0017	0.0414
Loc. 6	0.1208	0.0478	0.1562	0.1082	0.0020	0.0451
Loc. 7	0.1185	0.0478	0.1435	0.1033	0.0016	0.0405
Loc. 1A	0.0633	0.0551	0.0496	0.0560	3.17×10^{-5}	0.0056
Loc. 1-Off	0.0141	0.4176	0.0160	0.1492	0.0360	0.1897
Loc. 2-Off	0.0231	0.0594	0.0161	0.0329	3.59×10^{-4}	0.0190
Loc. 3-Off	0.0681	0.0420	0.0527	0.0543	1.15×10^{-4}	0.0107
Loc. 16	0.0794	0.0442	0.0500	0.0579	2.37×10^{-4}	0.0154

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
Distance from 4-Off						
Loc. 1	0.0930	0.0483	0.0790	0.0734	3.48×10^{-4}	0.0187
Loc. 2	0.0691	0.0483	0.0450	0.0541	1.14×10^{-4}	0.0107
Loc. 3	0.0642	0.0951	0.0527	0.0707	3.20×10^{-4}	0.0179
Loc. 4	0.0903	0.0467	0.0824	0.0731	3.60×10^{-4}	0.0190
Loc. 5	0.1091	0.0478	0.1170	0.0913	0.0010	0.0309
Loc. 6	0.1225	0.0478	0.1606	0.1103	0.0022	0.0469
Loc. 7	0.0803	0.0478	0.0616	0.0633	1.78×10^{-4}	0.0133
Loc. 1A	0.0959	0.0551	0.0825	0.0779	2.89×10^{-4}	0.0170
Loc. 1-Off	0.0700	0.4176	0.0467	0.1781	0.0288	0.1696
Loc. 2-Off	0.0523	0.0594	0.0335	0.0484	1.19×10^{-4}	0.0109
Loc. 3-Off	0.0139	0.0420	0.0148	0.0236	1.70×10^{-4}	0.0130
Loc. 16	0.1392	0.0442	0.2240	0.1358	0.0054	0.0734
Elevation						
Loc. 1	0.0634	0.0469	0.0447	0.0517	6.94×10^{-5}	0.0083
Loc. 2	0.0581	0.0469	0.0376	0.0475	7.06×10^{-5}	0.0084
Loc. 3	0.1174	0.0838	0.0819	0.0944	2.66×10^{-4}	0.0163
Loc. 4	0.0429	0.0440	0.0467	0.0445	2.63×10^{-6}	0.0016
Loc. 5	0.0448	0.0440	0.0461	0.0450	7.61×10^{-7}	0.0009
Loc. 6	0.0463	0.0440	0.0485	0.0463	3.45×10^{-6}	0.0019
Loc. 7	0.0493	0.0440	0.0546	0.0493	1.87×10^{-5}	0.0043
Loc. 1A	0.0822	0.0606	0.0508	0.0645	1.72×10^{-4}	0.0131
Loc. 1-Off	0.3424	0.4256	0.3985	0.3888	0.0012	0.0347
Loc. 2-Off	0.0847	0.0800	0.0534	0.0727	1.89×10^{-4}	0.0138
Loc. 3-Off	0.0342	0.0400	0.0737	0.0493	3.03×10^{-4}	0.0174
Loc. 16	0.0344	0.0400	0.0634	0.0459	1.58×10^{-4}	0.0126

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			**Statistical Calculations**		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., LTP, *n*-Cat I						
Loc. 1	0.0835	0.0819	0.0897	0.0850	1.14×10^{-5}	0.0034
Loc. 2	0.0954	0.0837	0.0891	0.0894	2.29×10^{-5}	0.0048
Loc. 3	0.0821	0.0827	0.0916	0.0855	1.88×10^{-5}	0.0043
Loc. 4	0.0781	0.1055	0.0828	0.0888	1.43×10^{-4}	0.0119
Loc. 5	0.0103	0.0099	0.0106	0.0102	7.86×10^{-8}	0.0003
Loc. 6	0.0849	0.0837	0.0768	0.0818	1.26×10^{-5}	0.0036
Loc. 7	0.0860	0.0865	0.0799	0.0841	8.97×10^{-6}	0.0030
Loc. 1A	0.0906	0.0865	0.1066	0.0945	7.50×10^{-5}	0.0087
Loc. 1-Off	0.0961	0.0921	0.0930	0.0937	2.90×10^{-6}	0.0017
Loc. 2-Off	0.0954	0.0921	0.0891	0.0922	6.54×10^{-6}	0.0026
Loc. 3-Off	0.1025	0.0977	0.1024	0.1009	4.97×10^{-6}	0.0022
Loc. 16	0.0952	0.0977	0.0883	0.0938	1.58×10^{-5}	0.0040
W.E., LTP, *n*-Cat II						
Loc. 1	0.0309	0.0171	0.0186	0.0222	3.81×10^{-5}	0.0062
Loc. 2	0.1204	0.1458	0.1539	0.1400	2.04×10^{-4}	0.0143
Loc. 3	0.0698	0.0400	0.0419	0.0506	1.85×10^{-4}	0.0136
Loc. 4	0.0661	0.0390	0.0446	0.0499	1.37×10^{-4}	0.0117
Loc. 5	0.0132	0.0148	0.0137	0.0139	4.57×10^{-7}	0.0007
Loc. 6	0.1252	0.1541	0.1419	0.1404	1.41×10^{-4}	0.0119
Loc. 7	0.0710	0.0421	0.0408	0.0513	1.94×10^{-4}	0.0139
Loc. 1A	0.0427	0.0271	0.0224	0.0307	7.51×10^{-5}	0.0087
Loc. 1-Off	0.1086	0.1111	0.1149	0.1115	6.75×10^{-6}	0.0026
Loc. 2-Off	0.1204	0.1541	0.1539	0.1428	2.52×10^{-4}	0.0159
Loc. 3-Off	0.1322	0.1684	0.1581	0.1529	2.32×10^{-4}	0.0152
Loc. 16	0.0997	0.0863	0.0952	0.0937	3.08×10^{-5}	0.0056

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., LTP, *n*-Cat III						
Loc. 1	0.0161	0.0173	0.0176	0.0170	4.26×10^{-7}	6.52×10^{-4}
Loc. 2	0.1110	0.1085	0.1174	0.1123	1.39×10^{-5}	0.0037
Loc. 3	0.0405	0.0269	0.0280	0.0318	3.79×10^{-5}	0.0062
Loc. 4	0.0679	0.0437	0.0438	0.0518	1.30×10^{-4}	0.0114
Loc. 5	0.0504	0.0318	0.0302	0.0375	8.42×10^{-5}	0.0092
Loc. 6	0.1606	0.2548	0.2462	0.2205	0.0018	0.0426
Loc. 7	0.0649	0.0413	0.0404	0.0489	1.28×10^{-4}	0.0113
Loc. 1A	0.0415	0.0285	0.0289	0.0330	3.61×10^{-5}	0.0060
Loc. 1-Off	0.1178	0.1184	0.1099	0.1153	1.48×10^{-5}	0.0039
Loc. 2-Off	0.1110	0.1241	0.1174	0.1175	2.89×10^{-5}	0.0054
Loc. 3-Off	0.1364	0.1459	0.1636	0.1486	1.27×10^{-4}	0.0113
Loc. 16	0.0821	0.0588	0.0567	0.0659	1.33×10^{-4}	0.0115
W.E., LTP, *n*-Cat IV						
Loc. 1	0.0149	0.0164	0.0190	0.0168	2.75×10^{-6}	0.0017
Loc. 2	0.0613	0.0375	0.0372	0.0454	1.28×10^{-4}	0.0113
Loc. 3	0.0199	0.0267	0.0158	0.0208	2.03×10^{-5}	0.0045
Loc. 4	0.1344	0.1719	0.1713	0.1592	3.08×10^{-4}	0.0175
Loc. 5	0.1307	0.1692	0.1592	0.1531	2.67×10^{-4}	0.0163
Loc. 6	0.1494	0.2041	0.2093	0.1876	7.34×10^{-4}	0.0271
Loc. 7	0.1079	0.0898	0.0948	0.0975	5.86×10^{-5}	0.0077
Loc. 1A	0.0531	0.0344	0.0375	0.0417	6.69×10^{-5}	0.0082
Loc. 1-Off	0.0946	0.0748	0.0893	0.0862	6.96×10^{-5}	0.0083
Loc. 2-Off	0.0613	0.0375	0.0372	0.0454	1.28×10^{-4}	0.0113
Loc. 3-Off	0.0995	0.0897	0.0852	0.0915	3.56×10^{-5}	0.0060
Loc. 16	0.0730	0.0478	0.0444	0.0551	1.63×10^{-4}	0.0128

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., LTP, *n*-Cat V						
Loc. 1	0.0340	0.0209	0.0197	0.0248	4.21×10^{-5}	0.0065
Loc. 2	0.0149	0.0184	0.0176	0.0170	2.17×10^{-6}	0.0015
Loc. 3	0.0230	0.0184	0.0169	0.0194	6.71×10^{-6}	0.0026
Loc. 4	0.1494	0.1903	0.1855	0.1751	3.33×10^{-4}	0.0183
Loc. 5	0.1494	0.1903	0.1855	0.1751	3.33×10^{-4}	0.0183
Loc. 6	0.1494	0.1983	0.1855	0.1777	4.29×10^{-4}	0.0207
Loc. 7	0.1293	0.1100	0.1391	0.1261	1.46×10^{-4}	0.0121
Loc. 1A	0.0882	0.0613	0.0606	0.0700	1.65×10^{-4}	0.0129
Loc. 1-Off	0.0792	0.0538	0.0540	0.0623	1.41×10^{-4}	0.0119
Loc. 2-Off	0.0149	0.0167	0.0176	0.0164	1.21×10^{-6}	0.0011
Loc. 3-Off	0.0681	0.0469	0.0444	0.0531	1.13×10^{-4}	0.0106
Loc. 16	0.1002	0.0748	0.0737	0.0829	1.50×10^{-4}	0.0123
W.E., LTP, *n*-Cat VI						
Loc. 1	0.0444	0.0233	0.0245	0.0308	9.40×10^{-5}	0.0097
Loc. 2	0.0130	0.0138	0.0135	0.0134	1.16×10^{-7}	3.40×10^{-4}
Loc. 3	0.0694	0.0382	0.0393	0.0490	2.09×10^{-4}	0.0145
Loc. 4	0.1296	0.1572	0.1542	0.1470	1.53×10^{-4}	0.0124
Loc. 5	0.1296	0.1572	0.1542	0.1470	1.53×10^{-4}	0.0124
Loc. 6	0.1296	0.1572	0.1542	0.1470	1.53×10^{-4}	0.0124
Loc. 7	0.1296	0.1572	0.1542	0.1470	1.53×10^{-4}	0.0124
Loc. 1A	0.0935	0.0679	0.0709	0.0774	1.31×10^{-4}	0.0114
Loc. 1-Off	0.0685	0.0382	0.0384	0.0484	2.03×10^{-4}	0.0142
Loc. 2-Off	0.0130	0.0138	0.0135	0.0134	1.16×10^{-7}	3.40×10^{-4}
Loc. 3-Off	0.0620	0.0364	0.0405	0.0463	1.26×10^{-4}	0.0112
Loc. 16	0.1176	0.1396	0.1424	0.1332	1.23×10^{-4}	0.0111

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 5-Off, *n*-Cat I						
Loc. 1	0.0471	0.0268	0.0249	0.0329	1.01×10^{-4}	0.0101
Loc. 2	0.0874	0.0711	0.0774	0.0786	4.52×10^{-5}	0.0067
Loc. 3	0.0874	0.0711	0.0774	0.0786	4.52×10^{-5}	0.0067
Loc. 4	0.1206	0.1666	0.1622	0.1498	4.30×10^{-4}	0.0207
Loc. 5	0.1206	0.1644	0.1622	0.1491	4.06×10^{-4}	0.0202
Loc. 6	0.0633	0.0325	0.0352	0.0437	1.95×10^{-4}	0.0140
Loc. 7	0.1206	0.1666	0.1622	0.1498	4.30×10^{-4}	0.0207
Loc. 1A	0.0471	0.0263	0.0249	0.0328	1.03×10^{-4}	0.0102
Loc. 1-Off	0.0979	0.0874	0.0869	0.0908	2.57×10^{-5}	0.0051
Loc. 2-Off	0.0979	0.0874	0.0869	0.0908	2.57×10^{-5}	0.0051
Loc. 3-Off	0.0979	0.0874	0.0869	0.0908	2.57×10^{-5}	0.0051
Loc. 16	0.0121	0.0124	0.0127	0.0124	6.88×10^{-8}	2.62×10^{-4}
W.E., 5-Off, *n*-Cat II						
Loc. 1	0.0129	0.0137	0.0136	0.0134	1.44×10^{-7}	3.80×10^{-4}
Loc. 2	0.0632	0.0391	0.0367	0.0464	1.43×10^{-4}	0.0120
Loc. 3	0.0632	0.0391	0.0367	0.0464	1.43×10^{-4}	0.0120
Loc. 4	0.1286	0.1722	0.1663	0.1557	3.72×10^{-4}	0.0193
Loc. 5	0.1286	0.1722	0.1663	0.1557	3.72×10^{-4}	0.0193
Loc. 6	0.0614	0.0372	0.0355	0.0447	1.39×10^{-4}	0.0118
Loc. 7	0.1286	0.1722	0.1663	0.1557	3.72×10^{-4}	0.0193
Loc. 1A	0.0129	0.0137	0.0136	0.0134	1.44×10^{-7}	0.0004
Loc. 1-Off	0.1062	0.0967	0.1034	0.1021	1.61×10^{-5}	0.0040
Loc. 2-Off	0.1062	0.0967	0.1034	0.1021	1.61×10^{-5}	0.0040
Loc. 3-Off	0.1062	0.0967	0.1034	0.1021	1.61×10^{-5}	0.0040
Loc. 16	0.0819	0.0505	0.0549	0.0625	1.93×10^{-4}	0.0139

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			**Statistical Calculations**		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 5-Off, *n*-Cat III						
Loc. 1	0.0128	0.0138	0.0131	0.0132	1.95×10^{-7}	4.41×10^{-4}
Loc. 2	0.0778	0.0482	0.0500	0.0587	1.83×10^{-4}	0.0135
Loc. 3	0.0778	0.0482	0.0500	0.0587	1.83×10^{-4}	0.0135
Loc. 4	0.1275	0.1704	0.1528	0.1502	3.09×10^{-4}	0.0176
Loc. 5	0.1275	0.1704	0.1528	0.1502	3.09×10^{-4}	0.0176
Loc. 6	0.0802	0.0506	0.0513	0.0607	1.91×10^{-4}	0.0138
Loc. 7	0.1275	0.1704	0.1528	0.1502	3.09×10^{-4}	0.0176
Loc. 1A	0.0128	0.0134	0.0131	0.0131	7.72×10^{-8}	0.0003
Loc. 1-Off	0.0778	0.0494	0.0500	0.0591	1.75×10^{-4}	0.0132
Loc. 2-Off	0.0778	0.0494	0.0500	0.0591	1.75×10^{-4}	0.0132
Loc. 3-Off	0.0778	0.0494	0.0500	0.0591	1.75×10^{-4}	0.0132
Loc. 16	0.1229	0.1665	0.2139	0.1677	0.0014	0.0372
W.E., 5-Off, *n*-Cat IV						
Loc. 1	0.0577	0.0342	0.0345	0.0421	1.21×10^{-4}	0.0110
Loc. 2	0.0742	0.0408	0.0441	0.0531	2.26×10^{-4}	0.0150
Loc. 3	0.0742	0.0413	0.0441	0.0532	2.23×10^{-4}	0.0149
Loc. 4	0.1414	0.1627	0.1616	0.1553	9.62×10^{-5}	0.0098
Loc. 5	0.1414	0.1627	0.1616	0.1553	9.62×10^{-5}	0.0098
Loc. 6	0.1281	0.1505	0.1519	0.1435	1.19×10^{-4}	0.0109
Loc. 7	0.1414	0.1627	0.1616	0.1553	9.62×10^{-5}	0.0098
Loc. 1A	0.0577	0.0347	0.0345	0.0423	1.18×10^{-4}	0.0109
Loc. 1-Off	0.0141	0.0149	0.0148	0.0146	1.18×10^{-7}	3.43×10^{-4}
Loc. 2-Off	0.0141	0.0149	0.0148	0.0146	1.18×10^{-7}	3.43×10^{-4}
Loc. 3-Off	0.0141	0.0149	0.0148	0.0146	1.18×10^{-7}	3.43×10^{-4}
Loc. 16	0.1414	0.1655	0.1616	0.1562	1.12×10^{-4}	0.0106

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 5-Off, *n*-Cat V						
Loc. 1	0.0877	0.0635	0.0587	0.0700	1.60×10^{-4}	0.0127
Loc. 2	0.0606	0.0383	0.0345	0.0445	1.33×10^{-4}	0.0115
Loc. 3	0.0606	0.0383	0.0345	0.0445	1.33×10^{-4}	0.0115
Loc. 4	0.1327	0.1521	0.1543	0.1464	9.42×10^{-5}	0.0097
Loc. 5	0.1327	0.1521	0.1543	0.1464	9.42×10^{-5}	0.0097
Loc. 6	0.1327	0.1467	0.1543	0.1446	8.00×10^{-5}	0.0089
Loc. 7	0.1327	0.1521	0.1543	0.1464	9.42×10^{-5}	0.0097
Loc. 1A	0.0877	0.0635	0.0587	0.0700	1.60×10^{-4}	0.0127
Loc. 1-Off	0.0133	0.0137	0.0140	0.0137	8.04×10^{-8}	2.84×10^{-4}
Loc. 2-Off	0.0133	0.0137	0.0140	0.0137	8.04×10^{-8}	2.84×10^{-4}
Loc. 3-Off	0.0133	0.0137	0.0140	0.0137	8.04×10^{-8}	2.84×10^{-4}
Loc. 16	0.1327	0.1521	0.1543	0.1464	9.42×10^{-5}	0.0097
W.E., 5-Off, *n*-Cat VI						
Loc. 1	0.1136	0.1133	0.1210	0.1160	1.26×10^{-5}	0.0035
Loc. 2	0.0855	0.0500	0.0580	0.0645	2.30×10^{-4}	0.0152
Loc. 3	0.0855	0.0500	0.0580	0.0645	2.30×10^{-4}	0.0152
Loc. 4	0.1136	0.1250	0.1210	0.1199	2.25×10^{-5}	0.0047
Loc. 5	0.1136	0.1250	0.1210	0.1199	2.25×10^{-5}	0.0047
Loc. 6	0.1136	0.1133	0.1210	0.1160	1.26×10^{-5}	0.0035
Loc. 7	0.1136	0.1309	0.1210	0.1218	5.04×10^{-5}	0.0071
Loc. 1A	0.1136	0.1250	0.1210	0.1199	2.25×10^{-5}	0.0047
Loc. 1-Off	0.0114	0.0121	0.0124	0.0120	1.99×10^{-7}	4.46×10^{-4}
Loc. 2-Off	0.0114	0.0121	0.0124	0.0120	1.99×10^{-7}	4.46×10^{-4}
Loc. 3-Off	0.0114	0.0121	0.0124	0.0120	1.99×10^{-7}	4.46×10^{-4}
Loc. 16	0.1136	0.1309	0.1210	0.1218	5.04×10^{-5}	0.0071

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

Location ID with respect to given Criterion	Model			Statistical Calculations		
	MAUT	AHP (Initial)	AHP (Iterative Approach)	Mean	Variance	Standard Deviation
W.E., 6-Off, *n*-Cat I						
Loc. 1	0.0644	0.0411	0.0376	0.0477	1.41×10^{-4}	0.0119
Loc. 2	0.0907	0.0780	0.0864	0.0850	2.79×10^{-5}	0.0053
Loc. 3	0.0991	0.0994	0.1156	0.1047	6.00×10^{-5}	0.0077
Loc. 4	0.1210	0.1699	0.1690	0.1533	5.22×10^{-4}	0.0228
Loc. 5	0.1210	0.1731	0.1690	0.1544	5.59×10^{-4}	0.0236
Loc. 6	0.0644	0.0381	0.0376	0.0467	1.57×10^{-4}	0.0125
Loc. 7	0.0907	0.0812	0.0864	0.0861	1.53×10^{-5}	0.0039
Loc. 1A	0.0644	0.0381	0.0376	0.0467	1.57×10^{-4}	0.0125
Loc. 1-Off	0.0121	0.0129	0.0127	0.0125	1.02×10^{-7}	0.0003
Loc. 2-Off	0.1051	0.1142	0.1089	0.1094	1.39×10^{-5}	0.0037
Loc. 3-Off	0.1035	0.1154	0.1021	0.1070	3.56×10^{-5}	0.0060
Loc. 16	0.0636	0.0387	0.0371	0.0465	1.47×10^{-4}	0.0121
W.E., 6-Off, *n*-Cat II						
Loc. 1	0.0918	0.0903	0.0843	0.0888	1.05×10^{-5}	0.0032
Loc. 2	0.0724	0.0535	0.0542	0.0600	7.68×10^{-5}	0.0088
Loc. 3	0.0796	0.0637	0.0627	0.0687	6.00×10^{-5}	0.0077
Loc. 4	0.1162	0.1769	0.1702	0.1544	7.39×10^{-4}	0.0272
Loc. 5	0.1162	0.1720	0.1702	0.1528	6.72×10^{-4}	0.0259
Loc. 6	0.0918	0.0896	0.0843	0.0886	9.86×10^{-6}	0.0031
Loc. 7	0.0724	0.0618	0.0542	0.0628	5.58×10^{-5}	0.0075
Loc. 1A	0.0918	0.0789	0.0843	0.0850	2.80×10^{-5}	0.0053
Loc. 1-Off	0.0116	0.0125	0.0123	0.0121	1.50×10^{-7}	3.88×10^{-4}
Loc. 2-Off	0.0968	0.0860	0.0795	0.0874	5.08×10^{-5}	0.0071
Loc. 3-Off	0.0736	0.0474	0.0575	0.0595	1.16×10^{-4}	0.0108
Loc. 16	0.0858	0.0674	0.0862	0.0798	7.63×10^{-5}	0.0087

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 6-Off, *n*-Cat III						
Loc. 1	0.0994	0.1114	0.1139	0.1082	4.01×10^{-5}	0.0063
Loc. 2	0.0743	0.0490	0.0476	0.0569	1.51×10^{-4}	0.0123
Loc. 3	0.0611	0.0399	0.0362	0.0457	1.20×10^{-4}	0.0110
Loc. 4	0.1118	0.1414	0.1295	0.1276	1.48×10^{-4}	0.0122
Loc. 5	0.1118	0.1414	0.1295	0.1276	1.48×10^{-4}	0.0122
Loc. 6	0.0994	0.1114	0.1139	0.1082	4.01×10^{-5}	0.0063
Loc. 7	0.0743	0.0508	0.0476	0.0576	1.42×10^{-4}	0.0119
Loc. 1A	0.0994	0.1114	0.1139	0.1082	4.01×10^{-5}	0.0063
Loc. 1-Off	0.0112	0.0119	0.0116	0.0116	8.96×10^{-8}	2.99×10^{-4}
Loc. 2-Off	0.0771	0.0544	0.0488	0.0601	1.49×10^{-4}	0.0122
Loc. 3-Off	0.0723	0.0458	0.0507	0.0563	1.33×10^{-4}	0.0115
Loc. 16	0.1081	0.1311	0.1569	0.1320	3.98×10^{-4}	0.0200
W.E., 6-Off, *n*-Cat IV						
Loc. 1	0.1021	0.1210	0.1007	0.1079	8.58×10^{-5}	0.0093
Loc. 2	0.0933	0.0784	0.0889	0.0868	3.90×10^{-5}	0.0062
Loc. 3	0.0882	0.0767	0.0919	0.0856	4.18×10^{-5}	0.0065
Loc. 4	0.1134	0.1263	0.1249	0.1215	3.32×10^{-5}	0.0058
Loc. 5	0.1134	0.1263	0.1249	0.1215	3.32×10^{-5}	0.0058
Loc. 6	0.1021	0.1035	0.1007	0.1021	1.28×10^{-6}	0.0011
Loc. 7	0.0933	0.0834	0.0889	0.0885	1.64×10^{-5}	0.0040
Loc. 1A	0.1021	0.1035	0.1007	0.1021	1.28×10^{-6}	0.0011
Loc. 1-Off	0.0561	0.0301	0.0294	0.0385	1.54×10^{-4}	0.0124
Loc. 2-Off	0.0113	0.0123	0.0121	0.0119	1.66×10^{-7}	4.08×10^{-4}
Loc. 3-Off	0.0113	0.0123	0.0121	0.0119	1.66×10^{-7}	4.08×10^{-4}
Loc. 16	0.1134	0.1263	0.1249	0.1215	3.32×10^{-5}	0.0058

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 6-Off, *n*-Cat V						
Loc. 1	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 2	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 3	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 4	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 5	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 6	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 7	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 1A	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 1-Off	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
Loc. 2-Off	0.0096	0.0105	0.0106	0.0102	1.81×10^{-7}	4.25×10^{-4}
Loc. 3-Off	0.0270	0.0146	0.0140	0.0185	3.57×10^{-5}	0.0060
Loc. 16	0.0963	0.0975	0.0975	0.0971	3.08×10^{-7}	5.55×10^{-4}
W.E., 6-Off, *n*-Cat VI						
Loc. 1	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 2	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 3	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 4	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 5	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 6	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 7	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 1A	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 1-Off	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}
Loc. 2-Off	0.0097	0.0105	0.0107	0.0103	2.03×10^{-7}	4.51×10^{-4}
Loc. 3-Off	0.0231	0.0146	0.0130	0.0169	1.95×10^{-5}	0.0044
Loc. 16	0.0967	0.0975	0.0976	0.0973	1.58×10^{-7}	3.97×10^{-4}

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 4-Off, *n*-Cat I						
Loc. 1	0.0953	0.0847	0.0852	0.0884	2.39×10^{-5}	0.0049
Loc. 2	0.0953	0.0847	0.0852	0.0884	2.39×10^{-5}	0.0049
Loc. 3	0.0468	0.0255	0.0254	0.0326	1.02×10^{-4}	0.0101
Loc. 4	0.0129	0.0135	0.0137	0.0134	1.01×10^{-7}	3.18×10^{-4}
Loc. 5	0.0468	0.0255	0.0254	0.0326	1.02×10^{-4}	0.0101
Loc. 6	0.1293	0.1894	0.1832	0.1673	7.27×10^{-4}	0.0270
Loc. 7	0.0468	0.0255	0.0254	0.0326	1.02×10^{-4}	0.0101
Loc. 1A	0.0953	0.0847	0.0852	0.0884	2.39×10^{-5}	0.0049
Loc. 1-Off	0.1078	0.1033	0.1039	0.1050	4.01×10^{-6}	0.0020
Loc. 2-Off	0.1078	0.1033	0.1039	0.1050	4.01×10^{-6}	0.0020
Loc. 3-Off	0.0863	0.0704	0.0805	0.0791	4.33×10^{-5}	0.0066
Loc. 16	0.1293	0.1894	0.1832	0.1673	7.27×10^{-4}	0.0270
W.E., 4-Off, *n*-Cat II						
Loc. 1	0.1061	0.1308	0.1509	0.1293	3.36×10^{-4}	0.0183
Loc. 2	0.1061	0.1308	0.1509	0.1293	3.36×10^{-4}	0.0183
Loc. 3	0.0859	0.0753	0.0684	0.0765	5.22×10^{-5}	0.0072
Loc. 4	0.0724	0.0429	0.0458	0.0537	1.77×10^{-4}	0.0133
Loc. 5	0.0859	0.0720	0.0684	0.0754	5.73×10^{-5}	0.0076
Loc. 6	0.1098	0.1332	0.1085	0.1172	1.29×10^{-4}	0.0114
Loc. 7	0.0859	0.0687	0.0684	0.0743	6.73×10^{-5}	0.0082
Loc. 1A	0.1061	0.1341	0.1509	0.1304	3.42×10^{-4}	0.0185
Loc. 1-Off	0.0634	0.0363	0.0351	0.0449	1.70×10^{-4}	0.0131
Loc. 2-Off	0.0574	0.0313	0.0329	0.0406	1.43×10^{-4}	0.0120
Loc. 3-Off	0.0110	0.0114	0.0114	0.0113	4.29×10^{-8}	2.07×10^{-4}
Loc. 16	0.1098	0.1332	0.1085	0.1172	1.29×10^{-4}	0.0114

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 4-Off, *n*-Cat III						
Loc. 1	0.0976	0.1029	0.1022	0.1009	5.63×10^{-6}	0.0024
Loc. 2	0.0976	0.1029	0.1022	0.1009	5.63×10^{-6}	0.0024
Loc. 3	0.0971	0.1029	0.1020	0.1007	6.45×10^{-6}	0.0025
Loc. 4	0.0963	0.1029	0.1280	0.1091	1.87×10^{-4}	0.0137
Loc. 5	0.0971	0.1029	0.1020	0.1007	6.45×10^{-6}	0.0025
Loc. 6	0.0998	0.1057	0.0970	0.1008	1.31×10^{-5}	0.0036
Loc. 7	0.0971	0.1029	0.1020	0.1007	6.45×10^{-6}	0.0025
Loc. 1A	0.0976	0.1029	0.1022	0.1009	5.63×10^{-6}	0.0024
Loc. 1-Off	0.0460	0.0223	0.0213	0.0299	1.30×10^{-4}	0.0114
Loc. 2-Off	0.0639	0.0353	0.0334	0.0442	1.96×10^{-4}	0.0140
Loc. 3-Off	0.0100	0.0105	0.0106	0.0104	7.91×10^{-8}	2.81×10^{-4}
Loc. 16	0.0998	0.1057	0.0970	0.1008	1.31×10^{-5}	0.0036
W.E., 4-Off, *n*-Cat IV						
Loc. 1	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 2	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 3	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 4	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 5	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 6	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 7	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 1A	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025
Loc. 1-Off	0.0355	0.0182	0.0168	0.0235	7.25×10^{-5}	0.0085
Loc. 2-Off	0.0723	0.0387	0.0438	0.0516	2.19×10^{-4}	0.0148
Loc. 3-Off	0.0098	0.0105	0.0106	0.0103	1.29×10^{-7}	3.60×10^{-4}
Loc. 16	0.0980	0.1036	0.1032	0.1016	6.44×10^{-6}	0.0025

Table 297 (Cont'd). Comparison of Normally Constrained MAUT MU Values and AHP / ANP Alternative-Level PVs.

	Model			Statistical Calculations		
Location ID with respect to given Criterion	**MAUT**	**AHP (Initial)**	**AHP (Iterative Approach)**	**Mean**	**Variance**	**Standard Deviation**
W.E., 4-Off, *n*-Cat V						
Loc. 1	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 2	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 3	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 4	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 5	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 6	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 7	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 1A	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
Loc. 1-Off	0.0353	0.0182	0.0167	0.0234	7.11×10^{-5}	0.0084
Loc. 2-Off	0.0725	0.0387	0.0441	0.0518	2.20×10^{-4}	0.0148
Loc. 3-Off	0.0098	0.0105	0.0106	0.0103	1.30×10^{-7}	3.60×10^{-4}
Loc. 16	0.0980	0.1036	0.1032	0.1016	6.41×10^{-6}	0.0025
W.E., 4-Off, *n*-Cat VI						
Loc. 1	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 2	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 3	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 4	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 5	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 6	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 7	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 1A	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030
Loc. 1-Off	0.0539	0.0238	0.0255	0.0344	1.91×10^{-4}	0.0138
Loc. 2-Off	0.0539	0.0238	0.0255	0.0344	1.91×10^{-4}	0.0138
Loc. 3-Off	0.0098	0.0104	0.0105	0.0102	9.23×10^{-8}	3.04×10^{-4}
Loc. 16	0.0980	0.1047	0.1043	0.1023	9.23×10^{-6}	0.0030

4.4. Interpretation of the Results

Examination of Tables Table ***290*** through Table ***293*** reveals some obvious conclusions, as well as not-so-obvious ones. As borne out by this dissertation, it is now known that every single MCDM model (and hybrid approach) with the exception of the very first MAUT resulted in the selection of Location 1-Off as the most rational choice. What may have not been discussed or emphasized until now is the fact that Location 1 was universally determined to be the least rational choice, but that is really where the major commonalities cease.

It could be expected that the results of the three base models (*i.e.,* the initial MAUT, initial AHP, and initial ANP analyses) would produce different rankings, due to the different means by which value judgments are assessed between the different models, yet the differences in rankings are glaring. There is little consistency beyond the most and least rational choice—even if the initial MAUT is excluded (since it was deemed to be inaccurate upon further consideration during the Validation Approach), the remaining outcomes do not even agree on the top three or bottom three rankings.

The statistical calculations presented in Table 292 indicate a minimum variance of 0.000 for Location 1 (*i.e.* it was universally indicated to be the least rational choice across the board) and a maximum variance of 6.7559 for Location 6. Excluding Location 1, the next lowest variance between the comparison of the results is for Location 1A with a variance of 0.89852. The standard deviations associated with Locations 1, 6, 1A, and 1-Off are: 0.0000, 2.5992, 0.9461, and 1.0581, respectively. In all, the variances (and therefore, the standard deviations) of the results between the various MCDM models and hybrid approaches are indicative of very tight data sets with little dispersion for each data series.

The standard deviation calculated for each data series in the comparison of MAUT weighting factors *v.* AHP / ANP [global] PVs in Table 295 is also indicative of very tight data sets with little dispersion. As with the comparison of the results, each row of data is considered an individual set; the greatest standard deviation of any set in the comparison of MAUT weighting factors *v.* AHP / ANP PVs is 4.5659 for the criterion of Distance from the LTP while the smallest standard deviation is given as 0.0000 for both $\boldsymbol{C}_{\text{Rn-222}}$ and Elevation. Excluding $\boldsymbol{C}_{\text{Rn-222}}$ and Elevation (which both have zero variance within their respective data series because they became "singletons" when the weighting factors and PVs were grouped), the next smallest standard deviation is given as 0.3198 for Windward Exposure as function of Wind Speed from Location 4-Off, for *n*-Category III.

For the comparison between the MAUT weighting factors and AHP [global] PVs, a small variance would be certainly be expected with respect to the Iterative Approach since the MAUT weighting factors were plugged into AHP-style pairwise comparisons, which subsequently produced the PVs. Similarly, a small variance would also be expected between the initial ANP [global] PVs and the ANP-Weighted MAUT weighting factors (since they were used as direct inputs).

The comparison of normally constrained MAUT MU values to their corresponding AHP / ANP Alternative-level PVs presented above in Table 298 indicates a series of data sets that each possess a moderate degree of dispersion. The greatest standard deviation of any data set in this comparison is given as 0.1897 and is associated with the data set for Distance from 6-Off for Location 1-Off. The smallest standard deviation is given as 0.000207 (2.07×10^{-4}) and is associated with the data set for Windward Exposure as a function of Wind Speed from 4-Off at *n*-Cat II for Location 3-Off.

4.5. Observed Patterns

Broader comparison of the results, as well as the comparison between the MAUT weighting factors and AHP / ANP [global] PVs, support one of the underlying assumptions of this research: that the use of consistent logic would produce similar, albeit not identical, results regardless of which MCDM model was chosen. This is certainly made apparent in Table 293, which gives the rankings of the alternatives indicated by each MCDM model. Since "use of consistent logic" is somewhat intangible and therefore difficult to prove, evidence supporting the use of consistent logic draws strength from the use of actual data pertaining to the specimen site, from which all MAUT MU values and AHP / ANP PVs were derived.

Due to the ability of ANP to account for network relationships, and as borne out by the research herein, there are a few final thoughts to impart with respect to rankings of the alternatives (again, *see* Table 293). Among these, it is interesting to note that both AHP-style pairwise comparisons conducted as part of the Iterative Approach ranked 8 out of the 12 alternatives the same, with the top four alternatives for both models in complete agreement. This is noteworthy, because the first AHP-style pairwise comparison was informed by the initial MAUT analysis, whereas the second one was informed by the re-evaluated [validated] MAUT analysis created during the Validation Approach, which used a significantly different arrangement of weighting factors. Not surprising, the second AHP-style comparison done during the Iterative Approach (*i.e.,* the one with the corrected CR) holds 6 out of the 12 alternative rankings the same. It is also interesting to note that only 5 out of the 12 alternative rankings between the initial ANP analysis and ANP-Weighted MAUT analysis are in agreement; because the results of the former informed the latter, one could have expected a greater degree of congruency.

Another interesting aspect to the rankings of the alternatives is the difference between the rankings of the initial MAUT and that of the Iterative Approach's first attempt to produce AHP-style pairwise comparisons (and PVs)—which used the initial MAUT results as inputs. Even using the initial MAUT results, and even though the CR indicated the pairwise comparison to be intolerably inconsistent, the resultant [global] PVs from that AHP-style comparison are much more akin to the other MCDM alternative rankings than they are to the initial MAUT analysis.

Lastly, it is interesting to note, at least the top five most commonly ranked alternatives. As mentioned earlier, Location 1 was universally the identified as the least rational choice, Location 1-off was ranked in 8 out of the 9 MCDM models as the most rational choice, and Location 16 was ranked in 4 out of the 9 MCDM models as the third most rational choice. In general, a plain observation of the ranking of the alternatives indicates that even though they are not congruently ranked from one MCDM model to another, the order of the rankings, in general, are often very close to one another.

4.6. Observed Outliers

While there were a few potential outliers identified in Tables Table ***294*** and Table ***296***, none of these are deemed to be true statistical outliers. This is due to the reasons previously expressed, namely, that the sample size is too small to make any meaningful statistical determinations and more pointedly, that the entire dissertation in and of itself essentially manifests itself as a single data point in its endeavor to compare MAUT, AHP, ANP, and the three hybrid approaches. No other statistical outliers of worthy mention were observed.

CHAPTER 5

CONCLUSION

5.1. Introduction

This research demonstrates a clear need for a better, quicker decision-making process. This dissertation took one researcher more than two years to hammer out, with no interference or deliberations by committees or the potential for delay by those with opposing views, public hearings, oppositional political drama, laboratory delays, research funding issues, *etc.* It does not require a stretch of the imagination to envision how long an MCDM process involving complicated engineering management applications would take. This process would take much longer in real-life settings, with real regulators, real funding delays, real bureaucracy and attorney-related delays, real administrative procedures to be followed, committee decisions at every turn, intervening opinions imparted by boards of directors, real disagreements between subject matter experts, overarching—and quite possibly conflicting—directions of real executives with their concerns of cash flow, SLTO issues, and shareholder perceptions. Real decisions can be tough.

With the amount of time it would take to collect the data in the field, the time required to analyze and interpret the data and the constant negotiations with regulatory agencies and oppositional non-government organizations, it is conceivable a MAUT process could take more than a **decade** from beginning to end before a decision could ultimately be made. While ANP is generally regarded as a quicker and more intuitive process than MAUT, the mechanics of how it works require a significant amount of time to adequately explain to stakeholders who do not have a background in MCDM. MAUT is a methodical, tedious, and lengthy but very straightforward and easy to explain process; ANP is a very quick, intuitive, and short process that is difficult to explain.

Academic theories are often the result of complicated observations, calculations, and relationships that have been generalized into very simplistic terms, with the intent to be applied universally for any number of given situations. After all, a theory holds true under its stated assumptions so long as it can be applied without contradiction. While that is adequate for academic purposes, real-life applications that undertake a comprehensive MAUT process for a complicated issue could easily take several years to complete. There is obvious value in shortening the duration it takes to perform a comprehensive MCDM problem for decisions with numerous attributes. Succinctly, MCDM merely refers to decisions with more than one criterion, but there is an exponential difference between a textbook rendition of a multiple criteria decision with three criteria and a real-life decision with a dozen or more criteria. **M**CDM (emphasis on the initial "M") might not adequately describe the complexity, effort, and resources required to analyze decisions with a high number of attributes, and in the field of engineering management, there are a great many such decisions to be made.

In sum, this entire research effort was undertaken in an attempt to help engineering managers and academic professionals find a better way to make decisions. Based on a preponderance of the evidence, the hybrid approaches posited herein are believed to accomplish that goal.

5.2. The Revealed Choice, the Right Choice, and the Defensible Choice

It seems prudent to answer a question that may have been in the backs of some readers' minds: What is the right answer? As with any rational decision problem, there is no *right* answer. The rational answer, the *defensible* answer, is any answer for which proper due diligence has been paid, the choice that is supported by methodical preferences and/or utility values imbued with utilitarian underpinnings. Whatever the decision, whether it winds up being a glowing and profitable success or a disastrous and abject failure, the *rational* choice remains the same.

For this dissertation, there was a single decision problem at hand: Which, of the alternatives available, is the most geographically appropriate location indicative of the relative natural background value for radon [in air]? The decision problem was analyzed six different ways; three different ways using the tried and true, academically proven techniques of MAUT, AHP, and ANP and three different ways using various combinations of these theories in the named hybrid approaches. For a moment, forget about the notion that five of the six models produced the same rational choice (*i.e.,* Location 1-Off). In a proverbial vacuum, assuming a decision-maker, chose at random any of the six different methods, which one would produce the most *rational* answer? The answer: all of them. Even the initial MAUT.

Even the initial MAUT [repeated again for emphasis] is defensible. Even though the initial MAUT was later revised—thanks to the protocols established for the Validation Approach—it nevertheless stands as a recognized MCDM technique. Moving through the MAUT the first time, sound judgments were made based on the available data to arrive at a decision—a rational decision. If that were the only MCDM pursued, and barring any conflicting data, there would be no reason to question it. This narrative might provide little comfort for those seeking solace in an all-encompassing solution, but when it comes to RDM, there is no right answer. There is only a rational answer based on the subjective inputs of humans.

What, then, is the revealed choice? This, too, is somewhat complicated, but here are the answers: both Location 1-Off and Location 16. For the specimen site, Location 16 has long since been the "background location." This location has also long-since been believed to be inappropriate, as evident not only by this author's firsthand experience but as further supported by NRC correspondence on the matter, all of which is publicly available. As of the date of publication of this dissertation, Location 16 remains the official radon background location. Location 1-Off is the revealed answer so far as ERG (2013) is concerned. Beginning circa 2011, ERG set about to determine a more appropriate location to represent the relative natural background value for radon [in air] than Location 16. ERG's conclusion was Location 1-Off, but this was based entirely on radiological measurements, GIS databases, topography, and airflow models, and not on a formal MCDM method. Thus, at a minimum, this dissertation lends further credence to the work given by ERG (2013).

5.3. Summary Review of the MCDM Models and Combinational Hybrid Approaches

In Table 1, the advantages and disadvantages of MAUT, AHP, ANP, and the hybrid approaches were presented. As borne out by this research, it can be affirmatively attested that:

- The MAUT process is long and tedious.
- While simple to explain and easy to understand, AHP is in fact only a *simple* MDCM technique for *simple* problems; it quickly becomes just as long and tedious, if not longer and more tedious, than any MAUT process when the decision problem becomes more complicated.
- ANP—a very sophisticated MCDM—is not easy to explain, but it does account for the often-complicated network relationships that manifest themselves in real-life situations.
- The Validation Approach, as expected, is clearly the most reliable and defensible hybrid approach tested in this dissertation. Robustness and defensibility are all but assured by the fact that a given decision problem becomes subject to three different—

and independent—analyses. Academically sound, the Validation Approach allows the solution to a decision problem to be *sanity-checked*. It takes a considerable amount of time to run the same exact decision problem through three different models, but in the end, depending on the decision problem at issue, it may very well be worth it.

- The Iterative Approach is much more straightforward than the Validation Approach, and even though the AHP-style pairwise comparison appears to be impervious to a flawed MAUT analysis, it would still require dozens, if not hundreds, more case studies to support it as a viable, reliable, and academically acceptable MCDM model.
- The ANP-Weighting Approach, true to its tenets from the outset, is a streamlined approach compared to the other two hybrids, but like the Iterative Approach, it too would require a significant amount of additional testing before it could be considered an acceptable mainstream MCDM. In this dissertation, the results of the MAUT analysis portion of the ANP-Weighting Approach are deemed to be the results of the entire combinational MCDM hybrid, and while that structure might serve to provide boundaries, it is merely a policy. It remains to be tested what would happen if the results of the ANP analysis portion of the ANP-Weighting Approach were different than those produced during the MAUT analysis portion. In other words, even though the priorities obtained from the outcome of the ANP analysis portion are plugged in as the weighting factors for the MAUT analysis portion, it is possible that the outcome of the MAUT analysis might wind up disagreeing with the ANP analysis. Unlike the Validation Approach and Iterative Approach, the ANP-Weighting Approach does not have a loop-back mechanism to encourage agreement between the different MCDM models. More research in this area may be warranted.

5.4. Addressing the Hypotheses

With due consideration of the discussion presented above, the null hypotheses given in CHAPTER 1 can now be satisfactorily addressed:

- The first null hypothesis, which posited that Microsoft Excel, as a DSS, could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected.
- The second null hypothesis, which posited that SuperDecisions, as a DSS, could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected.
- The third null hypothesis posited that there would be no significant difference between the DSS-modeled results of a standalone MAUT analysis and a standalone AHP analysis when applied to the problem statement. As evident by the research, the initial MAUT analysis and the initial AHP analysis produced different outcomes, therefore, this null hypothesis is rejected.
- The fourth null hypothesis, which posited that there would be no significant difference between the DSS-modeled results of a standalone MAUT analysis and those of the Iterative Approach hybrid analysis when applied to the problem statement, is rejected. As evident by the research, the initial MAUT analysis and the outcomes of the Iterative Approach produced different outcomes.
- The fifth null hypothesis, which posited that there would be no significant difference between the DSS-modeled results of a standalone MAUT analysis and those of the

ANP-Weighting Approach hybrid analysis when applied to the problem statement, is rejected. As evident by the research, the initial MAUT analysis and the outcomes of the ANP-Weighting Approach produced different outcomes.

- The sixth null hypothesis, which posited that there would be no significant difference between the DSS-modeled results of a standalone AHP analysis and the Iterative Approach hybrid analysis when applied to the problem statement, is rejected. Even though a few of the alternative rankings of the initial AHP analysis coincided with those that were produced from the AHP-style analyses conducted as part of the Iterative Approach, there were several notable differences that preclude this null hypothesis from being supported.
- The seventh null hypothesis, which posited that there would be no significant difference between the DSS-modeled results of a standalone AHP analysis and the ANP-Weighting Approach hybrid analysis when applied to the problem statement, is rejected. Even though a few of the alternative rankings of the initial AHP analysis coincided with those that were produced from the ANP-style analyses conducted as part of the ANP-Weighting Approach, there were several notable differences that preclude this null hypothesis from being supported.
- The eighth null hypothesis, which posited that MAUT could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected. Each variation and iteration of MAUT analysis conducted in this dissertation—all of which were established specifically to address the problem statement—was capable of

approximating the necessary parameters to address said problem statement. MAUT is a viable MCDM model for the needs of addressing the problem statement.

- The ninth null hypothesis, which posited that AHP could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected. Each variation and iteration of AHP analysis conducted in this dissertation—all of which were established specifically to address the problem statement—was capable of approximating the necessary parameters to address said problem statement. AHP is a viable MCDM model for the needs of addressing the problem statement.
- The tenth null hypothesis, which posited that ANP could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected. The two variations of ANP analysis conducted in this dissertation—both of which were established specifically to address the problem statement—were capable of approximating the necessary parameters to address said problem statement. ANP is a viable MCDM model for the needs of addressing the problem statement.
- The eleventh null hypothesis, which posited that in terms of the problem statement, a comparison between the MAUT model's global utility scores and the global priority outcomes of the ANP model would be impossible, is rejected. The outcomes of this dissertation and the comparisons made in CHAPTER 4 fully support the rejection of this null hypothesis.
- The twelfth null hypothesis, which posited that the hybrid Validation Approach could not approximate the necessary parameters needed to select a geographically appropriate

location for the relative natural background value for radon in air, is resoundingly rejected. As demonstrated, the Validation Approach is perhaps the most defensible and robust of the three hybrids evaluated in this dissertation and is quite capable of addressing the problem statement.

- The thirteenth null hypothesis, which posited that the hybrid Iterative Approach could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is resoundingly rejected. As demonstrated, the Iterative Approach is capable of addressing the problem statement.
- The fourteenth null hypothesis, which posited that the hybrid ANP-Weighting Approach could not approximate the necessary parameters needed to select a geographically appropriate location for the relative natural background value for radon in air, is rejected. While there are foreseeable outcomes that might result in inconclusive, or otherwise inconsistent outcomes, the ANP-Weighting Approach was able to adequately address the problem statement of this dissertation, which is sufficient to reject the null hypothesis.

5.5. Patterns Observed and Thoughts on Future Research

Regardless of which MCDM method or hybrid approach was used to address the problem statement of this dissertation, the basic process unfolded in a similar manner. In every case, the MCDM model began with a deep and detailed understanding of the problem statement. Data was collected. Assumptions were made. The decision problem was structured according to the protocols established by the respective MCDM method. Underpinned by the theories of rationalism and utilitarianism, logic was applied in developing utility values and preferences. The MCDM model was then executed and produced an outcome.

Resting on the shoulders of the research herein presented and the eleven now-rejected null hypotheses, a few conclusions can be drawn. First, it is apparent that any of the MCDM methods explored in this dissertation are capable of producing a rational, *defensible* outcome. Second, without the benefit of a second type of MCDM model for comparison (and in the absence of some sort of [very] introspective formal review process incorporated into the protocols for conducting a MAUT or AHP analysis), it is unknown by what means the outcomes a given MCDM model—conducted independently and in isolation—would be prompted to reconsider its inputs, weighting factors, or preferences. Based on what has evolved during the course of this dissertation, even a sensitivity analysis is not believed to be sufficient on its own to accomplish this. A decision-maker or group of decision-makers could just as easily accept their initial judgments as they could the results of a sensitivity analysis and just the same during any subsequent review of either of the two. In order to compel the type of reconsideration meant here, it would almost seem that something in the protocols of the decision-making process would need to cause decision-makers to re-evaluate some alternative version of the decision problem (as a means to implement a system of checks and balances), but if that were the case, would it not then be tantamount to conducting multiple MCDM analyses for the same decision problem anyway?

As far as this dissertation is concerned, it was only by virtue of the presence of multiple MCDM models, required by the Validation Approach and the Iterative Approach, that the weighting values used in the initial MAUT analysis became suspect. In the Validation Approach, it was because two out of the three MDCM models (*i.e.,* the AHP and ANP analyses) agreed, isolating the MAUT analysis, and therefore prompting closer scrutiny. During the testing of the

Iterative Approach, it was the AHP-style pairwise comparison of the MAUT weighting factors (that produced an intolerably inconsistent matrix) that prompted a second look at the MAUT analysis.

It is therefore a conclusion of this dissertation that there is superior benefit in the use of a combinational MCDM approach over a standalone one. Furthermore, while the value of MAUT cannot be understated, the fact that the AHP-style pairwise comparison produced a different [most] rational outcome even when using the initial MAUT weighting factors (and the further fact that this [most] rational outcome was repeated when using the weighting factors of the re-evaluated MAUT) presents an interesting and compelling case for the value that an AHP analysis offers, perhaps even to *any* decision problem.

Was the research presented in this dissertation really about geographic locations for an elusive radon background value? Well, after nearly 700 pages of effort seemingly pointing toward such, it might appear so, but there is a much longer game to play. Far from being the beginning, as formal MCDM goes back more than 70 years, but as an important step along the way, the work presented in this dissertation has the potential to be of utility far beyond the concerns of a relic uranium mill site in the American Southwest.

In CHAPTER 1 of this dissertation, a few examples were given that spoke to the generalizability of the new hybridized MAUT-ANP approaches presented in this dissertation. One example was given using a MAUT-ANP hybrid approach to identify the best location to plant soy beans another example was given regarding a national defense decision, and yet another example was given regarding an engineering consulting firm’s decision to expand its business prospects.

In this dissertation, a specimen case study was selected involving the selection of a geographically appropriate location indicative of the relative natural background value for radon, but even for this dissertation's problem statement, there were conceivably dozens of additional decision attributes that could have been considered for the specimen under study. It does not take any feat of imagination to contemplate how many decision attributes would be necessary to solve real-life decision problems.

Stepping out from the specifics of this dissertation, the benefits of using a combinational MCDM approach over a standalone one should be apparent for other environmental sites. The decision problem to "select a geographically appropriate location indicative of the relative natural background value for radon" can very easily be reduced to "select a geographically appropriate location for *just about anything*." Different data points, different physics, different engineering, different mechanics—different attributes, sure, but when a location is the answer to a decision problem, it seems that the effort and conclusions offered by this research may be of use.

Stepping out further, the notion of choosing a "background" value for something when an educated guess must be made is common in scientific research, environmental regulation, finance and financial regulation, medicine, engineering, business management, and *just about everything else*. With the preface that the phenomenon unto which a background value is desired to be ascribed has some confounding or otherwise inextricable component, then the term *background value*, in essence, becomes nothing more complicated than an assumption itself. Assumptions are made all the time in scientific research, so much so, that it would be difficult to find any scientific research that does not state assumptions.

In terms of environmental regulation, it is often desired to establish a background value for the concentration of one or more particular COCs—in air, in groundwater, surface water, waste streams, in flora, fauna, and ecosystems as a whole. Such efforts are nearly always complicated by the fact that human activity has interfered with the naturally-occurring levels of the particular

COC of interest, and much like the issue addressed by this dissertation's problem statement, a truly pre-anthropogenic value can never be known.

In terms of finance and financial regulation, there are conceivably many areas where the efforts and conclusions of this dissertation may find use. For example, the process by which central banks set interest rates is based on economic indicators and financial data, but just like ERG (2013), while the underlying data is generally honored (*i.e.,* not disputed), formal MCDM techniques are rarely used to establish rationality. As with most aspects of professional affairs, experts defend their decisions on the data, and while data is certainly a foundation for a rational decision, reliance on the data alone, without the aid of a formal MCDM, would seem justifiably insufficient. In fact, the entire system of fiat currency is based on nothing more than the trust of the nations who issue the currency, and on an international scale, the concept of Special Drawing Rights[108] is much the same—all based on the good faith and creditworthiness of the member nations who comprise it. All the same, whether a small town bank, a central bank, or an international financial institution, the decisions financial institutions make with respect to extending loans, what interest rates to charge, the creditworthiness of borrows—and what constitutes that creditworthiness, and even the value that a particular currency has, all rely on decisions.

Of particular interest for future research opportunities is the potential for the application of the hybrid approaches explored in this dissertation in the field of behavioral economics. According to several works on the subject, human decision-makers rely on mental shortcuts, mental filler

[108] Special Drawing Rights is a type of reserve currency created in 1969 by the International Monetary Fund to supplement the currencies of certain member countries. Special Drawing Rights is (not *are)* essentially a special type of artificial currency created to help settle international accounts. However, this system essentially enables the values of major currencies to "float" in value in terms of international exchange rates. The entire system of national currencies and Special Drawing Rights is fiat, meaning it has value based on the faith and credit of its constituent members (Investopedia, 2018).

material (*e.g.,* anecdotes and stereotypes), and irrational logic to make economic decisions. Things we often hold to be intuitive about decision-making do not always work the way we think they do. The combinational hybrid approaches explored in this dissertation may assist decision-makers make better decisions involving money and if nothing else, provide a better understanding of decisions that have already been made.

In terms of medicine, there are also numerous areas where the efforts and conclusions of this dissertation may be of use. For instance, in deciding which cancer drugs to fund, which wing of an aging hospital to repair first, which medical devices are most worthwhile to invest in or to determine which group of patients may benefit the most from a particular insurance plan, just to name a few.

In terms of engineering and engineering management, the value that a combinational MCDM hybrid approach are also manifold. Complex decisions are plentiful in the field of engineering and engineering management; decisions involving artificial consciousness, genetic engineering, cybersecurity, digital information and digital infrastructure, agricultural science, mining, space exploration and colonization, the best mode and method of carbon sequestration, environmental remediation, sea-level and storm surge protection, optimization of specialty satellites, or any number of other difficult decisions that engineering managers are currently facing represent the avant-garde of industry, science, government, and technology.

As a matter of perspective, the whole concept of an aggregative MCDM basically means the sum of the parts has to equal unity. However it gets sliced, whatever weights are applied, no matter how many attributes there are, everything has to add up to equal 1. MAUT, AHP, and ANP all force this basic premise on any decision problem. In fact, it is often precisely this concept that is violated when subject matter experts make decisions based solely on the data and do not take the time to elucidate rational decisions via a formal MCDM method.

Finally, it seems prudent to offer a brief note about the potential that this research bears with respect to computerized decision making, artificial intelligence, and artificial consciousness. It is the opinion of this author that there are profound future research opportunities for combinational MCDM approaches in these fields. By virtue of the validative qualities of combinational MCDM approaches, it is believed that artificial creations could make better decisions faster than humans ever could. The benefits of this are worthy of exploration as part of a separate research topic.

5.6. Conclusion

This dissertation began with a simple quest: find a way to make better decisions. This was accomplished by using the problem statement as a substrate upon which to compare and contrast MAUT, AHP, and ANP and test the three hybrid approaches. In setting forth the research parameters, presenting the basis for RDM and the selection of the MCDM methods to be used, conducting the literature review, developing and executing the MCDM models, and then evaluating them, not only was the problem statement definitively answered with respect to the null hypotheses and research limitations, but the bigger picture of the research also came into clearer focus. In practically every facet where a complex decision must be made, the benefits of a combinational MCDM hybrid approach would seem to have great potential across a multitude of technical and non-technical fields to minimize risks and maximize utility.

Additionally, while it certainly seems intuitive that a second rational opinion would be useful in a complex decision-making situation, it would seem that one case study is insufficient to prove the utility of the three combinational hybrid approaches that are herein advocated. More case studies are encouraged to assess the true utility of these approaches.

In terms of time management and efficiency of time utilization, on average, it took approximately 24 hours to create each separate MAUT, AHP, and ANP model. There was no significant difference in effort, or the time required between models developed in Microsoft Excel or SuperDecisions; about 24 hours each. As one might expect, creating the models was by far the most challenging aspect of the process. Executing the models took only a fraction of a second using a commercially available laptop computer with a 64-bit processor. Subsequent interpretation of the results for each model took, on average, an additional four to six hours. While there are an infinite number of What-If analyses that could have been performed, as presented in this dissertation, the broad sensitivity analysis categories took approximately eight hours to create in Excel for each of the MAUT and AHP models. The sensitivity analyses presented for the two ANP models were computed in a matter of two or three seconds by the SuperDecisions program and took no additional programming effort by the decision-maker.

With respect to the combinational hybrid approaches, in total, the ANP-Weighting Approach was the quickest, consuming only about 48 hours to create the models in Excel and SuperDecisions. Since the Validation Approach required an additional round of scrutiny due to the disagreement between the ANP and AHP results compared to those of the initial MAUT results, in all it took approximately 72 hours in all to create the models in their respective DSSs, with an additional eight hours for the scrutiny and interpretation of the results. Requiring nearly 84 hours in total, the Iterative Approach, unsurprisingly, required the most effort. This is due to the size of the matrix that was developed, as well as the fact that an intolerant CR was discovered when the initial MAUT data was programmed into the first rendition of the AHP-style pairwise comparison, which essentially compelled the creation of a second AHP-style pairwise comparison.

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APPENDIX A

SUPERDECISIONS PRINTOUT OF FINAL REPORT FOR INITIAL ANP MODEL RESULTS

Main menu for ANP Model PRACTICE COMPLETE_Iterative Approach.sdmod

- Outline
- Main Structures
- Report

Outline for ANP Model PRACTICE COMPLETE_Iterative Approach.sdmod

- *ANP Model PRACTICE COMPLETE_Iterative Approach.sdmod Model* alternatives follow:
    - Loc. 1
    - Loc. 1-Off
    - Loc. 1A
    - Loc. 2
    - Loc. 2-Off
    - Loc. 3
    - Loc. 3-Off
    - Loc. 4
    - Loc. 5
    - Loc. 6
    - Loc. 7
    - Loc. 16

Main structure of toplevel network

What follows a brief recap of this network.

If you would like to, you can return to the main menu.

Alternative(s) in it:	• Loc. 1 • Loc. 1-Off • Loc. 1A • Loc. 2 • Loc. 2-Off • Loc. 3 • Loc. 3-Off • Loc. 4 • Loc. 5

	• Loc. 6 • Loc. 7 • Loc. 16
Network Type:	Bottom level
Formula:	Not applicable
Clusters/Nodes	• **Alternatives:** *Location IDs: 1,2,3,4,5,6,7,1A,1-Off,2-Off,3-Off, 16* ◦ **Loc. 1:** *Location 1* ◦ **Loc. 1-Off:** *Location 1-Off* ◦ **Loc. 1A:** *Location 1A* ◦ **Loc. 2:** *Location 2* ◦ **Loc. 2-Off:** *Location 2-Off* ◦ **Loc. 3:** *Location 3* ◦ **Loc. 3-Off:** *Location 3-Off* ◦ **Loc. 4:** *Location 4* ◦ **Loc. 5:** *Location 5* ◦ **Loc. 6:** *Location 6* ◦ **Loc. 7:** *Location 7* ◦ **Loc. 16:** *Location 16* • **Distance from Anthropogenic Source:** *Measured distance (if feet) from an anthropogenic source.* ◦ **Distance from 4-Off:** *Distance (in feet) from 4-Off* ◦ **Distance from 5-Off:** *Distance (in feet) from 5-Off* ◦ **Distance from 6-Off:** *Distance (in feet) from 6-Off* ◦ **Distance from the LTP:** *Distance (in feet) to the LTP* • **Goal:** *Choose the most geographically appropriate location to represent the relative natural background value for radon in air.* ◦ **Goal Node:** *Choose the most geographically appropriate location to represent the relative natural background value for radon in air.* • **Meas. C(Rn-222):** *Measured Rn-222 Concentration Values* ◦ **Measured C(Rn-222):** *Measured value of Rn-222 in air* • **Relative Elevation:** *Elevation of the data points relative to one another* ◦ **Elevation:** *Measured elevation (in feet MSL) relative to every point.* • **W. Exp. (f) n:** *Wind Exposure as a function of wind speed* ◦ **4-Off, n-Cat I:** *0.5* ◦ ***4-Off, n-Cat II:*** *2.1* ◦ ***4-Off, n-Cat III:*** *3.6* ◦ ***4-Off, n-Cat IV:*** *5.7* ◦ ***4-Off, n-Cat V:*** *8.8* ◦ ***4-Off, n-Cat VI:*** *n>11.1* ◦ ***5-Off, n-Cat I:*** *0.5* ◦ ***5-Off, n-Cat II:*** *2.1* ◦ ***5-Off, n-Cat III:*** *3.6* ◦ ***5-Off, n-Cat IV:*** *5.7* ◦ ***5-Off, n-Cat V:*** *8.8* ◦ ***5-Off, n-Cat VI:*** *n>11.1* ◦ ***6-Off, n-Cat I:*** *0.5* ◦ ***6-Off, n-Cat II:*** *2.1* ◦ ***6-Off, n-Cat III:*** *3.6*

- ***6-Off, n-Cat IV:*** *5.7*
- ***6-Off, n-Cat V:*** *8.8*
- ***6-Off, n-Cat VI:*** *n>11.1*
- ***LTP, n-Cat I:*** *0.5*
- ***LTP, n-Cat II:*** *2.1*
- ***LTP, n-Cat III:*** *3.6*
- ***LTP, n-Cat IV:*** *5.7*
- ***LTP, n-Cat V:*** *8.8*
- ***LTP, n-Cat VI:*** *n>11.1*

Report for toplevel

This is a report for how alternatives fed up through the system to give us our synthesized values.
Return to main menu.

Alternative Rankings

Graphic	Alternatives	Total	Normal	Ideal	Ranking
	Loc. 1	0.0260	0.0528	0.3890	12
	Loc. 1-Off	0.0669	0.1357	1.0000	1
	Loc. 1A	0.0308	0.0625	0.4610	9
	Loc. 2	0.0274	0.0555	0.4093	11
	Loc. 2-Off	0.0448	0.0909	0.6701	4
	Loc. 3	0.0300	0.0609	0.4490	10
	Loc. 3-Off	0.0571	0.1158	0.8534	2
	Loc. 4	0.0419	0.0849	0.6262	5
	Loc. 5	0.0394	0.0799	0.5886	7
	Loc. 6	0.0397	0.0804	0.5930	6
	Loc. 7	0.0374	0.0758	0.5586	8
	Loc. 16	0.0517	0.1049	0.7733	3

APPENDIX B

SUPERDECISIONS PRINTOUT OF FINAL REPORT FOR SECOND ANP MODEL RESULTS

ANP File ANP Model PRACTICE COMPLETE_2.sdmod Page 1 of 3

Main menu for ANP Model PRACTICE COMPLETE_2.sdmod

- Outline
- Main Structures
- Report

Outline for ANP Model PRACTICE COMPLETE_2.sdmod

- *ANP Model PRACTICE COMPLETE_2.sdmod Model*
  alternatives follow:
  - Loc. 1
  - Loc. 1-Off
  - Loc. 1A
  - Loc. 2
  - Loc. 2-Off
  - Loc. 3
  - Loc. 3-Off
  - Loc. 4
  - Loc. 5
  - Loc. 6
  - Loc. 7
  - Loc. 16

Main structure of toplevel network

What follows a brief recap of this network.

If you would like to, you can return to the main menu.

Alternative(s) in it:	• Loc. 1 • Loc. 1-Off • Loc. 1A • Loc. 2 • Loc. 2-Off • Loc. 3 • Loc. 3-Off • Loc. 4 • Loc. 5

file:///C:/Users/JToepfer/AppData/Local/Temp/anp_image_temp0.html 1/9/2019

	• Loc. 6 • Loc. 7 • Loc. 16
Network Type:	Bottom level
Formula:	Not applicable
Clusters/Nodes	• **Alternatives:** *Location IDs: 1,2,3,4,5,6,7,1A,1-Off,2-Off,3-Off, 16* ◦ **Loc. 1:** *Location 1* ◦ **Loc. 1-Off:** *Location 1-Off* ◦ **Loc. 1A:** *Location 1A* ◦ **Loc. 2:** *Location 2* ◦ **Loc. 2-Off:** *Location 2-Off* ◦ **Loc. 3:** *Location 3* ◦ **Loc. 3-Off:** *Location 3-Off* ◦ **Loc. 4:** *Location 4* ◦ **Loc. 5:** *Location 5* ◦ **Loc. 6:** *Location 6* ◦ **Loc. 7:** *Location 7* ◦ **Loc. 16:** *Location 16* • **Distance from Anthropogenic Source:** *Measured distance (if feet) from an anthropogenic source.* ◦ **Distance from 4-Off:** *Distance (in feet) from 4-Off* ◦ **Distance from 5-Off:** *Distance (in feet) from 5-Off* ◦ **Distance from 6-Off:** *Distance (in feet) from 6-Off* ◦ **Distance from the LTP:** *Distance (in feet) to the LTP* • **Goal:** *Choose the most geographically appropriate location to represent the relative natural background value for radon in air.* ◦ **Goal Node:** *Choose the most geographically appropriate location to represent the relative natural background value for radon in air.* • **Meas. C(Rn-222):** *Measured Rn-222 Concentration Values* ◦ **Measured C(Rn-222):** *Measured value of Rn-222 in air* • **Relative Elevation:** *Elevation of the data points relative to one another* ◦ **Elevation:** *Measured elevation (in feet MSL) relative to every point.* • **W. Exp. (f) n:** *Wind Exposure as a function of wind speed* ◦ **4-Off, n-Cat I:** *0.5* ◦ ***4-Off, n-Cat II:*** *2.1* ◦ ***4-Off, n-Cat III:*** *3.6* ◦ ***4-Off, n-Cat IV:*** *5.7* ◦ ***4-Off, n-Cat V:*** *8.8* ◦ ***4-Off, n-Cat VI:*** *n>11.1* ◦ ***5-Off, n-Cat I:*** *0.5* ◦ ***5-Off, n-Cat II:*** *2.1* ◦ ***5-Off, n-Cat III:*** *3.6* ◦ ***5-Off, n-Cat IV:*** *5.7* ◦ ***5-Off, n-Cat V:*** *8.8* ◦ ***5-Off, n-Cat VI:*** *n>11.1* ◦ ***6-Off, n-Cat I:*** *0.5* ◦ ***6-Off, n-Cat II:*** *2.1* ◦ ***6-Off, n-Cat III:*** *3.6*

- ***6-Off, n-Cat IV:*** *5.7*
- ***6-Off, n-Cat V:*** *8.8*
- ***6-Off, n-Cat VI:*** *n>11.1*
- ***LTP, n-Cat I:*** *0.5*
- ***LTP, n-Cat II:*** *2.1*
- ***LTP, n-Cat III:*** *3.6*
- ***LTP, n-Cat IV:*** *5.7*
- ***LTP, n-Cat V:*** *8.8*
- ***LTP, n-Cat VI:*** *n>11.1*

- ***Windward Exposure:*** *Windward exposure from an anthropogenic source*
  - ***W. Exp. from 4-Off:*** *Windward exposure from the 4--Off*
  - ***W. Exp. from 5-Off:*** *Windward exposure from the 5--Off*
  - ***W. Exp. from 6-Off:*** *Windward exposure from the 6--Off*
  - ***W. Exp. from LTP:*** *Windward exposure from the LTP*

Report for toplevel

This is a report for how alternatives fed up through the system to give us our synthesized values.
Return to main menu.

Alternative Rankings

Graphic	Alternatives	Total	Normal	Ideal	Ranking
	Loc. 1	0.0233	0.0581	0.3201	12
	Loc. 1-Off	0.0729	0.1815	1.0000	1
	Loc. 1A	0.0268	0.0667	0.3672	10
	Loc. 2	0.0254	0.0633	0.3487	11
	Loc. 2-Off	0.0360	0.0897	0.4941	2
	Loc. 3	0.0282	0.0703	0.3871	9
	Loc. 3-Off	0.0358	0.0891	0.4910	3
	Loc. 4	0.0303	0.0755	0.4159	6
	Loc. 5	0.0288	0.0717	0.3948	8
	Loc. 6	0.0311	0.0773	0.4260	5
	Loc. 7	0.0289	0.0719	0.3960	7
	Loc. 16	0.0341	0.0849	0.4679	4

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