

The View Looking South from Cape Perpetua

Visual Resource Management System for the Oregon Territorial Sea

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Produced by the Department of Land Conservation and Development and the Oregon Parks and Recreation Department for use by the Territorial Sea Plan Advisory Committee and the Ocean Policy Advisory Council in the conduct of the Territorial Sea Plan Amendment Process.

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Introduction

The Oregon Coast is an internationally recognized tourist destination. Over 20 million visits occur to our coastal parks each year (OPRD, 2011). Scenic enjoyment is the 3rd most commonly stated primary recreational activity (following walking and stationary relaxing) that visitors say they engage in on Oregon's coastal beaches (Shelby and Tokarczyk, 2002). In addition, the Oregon Coast highway (Pacific Coast Scenic Byway) has been federally recognized by the National Scenic Byways program, established by Congress and administered by the U.S. Department of Transportation's Federal Highway Administration. In addition to being one of the first Scenic Byways in the country, it has also been designated an "All American Road", which recognizes US 101 as possessing "multiple intrinsic qualities that are nationally significant and have one-of-a-kind features that do not exist elsewhere (FHWA, 2011)." Oregon's coastline is also unique in that it has over 70 state parks running along the highway, providing "public access and resource protection in a way that is unrivaled by any other U.S. coastline park system (CH2MHill, 1997)."

Oregon's Statewide Planning Goal 19 states that agencies, through programs, approvals, and other actions, shall "protect and encourage the beneficial uses of ocean resources such as...aesthetic enjoyment." This is reiterated in Part 5 of the Territorial Sea Plan (TSP). Oregon's Ocean Shore Management Plan, a FERC approved "comprehensive plan" notes that Oregon Parks and Recreation Department (OPRD) "may identify important 'scenic features' that should be protected from development or other impacts for their scenic value (OPRD, 2005)." Recent public meetings underscored the importance of considering aesthetic (e.g., viewshed) impacts during the TSP amendment process. The Territorial Sea Plan Advisory Committee (TSPAC) assigned a subcommittee to work on the refinement of the visual resource management process. That subcommittee has worked on the adaptation of the original methods for the application of the system to Oregon's ocean environment. The methods described below are the product of that subcommittee and are under review by the TSPAC and OPAC as DLCD looks to finalize the TSP amendment process.

Background

There are several accepted methodologies for managing scenic resources used by federal land management agencies (BLM, 1980a; BLM, 1980b; USFS, 1995). These methods involve conducting inventories of scenic resources and evaluating potential changes based on established criteria and objectives. The degree to which a renewable energy facility (or other development) in Oregon's Territorial Sea impacts aesthetic recreational resources depends on a variety of factors, many of which are very similar to those used in the land-based scenic impact assessments. Modeling and slightly adapting these visual subordination standards for projects proposed in the Territorial Sea will allow the state to "provide time-tested qualitative benchmarks that can be measured using objective methods (Apostol, 2009)."

Methods

The Visual Resource Management System can be thought of as two discrete processes, the Planning Phase and the Project Phase. During the planning phase, work is done to collect baseline information and to adopt the standards that will be applied in any review of a project during the Project Phase. Those processes are

described below, as modified from the original methods for the application of the VRMS to marine renewable energy development applications within Oregon’s Territorial Sea.

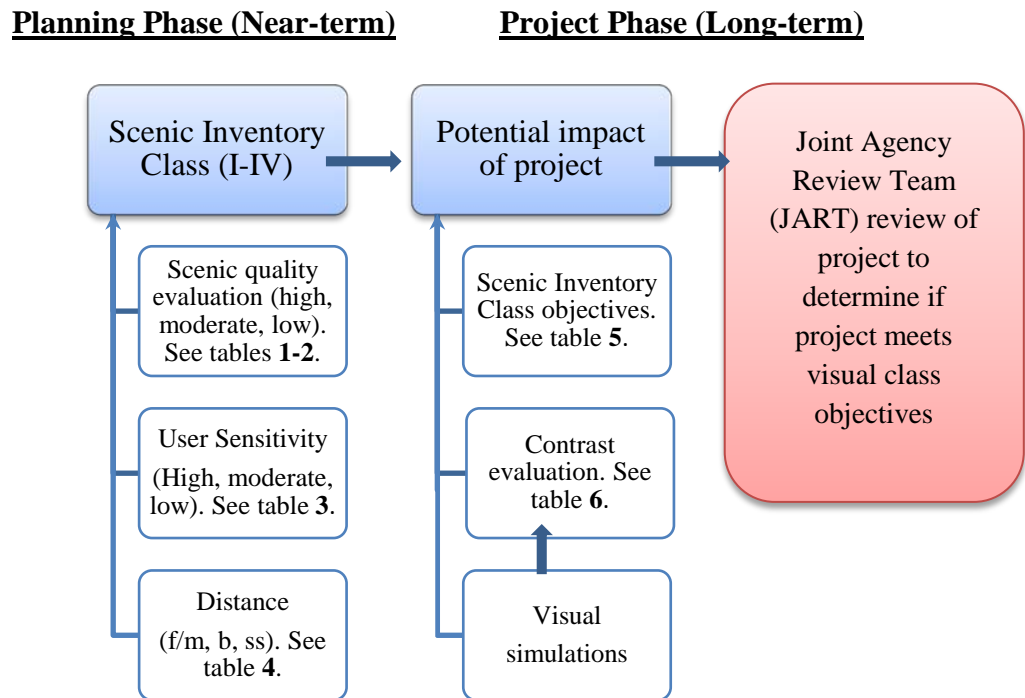


Figure 1. Scenic inventory and visual impact analysis overview (based on BLM methodology)

Planning Phase

Scenic Quality Evaluation

Scenic quality is a measure of the visual appeal of an area and its viewshed. Viewpoints are given an A, B, or C rating based on scenic quality which is determined using the following key factors: *seascape, vegetation, color, adjacent scenery, scarcity, and cultural modification* (BLM, 1980a). For the purposes of this document, *seascape* is defined as the coastal landscape and adjoining areas of ocean, including views from the land to sea and along the coastline (DTI, 2005). See [tables 1-2](#) for details.

The scenic quality evaluation and rating methods (Tables 1&2 below) were reviewed and approved by the TSPAC subcommittee on visual resources, after which time the visual resource inventories assessments were conducted to survey each site. This required field visits to viewpoints along the coast to gather detailed descriptions of individual viewpoints, GIS coordinates matched to a specific viewpoint/photo point, photos and other information necessary to determine scenic quality of the seascape at the viewpoints. For the purposes of our study the viewpoint locations were chosen based upon feedback from local cities and counties, from a public access point (e.g., state park), and were conducted in locations which would likely be viewed by the highest number of visitors. The draft results from the surveys are available for review in Appendix A.

Table 1. Scenic Quality-Explanation of Rating Criteria (modified from BLM, 1980a)

| Scenic Quality - Explanation of Rating Criteria | |
|--|---|
| Seascape/Landform | |
| | The ocean seascape, which includes adjacent topography and landforms, becomes more interesting as it gets more dramatic, or more severely or universally sculptured. Outstanding landforms may be monumental, as the coastal headlands, large offshore rocks and the Oregon coast range, or they may be exceedingly artistic and subtle as certain dunes, small offshore rocks and pinnacles, arches, and other extraordinary formations. Consider things such as shoreline type, offshore and onshore focal features, and elevation/slope. |
| Vegetation | |
| | Give primary consideration to the variety of patterns, forms, and textures created by plant life. Consider short-lived displays when they are known to be recurring or spectacular. Consider also smaller scale vegetational features which add striking and intriguing detail elements to the seascape. |
| Water | |
| | That ingredient which adds movement or serenity to a scene. The degree to which additional water features dominate the scene is the primary consideration in selecting the rating score. |
| Color | |
| | Consider the overall color(s) of the basic components of the seascape (e.g., soil, rock, vegetation) as they appear during seasons or periods of high use. Key factors to use when rating "color" are variety, contrast, and harmony. |
| Adjacent Scenery | |
| | Degree to which scenery outside the scenery unit being rated enhances the overall impression of the scenery within the area. The distance which adjacent scenery will influence scenery within the area will normally range from 0-5 miles, depending upon the characteristics of the topography, the vegetative cover, and other such factors. This factor is generally applied to units which would normally rate very low in score, but the influence of the adjacent area would enhance the visual quality and raise the score. |
| Scarcity | |
| | This factor provides an opportunity to give added importance to one or all of the scenic features that appear to be relatively unique or rare along the Oregon coast. There may also be cases where a separate evaluation of each of the key factors does not give a true picture of the overall scenic quality of an area. Often it is a number of not so spectacular elements in the proper combination that produces the most pleasing and memorable scenery - the scarcity factor can be used to recognize this type of area and give it the added emphasis it needs. |
| Cultural Modifications | |
| | Cultural modifications in the seascape, vegetation, and addition of structures should be considered and may detract from the scenery in the form of a negative intrusion or complement or improve the scenic quality of an area. |

Table 2. Scenic Quality Inventory and Evaluation Chart (modified from BLM, 1980a)

| Key factors | Rating Criteria and Score | | |
|-------------------------------|--|---|---|
| Seascape/ Landform | High vertical relief as expressed in prominent headlands, large rock outcrops, or severe surface variation; or detail features dominant and exceptionally striking and intriguing. 5 | Variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional. 3 | Few or no interesting seascape features. 1 |
| Vegetation | A variety of vegetative types as expressed in interesting forms, textures, and patterns. 5 | Some variety of vegetation, but only one or two major types. 3 | Little or no variety or contrast in vegetation. 1 |
| Water | Water is a dominant factor in the seascape. There are interesting and dominant water feature(s) (e.g., rivers, streams, waterfalls on cliffs, waves crashing on rocks) in addition to the ocean as part of the seascape. 5 | Flowing, or still, but not dominant in the seascape. There may be additional features but they are not dominant. 3 | There are no additional water features in the seascape. 0 |
| Color | Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, and water. 5 | Some intensity or variety in colors and contrast of the soil, rock and vegetation, but not a dominant scenic element. 3 | Subtle color variations, contrast, or interest; generally mute tones. 1 |
| Influence of adjacent scenery | Adjacent scenery greatly enhances visual quality. 5 | Adjacent scenery moderately enhances overall visual quality. 3 | Adjacent scenery has little or no influence on overall visual quality. 0 |
| Scarcity | One of a kind; or unusually memorable, or very rare along the coast. * 5+ | Distinctive, though somewhat similar to others along the coast. 3 | Interesting within its setting, but fairly common along the coast. 1 |
| Cultural modifications | Modifications add favorably to visual variety while promoting visual harmony. 2 | Modifications add little or no visual variety to the area, and introduce no discordant elements. 0 | Modifications add variety but are very discordant and promote strong disharmony. -4 |

NOTE: Values for each rating criteria are maximum and minimum scores only. It is also possible to assign scores within these ranges. * A rating of greater than 5 can be given but must be supported by written justification.

Scenic quality overall rating: A = 19 or more, B = 12-18.5, C = 11 or less.

User Sensitivity

Sensitivity levels are a measure of public concern for scenic quality. A sensitivity level analysis is conducted for public lands where they are assigned high, medium, or low sensitivity levels by analyzing various indicators of public concern. Rating is based on the following key factors: *type of users, amount of use, public interest, adjacent land use, special areas, and other factors* (BLM, 1980a). See table 3 for details.

The identification of user sensitivity, as described in Table 3 below, was a topic of much discussion at the subcommittee and after some consideration the group recommended that all locations within the TSP Visual Resources Inventory would be considered to have a “high sensitivity.” This recommendation was based upon both the type of users, amount of use and the public interest criteria.

The main concern in taking this action was that it would result in less flexibility when determining viewshed class values from the combination of scenic evaluation scores and distance classes. This concern was somewhat mitigated through a change in the scoring table (Table 5) which was made to account for the effect of distance on class values in the background and seldom seen areas of a Scenic Quality A viewshed and the addition of a “special areas” classification.

Table 3. Sensitivity criteria (modified from BLM, 1980a)

| |
|--|
| <p>a) Type of Users. Sensitivity will vary with the type of users. For example, recreational sightseers may be highly sensitive to any changes in visual quality. <i>Maintenance of visual quality is:</i></p> <ul style="list-style-type: none"> – a major concern for most users.....high – a moderate concern for most users.....moderate – a low concern for most users.....low |
| <p>b) Amount of Use. Areas seen and used by large numbers of people are potentially more sensitive. However, this is just one factor considered in sensitivity analysis because there are cases where few viewers may have high sensitivity (e.g., wilderness areas). Protection of visual values <i>usually</i> becomes more important as the number of viewers increase*.</p> <ul style="list-style-type: none"> – high level of use (500,000+ visitors/year).....high – moderate level of use (100,000-500,000 visitors/year).....moderate – low level of use (under 100,000 visitors/year).....low |
| <p>c) Public Interest. The visual quality of an area may be of concern to local, State, or National groups. Indicators of this concern are usually expressed in public meetings, letters, newspaper or magazine articles, newsletters, land-use plans, etc. Public controversy created in response to proposed activities that would change the seascape character should also be considered. <i>Maintenance of visual quality is:</i></p> <ul style="list-style-type: none"> – a major public issue.....high – a moderate public issue.....moderate – a minor public issue.....low |

| |
|--|
| <p>d) Adjacent Land Uses. The interrelationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the viewshed of a park area may be very sensitive, whereas an area surrounded by developed lands may not be as visually sensitive. <i>Maintenance of visual quality to sustain adjacent land use objectives is:</i></p> <ul style="list-style-type: none"> – very important.....high – moderately important.....moderate – slightly important.....low |
| <p>e) Special Areas. Management objectives for special areas such as parks, natural areas, wilderness areas, scenic areas, scenic roads or trails, and designated Historic Areas frequently require special consideration for the protection of the visual values. This does not necessarily mean that these areas are scenic, but rather that one of the management objectives may be to preserve the natural seascape setting. The management objectives for these areas may be used as a basis for assigning sensitivity levels. <i>Maintenance of visual quality to sustain special area management objectives is:</i></p> <ul style="list-style-type: none"> – very important.....high – moderately important.....moderate – slightly important.....low |
| <p>f) Other Factors. Consider any other information such as research or studies that includes indicators of visual sensitivity.</p> |

***Note:** These numbers were modified to accommodate the much higher use of Oregon’s coastal parks. The figures used by the BLM were much too low for coastal park visitation.

Distance zones

For classification, analysis, and simplification of data, seascapes are subdivided into distanced zones based on relative visibility from travel routes or observation points. The zones are: *foreground/midleground, background, and seldom seen* (BLM, 1980a). See [table 4](#) for details. For the purposes of modeling the viewshed classes the following distances were used for the zones listed above, respectively (f/m:0-5 miles, b:5-15 miles, ss:15 miles – horizon).

Table 4. Distance Zones (modified from BLM, 1980a)

| |
|--|
| <p>Foreground-Midleground Zone</p> <p>This is the area that can be seen from each travel route or observation point for a distance of 3 to 5 miles where management activities might be viewed in detail. The outer boundary of this distance zone is defined as the point where the texture and form of individual plants are no longer apparent in the seascape. In some areas, atmospheric conditions can reduce visibility and shorten the distance normally covered by each zone. Also, where the foreground-midleground zone from one travel route overlaps the background from another route, use only the foreground-midleground designation.</p> |
| <p>Background Zone</p> <p>This is the remaining area which can be seen from each travel route or observation point to approximately 15 miles. Do not include areas in the background which are so far distant that the only thing discernible is the form or outline. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark.</p> |
| <p>Seldom-Seen Zone</p> <p>These are areas that are not visible within the foreground-midleground and background zones and areas beyond the background zones.</p> |

Special Areas Determination

Special area management objectives for visual resources within the Territorial Sea did not previously exist. For the purposes of this system, a special area is defined as any site that scored higher than a 24 when evaluated for their scenic quality. This would objectively designate locations along the coast that had high intrinsic qualities and provide for an additional measure of protection for those “special areas” of Oregon’s Territorial Sea. A list of all sites and their scenic quality evaluation scores is shown in Appendix B.

Visual Resource Scenic Classes

Combine scenic quality and distance zone to determine visual resource classes (BLM, 1980b). See Table 5 for details. Geographic Information Systems modeling was conducted to produce a Visual Class Composite Viewshed Analysis Map (Appendix C).

- **Class I.** Class I is assigned to all *special areas* and to the fore and mid-ground (0-5mi) of a site designated Scenic Quality A.
- **Classes II.** Class II is assigned to the background and seldom seen areas of a Scenic Quality A viewshed and the fore and mid-ground of a site designated Scenic Quality B.
- **Class III.** Class III is assigned to the background and seldom seen areas of a Scenic Quality B viewshed and the fore and mid-ground of a site designated Scenic Quality C.
- **Class IV.** Class IV areas are located in the background and seldom seen areas of a Scenic Quality C viewshed.

Table 5. Visual Resource Class Derivation (modified from BLM, 1980a)— as modified by TSPAC.

| Special Areas | | I | I | I |
|----------------|-----------------------|--------------------|-------------|------------------------|
| Scenic Quality | A | I | II | II |
| | B | II | III | III |
| | | | | IV |
| | C | III | IV | IV |
| | | f/m (0 – 5 miles) | b (5-15 mi) | s/s (15 mi and beyond) |
| | Distance zones | | | |

Objectives for Visual Resource Classes (BLM, 1980a):

- **Class I:** The objective of this class is to preserve the existing character of the seascape. This class provides for natural ecological changes; however, it does not preclude very limited development activity. The level of change to the characteristic seascape must be very low and may not attract attention.
- **Class II:** The objective of this class is to retain the existing character of the seascape. The level of change to the characteristic seascape must be low. Development activities may be seen, and may attract minimal attention, but may not dominate the view of the casual observer.
- **Class III:** The objective of this class is to partially retain the existing character of the seascape. The level of change to the characteristic seascape may be moderate. Development activities may be seen, and may attract attention but may not dominate the view of the casual observer.

- **Class IV:** The objective of this class is to provide for activities which require major modifications of the existing character of the seascape. The level of change to the characteristic seascape can be high. These development activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Project Phase (i.e., when developments are proposed)

All applications for development will be required to complete a Visual Impacts Analysis (VIA) as part of application process. The VIA will combine the conduct of visual simulations, a contrast analysis, and an evaluation of Scenic Inventory Class objectives in the determination of the potential visual impact of a project within context of Oregon’s Territorial Sea. The applicant will be required to produce the elements of the VIA for review and evaluation by the TSP Joint Agency Review Team (JART) to determine whether the impact of the project aligns with the objective for that class of resource. This process will begin once an application for development has been received by the Department of State Lands and the JART has been convened. The process and methods for each step in the process is described below.

Visual Simulations

During the initial meeting of the JART, the project location will be reviewed in the context of the Visual Resource Inventory Assessment (VRIA) locations, and the JART will select Key Viewing Areas (KVAs) from these locations. The applicant will be required to conduct visual simulation(s) for the chosen KVA’s. These locations will be selected to represent the range of scenic quality class values and distances, if present. At a minimum, the KVA’s should include all VRIA locations where the application is within the fore and mid-ground distance.

Contrast Evaluation

The applicant will then conduct a contrast evaluation of the proposed development and draft a review of the impacts to the KVAs. Factors to consider will include (at a minimum): Distance from viewpoint(s), angle(s) of observation, time factor(s), relative size or number, seasonality, lighting, spatial relationships, atmospheric conditions, motion/lights/color, shore-based facilities. Table 6 provides a description of the contrast ratings that should be determined for the project, using the visual simulations produced as supporting evidence of the ratings.

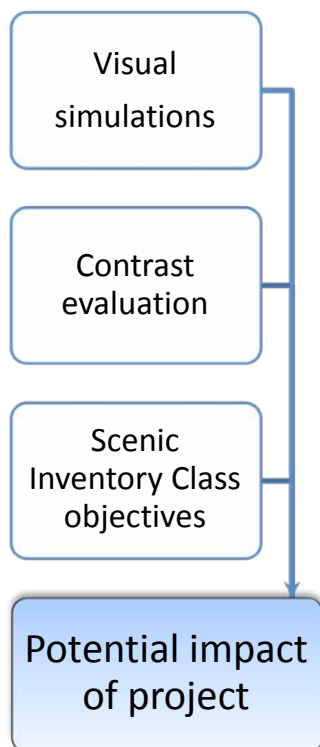


Table 6. Contrast rating criteria (modified from BLM, 1980b; USFS, 1995; DTI, 2005; Apostle, 2009)

| Degree of Contrast (BLM) | Criteria/Definition | Descriptors (DTI, 2005) | Notes |
|--------------------------|---|---|--|
| None | The element contrast would not be visible or perceived. There is no legible change. It is visually subordinate. | Weak, not legible, near limit of acuity of human eye | A development that remains sub-dominant (visually subordinate) may have a low to moderate impact, depending on the sensitivity of the viewpoint. However, even development with weak contrast at a <i>very high-quality viewpoint</i> with <i>high viewer sensitivity</i> may have high impacts on visual resources (Apostle, 2009). |
| Weak | The element contrast could be seen but isn't so prominent or contrasting that it attracts attention and becomes a dominant element. It remains subordinate. | Lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred, indefinite, subtle | |
| Moderate | The element contrast begins to attract attention and begins to dominate the characteristic seascape. Proposed development causes "moderate alteration to elements/features/characteristics of the baseline seascape or visual conditions...such that there is a distinct change (DTI, 2005)." It is no longer subordinate. | Noticeable, distinct, catching the eye or attention, clearly visible, well defined | A development that has moderate or strong contrast seen from a highly sensitive viewpoint or corridor would likely have a moderate to high impact (Apostle, 2009). However, development that has moderate contrast at a location with low sensitivity might have a low to moderate impact. |
| Strong | The element contrast demands attention, will not be overlooked, and is dominant in the seascape. It is no longer subordinate. Proposed development would cause very large "alterations to key elements/features/characteristics of the baseline seascape or visual conditions...such that there is a fundamental change (DTI, 2005)." | Commanding, controlling the view, foremost feature, prevailing, overriding | |

Factors to be considered. At a minimum, consider the following factors when applying the contrast criteria to the portion of the project that is visible (modified from BLM, 1980b):

- Distance from viewpoint. The contrast created by a project usually is less as viewing distance increases.
- Angle of Observation. The apparent size of a project is directly related to the angle between the viewer's line-of-sight and the slope upon which the project is to take place.
- Length of Time the Project Is In View. If the viewer has only a brief glimpse of the project, the contrast may not be of great concern. If, however, the project is subject to view for a long period, as from an overlook, the contrast may be very significant.
- Relative Size or Scale. The contrast created by the project is directly related to its size and scale as compared to the surroundings in which it is place. This should include consideration of size of the development (e.g., number of devices) along with size of the individual devices and associated structures along with layout and spacing. For example, minimizing horizontal spread of the layout may reduce contrast (DTI, 2005).
- Season of Use. Contrast ratings should consider the physical conditions that exist during the heaviest or most critical visitor use season.

- Light Conditions. The amount of contrast can be substantially affected by the light conditions. The direction and angle of lighting can affect color intensity, reflection, shadow, form, texture, and many other visual aspects of the seascape. Light conditions during heavy use periods must be a consideration in contrast ratings.
- Spatial Relationships. The spatial relationship within a seascape is a major factor in determining the degree of contrast. For example, projects in areas that are the “focus of key views” like a headland or large offshore rocks could have a higher contrast (DTI, 2005).
- Atmospheric Conditions. The visibility of projects due to atmospheric conditions such as fog or natural haze should be considered.
- Motion, lights and color. Movement and lighting draw attention to a project and vary depending on conditions and time of day and night. Surface treatment (e.g., color) may increase or decrease visibility.
- Shore-based facilities. Associated shore-based facilities (e.g., buildings, cables etc.) should also be considered in the visual impact analysis (DTI, 2005).

Scenic Inventory Class Objectives Evaluation

The applicant will provide an evaluation of the potential impact of the proposed development, using the visual simulations, contrast evaluation, and objectives of the scenic inventory classes to make a determination of standards compliance. This will include comparing visual contrast to the visual resource class objectives for each KVA location selected by the JART. The applicant should produce a table like the one below (Table 7) to assist the JART in their decision making process.

Table 7. Template for the Visual resource impact analysis

| Viewpoint | Class (I-IV) | Contrast (None-strong) | Impact (None, Low, Moderate, High) | Meets visual resource objectives (Y/N) |
|-----------|--------------|------------------------|------------------------------------|--|
| | | | | |

Joint Agency Review Team Review:

The JART will review the draft VIA products (visual simulations, contrast analysis, scenic class objectives determination) for completeness and accuracy and provide a recommendation to DSL for the approval or denial of the application based upon an evaluation of the VIA. Professional guidance should be provided to ensure thorough and accurate evaluations are done using photo evaluations, GIS simulations etc. (see Apostle, 2009 and DTI, 2005 for a start).

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