3.15 Visual Resources

3.15.1 Affected Environment

3.15.1.1 Overview

The study area for visual resources includes the proposed ROWs and groundwater development areas, and an additional 15 miles on all sides of aboveground facilities or to the horizon (**Figures 3.15-1** and **3.15-2**). This is the BLM background zone (15 miles) for visual resources analysis (BLM 1986a). In addition, the visual resources study area includes areas with phreatophytic (primarily shrubs and herbaceous species) and wetland/meadow vegetation (see Sections 3.5.1.2 and 3.5.1.3, Vegetation Resources; and **Figures 3.5-1, 3.5-2, 3.5-3** and **3.5-4**) associated with the region of study for vegetation types that may be affected by potential groundwater drawdown effects.

Public lands surrounding the proposed ROWs and groundwater development areas consist primarily of BLM-administered lands, although a short portion of Alternative D (Humboldt-Toiyabe Power Line Alignment) would cross USFS-administered lands. Management direction for maintaining the quality of scenic and visual resources is contained in the BLM RMPs and USFS Forest Plans governing the facilities' location and described in terms of the BLM VRM System and the USFS Scenery Management System. The VRM is based in part on the VRI, which identifies the baseline visual resources of an area.

QUICK REFERENCE

GBNP – Great Basin National Park
KOP – Key Observation Point
NPS – National Park Service
OHV – Off-highway Vehicle
SR – State Route
USFS – U.S. Forest Service
VQO – Visual Quality Objectives
VRI – Visual Resource Inventory
VRM – Visual Resource Management

Land Use Plans

- Las Vegas RMP – The Las Vegas Field Office VRM classes, or objectives, for portions of Clark and adjacent Lincoln counties are illustrated on **Figures 3.15-1** and **3.15-2** (BLM 1998). A VRI is being conducted, and available results as of March 2011 are illustrated in **Figures 3.15-3** and **3.15-4**. The VRI is anticipated to complete in fall 2011.
- Ely District RMP – The Ely VRM classes, or objectives, are illustrated on **Figures 3.15-1** and **3.15-2** (BLM 2008). A VRI is being conducted, and available results as of March 2011 are illustrated in **Figures 3.15-3** and **3.15-4**. The VRI is anticipated to complete in fall 2011.
- Humboldt-ToiyabeNational Forest Land and RMP – The Humboldt-Toiyabe National Forest Land and RMP contains visual quality objectives (VQO) for lands that would be crossed by Alignment Option 1 (Humboldt-Toiyabe Power Line Alignment).

Visual Resource Management

VRI for the Southern Nevada and Ely District provide a baseline scenic quality evaluation, a delineation of distance zones, and a sensitivity level analysis. Based on these three factors, BLM-administered lands are placed into one of four VRI classes that represent the relative value of the visual resources. Classes I and II are the most valued, Class III represents a moderate value, and Class IV is of least value. Inventory classes are informational in nature and provide the basis for considering visual values in the development of VRM classes. A summary of the available VRI for the Southern Nevada and Ely Districts can be found in Appendix F3.15.

Figure 3.15-1 BLM and U.S. Forest Service Visual Resource Objectives (North)

Figure 3.15-2 BLM and U.S. Forest Service Visual Resource Objectives (South)

Figure 3.15-3 BLM Visual Resource Inventory (North)

Figure 3.15-4 BLM Visual Resource Inventory (South)

The BLM and USFS visual resource objectives define the amount of disturbance an area can absorb before it no longer meets the objective for that area. The BLM VRM classes are assigned to the various landscapes in each of the BLM's resource areas. The VRM classes range from I to IV, with Class I being the most restrictive and IV being the least restrictive in terms of modifications to the quality of the resources. The objectives of the BLM VRM classes are described as follows:

BLM Visual Resource Management Classes

Class I – to preserve the existing character of the landscape.

Class II – to retain the existing character of the landscape. Changes should repeat elements in predominant natural features.

Class III – To partially retain the existing character of the landscape. Changes should not dominate the landscape.

Class IV – To provide for management activities that require major modification of the existing character of the landscape. The level of change can be high.

Class I – To preserve the existing character of the landscape. The level of change to the characteristic landscape should be low and must not attract attention.

Class II – To retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III – To partially retain the existing character of the landscape. The level of change to the characteristic landscape should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV – To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management 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.

The BLM visual resource objectives are not a reflection of scenic quality. Instead, they are management direction that may allow high levels of change on highly scenic lands if those lands are managed to less restrictive visual resource objectives.

Several segments of the proposed project have been co-located in the SWIP and LCCRA utility corridors, which have been designated VRM Class IV.

To manage scenic resources on public lands, the Humboldt-Toiyable National Forest uses a system similar to the BLM with visual quality objectives (VQOs) as management guidelines, with Preservation being the most restrictive and Maximum Modification being the least restrictive as shown in **Table 3.15-1**. The Alignment Option 1 route (Humboldt-Toiyabe Power Line Alignment) from Ely to Spring Valley follows a designated utility corridor adjacent to existing power lines in the Humboldt-Toiyabe National Forest. This designated utility corridor has visual resource objectives of partial retention, modification and maximum modification.

Table 3.15-1 Comparison of United States Forest Service Visual Quality Objectives and Bureau of Land Management Visual Resource Management Classes

USFS VQO Classes	BLM VRM Classes
Preservation	Class I
Retention	Class II[1]
Partial Retention[1]	Class II and III[1]
Modification[1]	Class IV[1]
Maximum Modification[1]	Not comparable to BLM classification. Maximum Modification allows activities that may not appear to completely borrow from naturally established form, line, color, texture, or scale (USFS 1974).

[1] Management objectives of public lands crossed by alternative corridors.

NPS visual quality objectives apply to NPS-managed lands. These lands are not directly affected by the proposed project. NPS management guidance contained in the enabling GBNP legislation, general management plan, and other documents regarding the preservation of scenic values, viewsheds and night sky conditions for the GBNP propose aspirations for lands outside of GBNP. The enabling legislation established the GBNP based in part on its "outstanding resources and significant geological and scenic values" (NPS 1986). Prior to its establishment as a national park, the area was managed by the USFS as the Wheeler Peak Scenic Area. The Great Basin National Park Management Plan explains that "views across Snake Valley and Spring Valley as visitors approach the park and from various locations within the park greatly enhance experiences and are a significant park resource." The Plan further states the planning objective to "minimize the adverse visual impacts of human activity on the Snake and Spring valleys" (NPS 1992). As described in *The Guide to Managing the National Park System* (NPS 2006), NPS management directive is to protect natural darkness and other components of the natural landscape in parks. As a result, NPS minimizes the light emanating from park facilities and seeks cooperation of park visitors, neighbors, and local government agencies to prevent or minimize changes to the pastoral basin scenes visible from the Park.

Special Management Areas and Sites

Four Nevada state-designated byways traverse portions of the ROW and groundwater development areas (NDOT 2009). No management plans for these scenic byways are included on the list of completed projects posted on the NDOT website.

- Baker Road (SR 487). Designated by the Director of the Department of Transportation on March 27, 2000. Location – Begins at the junction of U.S. 50/6 and ends at Nevada/Utah state line. (Distance = 11.6 miles).
- U.S. 50/6/93. Designated by the Director of the Department of Transportation on March 27, 2000. Location – Begins at the access road to the 3C Ranch (just south of Ely) and ends at the Nevada/Utah State line. (Distance = 63 miles).
- U.S. 93 (Nevada's first Scenic Byway). Location – Begins at the junction with SR 318 and ends at Majors Junction (U.S. 6/50). (Distance = 148.8 miles).
- Lehman Caves Road (SR 488). Designated by the Director of the Department of Transportation on March 27, 2000. Location – Begins at the junction of SR 487 and ends at the GBNP gate. (Distance = 5.4 miles).

Other Special Management Areas include:

- Mount Wilson Scenic Byway – a BLM-designated byway looping from Pony Springs at U.S. 93 to Pioche at U.S. 93. This byway lies beyond the middle ground (4 miles) of the GWD Project.
- The Silver State OHV Trail – a congressionally designated OHV trail system in Lincoln County that is crossed by the project as it runs near Pioche, Caliente, and Alamo.
- The Rainbow Canyon BLM Backcountry Byway — a BLM-designated byway looping near Caliente through Kershaw-Ryan State Park past the Caliente Construction Support Area.

The Great Basin National Heritage Area encompasses White Pine County, Nevada and Millard County, Utah and adjacent Indian reservations, and contains nationally significant archaeological, historical, cultural, natural and scenic features that characterize the Great Basin Area. The Great Basin National Heritage Route in the study area includes scenic western landscapes and nationally significant features that include museums and historic, and interpretive sites along U.S 50 and U.S 93 in White Pine County. The heritage area and route designation confer no authority to manage or regulate land use (Great Basin Heritage Area Partnership 2011).

3.15.1.2 Rights-of-way and Groundwater Development Areas

Visual resources within the GWD Project study area are influenced by a wide variety of characteristics (e.g., topography, geology, vegetation, hydrology). Much of the visual experience in the analysis area is dominated by the arid Great Basin landscape, as shown in **Figure 3.15-5**. The regional landscape is part of the Great Basin section of Fenneman's Basin and Range physiographic province, a vast desert area of the western U.S. extending from eastern Oregon to western Texas characterized by periodic mountain ranges separated by desert plain (Fenneman 1931). The

View from Wheeler Peak in GBNP looking toward Spring Valley (BLM 2010).

Key Observation Point (KOP) 28 located near Lehman Caves Road (SR 488) outside of the GBNP looking toward Snake Valley and the town of Baker.

Figure 3.15-5 Typical Views of the Basin and Range Physiographic Province with Sagebrush Covered Dry Valleys Enclosed by Alluvial Fans and High Ridges with Pinyon-Juniper Forests

basin topography of central Nevada is notable for a level playa, dry lakebed or stream course, enclosed by steeply rising, barren alluvial fans and bajadas (shallow slopes that lie at the base of rocky hills, where materials accumulate from the weathering of the rocks) and relatively high ridges in nearly every direction. The mountain ranges rise on both sides of the valleys and provide a scenic backdrop as viewed from U.S. 93, 50, and 6/50 and state highways (UT487, NV893, and NV894).

The study area contains minor human modifications north of Apex in the form of state highways, rural communities, and ranching activities evidenced by the presence of fences and dirt roads. The ON Line Transmission project consisting of an approximately 235-mile long 500 kV transmission line from the new Robinson Summit Substation in White Pine County to the existing Harry Allen Substation in Clark County (BLM 2010) is currently under construction and considered as a foreseeable project in the draft EIS. The transmission line will be comprised of 100-185 feet tall single-circuit steel H-frame and lattice towers. The project generally falls within the designated SWIP Utility Corridor, which is managed as VRM Class IV.

The ROWs for the Proposed Action and alternatives cross 13 valley floors extending from Las Vegas Valley on the south to Spring and Snake valleys in the northern portion of the study area (**Figure 3.0-1**). The proposed pipeline ROWs lie in the valley floors and parallel existing power lines and railroads in certain areas, while the power transmission lines traverse valley floors and cross mountain ranges.

Scenic Quality

Scenic quality is the measure of the visual appeal of a tract of land. The key factors in a landscape that affect existing scenic quality are landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification (BLM 1986b). A summary of the VRI scenic quality rating units affected by the proposed project can be found in **Table F3.15-1**.

Scenic Quality is often described as the overall impression retained after travelling through an area of land and is affected by factors such as landform, vegetation, water and color.

In the northern Great Basin portion of the project area, vegetation patterns are comprised of pinyon-juniper forests in the higher elevations with sagebrush and grasses in the valley floors. Pinyon-juniper communities are effective in screening some surface disturbances. Mojave Desert vegetation and Joshua trees add to the scenic quality of the southern project area. The proposed project crosses steep washes and arroyos, such as Big Springs Wash, and scenic areas such as Cave Valley, Conner Pass, the BLM lands east of GBNP, and some groundwater development areas are adjacent to designated wilderness areas and GBNP.

Distance Zones and Visibility

Landscapes are subdivided into 3 distance zones based on relative visibility from travel routes or observation points. Distance zones are delineated as part of a VRI, because it provides valuable information that is useful in the sensitivity analysis (see below). Foreground-middle-ground zones (the area that can be seen from an observation point for a distance of 3 to 5 miles) are more visible to the public and changes are more noticeable and are more likely to trigger public concern.

In the BLM VRM mapping process, no distinction is made between foreground and middle-ground distances. However, in this document, ‘foreground’ is used to refer to viewing distances under 0.5-mile; ‘middle-ground’ to distances between 0.5 and 4 miles, and ‘background’ to distances over 4 miles.

High visibility is a defining characteristic of the region’s landscape character. Generally, the vast, open nature of the analysis area provides for wide and distant vistas due to the large open areas of level topography and absence of intervening landscape features, especially from high elevations. According to the National Parks Conservation Association, the GBNP enjoys exceptional air quality allowing viewers to “see more than 186 miles, and occasionally views exceed 230 miles. Peaks in the GBNP enjoy expansive views of Spring and Snake Valleys” (NPS 2009). Wheeler Peak is designated as a Critical Viewing Area in the GBNP General Management Plan, and all exceptional resources associated with the Snake and Spring valley basins are considered critical to the visitor experience (NPS 1992).

The horizon is a significant aspect of all distant views, and the enclosed viewshed generally equates to a hydrologic basin. Field observations found that individual skylined features such as a communication or transmission tower can generally be discerned when extended above the horizon (i.e., skylined) up to 4 miles, when atmospheric conditions permit. Structures below the horizon line typically are not readily discernable up to 3 miles, as they blend with the forms, lines, colors, or textures of the background. The patterns (lines and forms) resulting from large-scale infrastructure projects features contrast with natural features and also can be distinguished by the human eye to the background distance zone (15 miles). When viewed from above, such as from mountain peaks, changes to valley floors appear more prominently than when the same change is viewed from the valley floors.

As a result, maintenance of visual resources is a concern from nearby and distant viewing locations, including views from federal lands with high visual resource values, federally designated recreation areas, GBNP, major transportation routes, and population centers such as Baker, Ely, and Las Vegas. Proposed facilities would be located within the foreground and middleground distance zone of areas identified as sensitive, including known travel routes, areas of human habitation, areas of traditional use, and special management areas (**Figures 3.9-1**, **3.14-1** and **3.14-2**).

High visibility and isolation from metropolitan areas provides exceptional opportunities for stargazing in the northern portion of the study area. GBNP contains some of the most pristine night sky views in the continental U.S. and one of the best opportunities for stargazing in the National Park System. Existing local light sources in the study area include the towns of Ely, Pioche, Panaca, Caliente, Hiko, Alamo, and Baker, Nevada. Regional light pollution sources also include Salt Lake City, Provo, St. George, and Cedar City, Utah and Las Vegas, Nevada (NPCA 2009). Nighttime ambient light levels vary depending on the age, condition, and general abundance of lighting sources present within a particular viewshed. Skyglow increases with proximity to the Las Vegas metropolitan area.

Sensitivity Levels

Sensitivity levels are the measure of public concern for scenic quality. Each viewer brings perceptions formed by individual influences: culture, visual training, familiarity with local geography, and personal values. User sensitivity levels are determined by considering use volume and user attitude at each observation point (BLM 1986a,b). A summary of the VRI sensitivity level rating units affected by the proposed project can be found in **Table F3.15-1**.

Use volume refers to the frequency of travel through an area (by road, trail, or river). Protection of visual values generally becomes more important as the number and frequency of viewers increase. The major travelways in the study area include federal and state highways including the four Nevada state-designated byways described above and shown on **Figure 3.15-1** and **3.15-2**. The Silver State Trail is also a popular, non-paved OHV system that traverses the project. Several segments of the Pony Express Trail in Cave Valley, Muleshoe Valley, and Dry Lake Valley traverse the project. Travelers make a deliberate routing choice based on the historical, cultural, and other attractions of scenic byways, as described in Section 3.18, Socioeconomics and Environmental Justice and Section 3.9, Recreation. Recreational travel patterns are highly dependent on these highways, the existing local road network, and gated access points.

User attitude is a measure of public concern for scenic quality. User attitude is dependent on factors such as the type of users, public interest, and adjacent land uses. Recreational users, especially those who are attracted to an area by its scenic quality and intact landscape character, tend to be highly sensitive to changes in visual quality. As described in Section 3.18, Socioeconomics and Environmental Justice, and 3.9, Recreation, the most popular recreational uses include OHV use, hunting and fishing, wildlife watching, hiking, and camping. Stargazing also is a popular activity: almost half of all visitors to the GBNP considered dark skies as an important or very important consideration in making their travel plans to go to GBNP (NPS 2007). Designated parks, wilderness areas, the Great Basin National Heritage Route, wildlife refuges and conservation areas on BLM, USFS, NPS, and state lands are regional destinations (**Figures 3.9-1**, **3.14-1** and **3.14-2**). Lands visible from but outside of designated special areas contribute to the quality of the recreational experience. For example, unobstructed views in Spring and Snake valleys are cited as extremely important to the visitor's experience at GBNP (NPS 1992). Visitation fluctuates seasonally and with holidays, with most tourism activity occurring within the 4-month period of June through September.

User attitude also is dependent on the level of public interest associated with the project and is affected by adjacent land uses. As only small portions of the study area are developed, with approximately 96 percent managed by the BLM and

relatively large portions designated as special management areas with a remote character, users typically are more sensitive to visual change in the study area.

Potentially sensitive areas for visual resources within four miles from proposed project facilities (ROWs, groundwater development areas) include wilderness areas, GBNP, scenic byways, and recreation use areas. Several organized recreation areas (e.g., day use areas, campgrounds) are within four miles of the transmission lines as described in Section 3.15.2, Environmental Consequences.

3.15.1.3 Region of Study

Groundwater-dependent vegetation on the valley floor and riparian vegetation along perennial streams, seeps and springs are scarce and generally attract attention in arid regions. As discussed in Section 3.3.1.4, Water Resources and Section 3.5.1, Vegetation, most of the surface water features and associated vegetation occur in the Spring, Snake, Steptoe, and White River valleys. Several larger spring complexes also occur in the Fish Springs Flat (Juab County, Utah) and Lower Muddy River (Clark County, Nevada) valleys. Most of the streams occur in Steptoe, Snake, and Spring valleys. Stream names are shown in Section 3.3, Water Resources, on **Figure 3.3.1-4** for Spring Valley and **Figure 3.3.1-5** for Snake Valley. Basin shrubland vegetation cover within the region of study is shown in **Figures 3.5-3** and **3.5-4**, Vegetation Resources.

3.15.2 Environmental Consequences

3.15.2.1 Rights-of-way

Issues

Project construction and facility maintenance would result in a permanently changed visual setting in visible portions of the study area. The following visual resource issues were evaluated as part of the impact analysis for construction and facility maintenance within the primary pipeline and power line ROWs:

- Short-term and long-term visual resource changes resulting from aboveground facilities, power lines, project surface disturbance, and construction-generated dust.
- Impact of potential light sources associated with aboveground facilities, particularly to viewers in GBNP and other public viewpoints.
- Impacts to public viewpoints visited by tourists and recreational users (e.g., GBNP, Great Basin National Heritage Route, Humboldt-Toiyabe National Forest, national wildlife refuges (NWRs), scenic byways, and other formal and informal recreational areas).
- Compliance of construction and maintenance of project facilities located on public lands administered by the BLM and USFS with visual resource objectives.

Most impacts to the recreational experience are of a visual nature and are addressed in this section as direct effects to visual resources. Other potential direct impacts to recreational use areas are discussed in Section 3.9, Recreation. Visual impacts to historic trails and context-sensitive cultural sites are addressed in Section 3.16, Cultural Resources.

Assumptions

The following assumptions were used in the impact analysis for visual resources:

- All action alternatives would result in some degree of visual change to the study area because most project components would be visible from some location even though they may be remote.
- The valley or basin boundaries naturally define viewshed boundaries. Multiple valleys (i.e., viewsheds) are visible from high elevation locations.
- For purposes of this analysis, potential effects or impacts are considered either construction or maintenance-related. Construction-related impacts are assumed to be short-term (visible during construction activities or up to 2 years); maintenance-related impacts (which include the aboveground facility operations) are assumed to be long-term (visible during all of the project's anticipated lifecycle). Although the overall project construction schedule may exceed 2 years, the spread of construction activities within a basin (i.e., viewshed) would be completed within a term less than 2 years (see SNWA POD construction schedule). The residual effects of restoration are described under 3.5 Vegetation as long-term (greater than 2 years) for perennial herbaceous species and are addressed under long-term visual effects.
- The evaluation assumes that ACMs and BLM BMPs would be implemented and restoration activities would be successful in mitigating long-term vegetation, riparian/wetland, noxious weeds, soil, and geology impacts. If restoration is not successful, then long-term visual resource impacts would be greater than described in this assessment.

Methodology for Analysis

Surface disturbance related impacts to visual resources within the ROWs were evaluated according to the following steps.

- Forty-one KOPs were identified by field reconnaissance with BLM staff and literature review (see **Appendix F3.15**).
- BLM contrast ratings (Form 8400-4) were prepared for all KOPs associated with each alternative to determine long-term compliance with management objectives and are included in **Appendix F3.15**. The contrast ratings

considered vegetation, viewer distance, use frequency, duration of view, relationship to constituent values, visual absorption capacity, and ACMs. **Appendix F3.15** also summarizes the magnitude and extent of the contrast ratings as none, weak, moderate, or strong.

- Photographic simulations were prepared for 11 KOPs where views of the alternatives: 1) would be most visible to the public; 2) were representative of project components; or 3) occurred in visually-sensitive locations such as near scenic byways and within VRM Class II areas. As shown in **Appendix F3.15**, the simulations were based on preliminary engineering information and prepared and evaluated in accordance with BLM Handbook H-8432-1.
- Viewshed analyses for each alternative power line were conducted using GIS to evaluate the overall visibility of proposed power line structures and specific effects to GBNP, scenic byways and recreation areas. The computer-generated viewshed mapping was projected based on the power line heights in **Table 2.5-3** and **Figure 2.5-4** using a 30-meter USGS digital elevation model out to a distance of 4 miles (middleground distance zone) and 15 miles (background distance zone). Due to the general absence of tall land cover that could alter the actual viewshed in this landscape, the topographically-generated viewshed mapping is considered generally accurate.

3.15.2.2 Proposed Action and Alternatives A through C

Construction and Facility Maintenance

Short-term and Long-term Visual Resource Changes within the ROWs and Project Facilities

The construction impacts associated with project development would be the same for the Proposed Action and Alternatives A through C. The anticipated time frame of proposed project construction is such that short-term visual impacts would likely be most pronounced during brief, yet intense periods of construction, followed by periods of inactivity in each valley. The proposed development within the ROW areas is described in detail in Chapter 2. The following major short-term construction activities would affect visual resources:

- Clearing, grading, construction of the pipeline, and restoration of the permanent and temporary ROW.
- Disturbance, occupancy, and restoration of 97 pipeline staging areas. Staging areas are planned to be placed approximately 3 miles apart, immediately adjacent to the pipeline ROW.
- Clearing, grading, and, in some cases, paving of access roads.
- Construction and occupancy of the Caliente Construction Support Area. Approximately 121 acres southwest of the Caliente area would be utilized for a variety of construction management and materials storage purposes.
- Construction of all aboveground facilities (pressure-reducing stations, pumping stations, regulating tanks, the buried storage reservoir, the water treatment facility, substations, transmission lines, communication facilities, and fencing).
- Disturbance, occupancy, and restoration of 19 plant nursery sites, totaling approximately 249 acres of temporary ROW.
- Disturbance, occupancy, and restoration of an undetermined number of construction camps.
- Construction and re-fill of 8 borrow pits, each approximately 7 acres in size.
- Increased vehicle traffic for worker access and large construction equipment (e.g., trucks, excavators, cranes, etc.) expected during construction. Increased traffic would produce visible activity and dust from disturbance of dry soils, which would impair viewing distances and coat vegetation.
- Increased human presence from the workforce at construction sites and staging areas, which generally are located in sparsely populated areas.

The following long-term components of the Proposed Action and Alternatives A through C would permanently modify visual resources:

- Revegetation and maintenance to the permanent ROW and temporary ROW;
- Three new pressure-reducing stations, approximately 7 acres for 2 of the stations and approximately 13 acres for the third;

- Five new pumping stations, which would vary between 24 to 40 feet above grade and would be collocated with other facilities such as an electrical substation and emergency generator;
- Six new regulating tanks, varying in size but averaging 5 acres each. Tanks may be between 130 and 200 feet in diameter and approximately 30 to 40 feet high;
- A new 40-million-gallon buried storage reservoir, belowground, in a covered concrete tank. The reservoir would be collocated with other facilities such as utility buildings and a maintenance yard in a 75-acre area;
- A new water treatment facility, with maximum building heights of 20 to 30 feet;
- New 230-, 69-, and 25-kV transmission lines. The 230-kV power poles are planned to be single, steel power poles approximately 100 feet in height; the 69-kV power poles are planned to be single, steel poles approximately 60 feet in height; the 25-kV power poles are planned to be single, wooden poles approximately 50 feet in height;
- Two new primary electrical substations (230- to 69-kV) and 5 secondary substations (69- to 25-kV);
- New access roads, paved and unpaved;
- New communications facilities;
- New fencing and lighting; and
- Increased vehicle traffic and human presence for operations along the ROW and access roads, which generally are located in sparsely populated areas. Depending on the nature of repairs, large construction equipment (e.g., trucks, excavators, cranes, etc.) would be expected. Increased traffic would produce visible activity and dust from disturbance of dry soils, which would impair viewing distances and coat vegetation.

Short-term visual impacts from vegetation clearing and potentially grading within the ROW would occur at all project areas due to project construction. Construction of the pipeline and access roads would result in a new continuous band of moderate to strong contrasting forms, colors, and textures compared to existing conditions.

Long-term visual impacts would result from pipelines' ROWs and access roads include new banded lines, colors, and textures on the landscape, depending on viewing position. Some pipelines and access roads would follow existing linear features (power lines, pipelines, roads, fences); in these cases, the contrast of a new line on the landscape would be reduced. The magnitude of project-related pipeline and associated disturbances generally increases as the project moves from its northern boundary to the south. When viewed from flat, lower elevations, linear surface disturbances (pipeline, ROW, roads) are generally screened by the average height of vegetation (2 to 5 feet) except when viewed parallel to the line of sight. In areas of rugged terrain, grading would level the uneven form of the landscape, which would create a weak to moderate contrast in form and texture depending on the ground surface. As the ROW parallels existing roads for the majority of the alignment, the duration of views towards the project would typically be high, and viewers would experience the project from multiple angles over long periods of travel (2 hours for viewers traveling at the 70 mph posted speed limit). Large areas of bare earth and establishing vegetation in the ROWs would be visible until the ROWs have been successfully revegetated. ROW-VEG-1: Green Stripping would be applied to ROWs that cross areas with a high risk of wildfire or weed infestation to create a fuel-break mix consisting of perennial species with low-flammability characteristics, and prevent halogeton, red brome, Russian thistle, and other weed species from spreading in Great Basin Desert low elevation shrubland. Where applied, green stripping has the potential to increase the long-term color and textural contrasts as plant structure and diversity may not emulate undisturbed areas. Implementation of SNWA ACMS for noxious weeds (ACMs A.1.5, A.1.26, A.1.35, A.1.82 through A.1.89, and A.2.12) and restoration (A.1.69 to A.1.81 [**Appendix E**]) would reduce the need for green stripping and the associated visual impacts.

BLM BMPs require that access roads minimize surface disturbance and take into account the character and steepness of the landform, natural contours, cut material, depth of cut, where the fill material would be deposited, and visual contrast (Ely District Approved RMP/ROD [BLM 2008]). Implementation of the SNWA ACMs for planning and permitting (ACM A.1.1 Construction Plan), clearing and grading (ACM A.1.20 through 23, 60, 66 to 68), storm water and erosion control (ACM A.1.55, 56, 66), restoration (ACM A.1.25, 27, 66 to 68), noxious weeds (82 to 89), restoration monitoring (ACM A.2.9 and 10), and visual resources (ACM A.11.1 through A.11.4) would help to offset the impacts

of road construction. Specific visual resource ACMs would paint cut rock faces in Pahranagat Canyon to reduce the visual contrast and restore the appearance of natural desert varnish (ACM A.11.4).

Short-term visual impacts from construction of new power lines and ROWs would include vegetation clearing, grading, pole erection, and conductor pulling. Areas around the base of new power lines would likely require minor grading and new or re-developed access roads. Where an access road does not exist, such as Conner Pass, a new access road would be constructed, resulting in new lines, colors, and textures on the landscape. New access roads on steep slopes would require switchbacks where alternate access is unavailable. Conductor pulling and tensioning equipment would be located at various sites along the power line. Depending on the terrain and the number of angles and dead-end sites, numerous pull sites would likely be needed. These construction activities and associated impacts would be most visible along those portions of the study area adjacent to federal and state highways, where project facilities would be visible in the foreground, and where the ROWs cross roadways.

Long-term visual impacts of new power lines and ROWs would create new lines, forms, colors, and structures on the landscape. The direct visual impacts of new power lines depend on the size of proposed power lines and the proximity to existing lines, forms, colors, and textures of the view. As a result, the single steel pole color and form of Proposed Action and Alternatives A, B, and C would contrast to the existing wood single-pole and H-frame power lines characteristic in this region. In general, strong form and line contrasts would be seen in the foreground and middleground of 230-kV power lines (with or without 69-kV and/or 25-kV underhangs) in Steptoe, Spring, Lake, Pahranagat, Coyote Spring, Delamar, Dry Lake, Hidden North, Garnet, and Las Vegas valleys. Contrasts would be lessened where the power lines parallel existing power line corridors. Less contrast would result from 69-kV, 25-kV, and 69-kV with 25-kV underhang power lines in Spring, Snake, Hamlin, and Cave valleys. Pinyon pine and juniper woodland vegetation more than 20 feet in height in higher elevations within the project ROW may need to be trimmed or removed to provide the necessary clearance. In certain areas, this would result in an open, linear feature in an area currently characterized by a closed canopy. The proposed Caliente construction support area would be located within an existing largely undeveloped industrial area, near the existing railroad tracks. The proposed pipe storage uses of this site would be similar in appearance to existing railroad support uses, such as those used for storing steel track and ties.

Specific SNWA visual resource ACMs would minimize the contrast of pumping stations, the water treatment facility/buried storage reservoir, and pressure reducing stations with the colors of the surrounding landscape through architectural details and painting (ACM A.11.1), but do not address how the visual contrasts of regulating tanks, communication facilities, project signage, roofs, fences, walls, aboveground tanks and pipes, and storage yard surfaces can be reduced through materials and color (**Figures 3.15-6** and **3.15-7**).

Residents and travelers in the foreground and middleground of Proposed Action and Alternatives A, B, and C would be able to see operation activities, which would be performed using vehicles and, at times, heavy equipment and cranes. Intermittent, annual maintenance activities would result in contrasts to the visual environment ranging from none to weak. Impacts to visual resources also are expected to be intermittent over the life of the project.

Conclusion. Short-term effects to the scenic quality and viewer sensitivity of the study area would result from the construction of the pipeline, aboveground facilities and power lines; project surface disturbance (ROW); increased vehicle traffic and increased human presence; and construction-generated dust. Project surface disturbance areas would require vegetation clearing, grading, occupancy, and restoration activities.

Facility operation and maintenance would locally change the long-term character of the landscape in most of the study area, which contains only minor human modification north of Apex. Long-term impacts to visual resources would consist of moderate to strong form, line, color, and texture contrasts of the revegetated pipeline ROW, access roads, transmission lines, and non-linear project components with the existing predominantly natural setting. Periodic vehicle and worker activity associated with operations and maintenance would be periodically visible.

KOP 11 Existing Conditions. Photo taken along existing road approximately 4 miles west of U.S. 93, looking east.

KOP 11 Photographic simulation of Lake Valley Pumping Station. Common to all action alternatives.

Figure 3.15-6 Key Observation Point 11

KOP 36 Existing Conditions. Photo taken along U.S. 93 approximately 15 miles south of Alamo, looking southeast.

KOP 36 Photographic simulation of Coyote Spring Valley Pressure Reducing Station. Common to all alternatives.

Figure 3.15-7 Key Observation Point 36

Proposed mitigation measures:

The following mitigation measures are not currently addressed in BLM BMPs or SNWA ACMs, and are intended to further reduce visual contrasts from ROW surface disturbance, power lines, non-linear project elements, and indirect OHV trail developments. Additional mitigation measures for vegetation resources (ROW-VEG-1) also would apply to visual resources.

ROW-VR-1: ROW Width Reduction. SNWA, in consultation with the BLM, will reduce the width of permanent ROW and temporary construction ROW to the smallest width feasible in Pahranagat Canyon, VRM Class II areas, and within 1,000 feet adjacent to scenic byways (U.S. 50/6/93) to minimize visual contrasts where feasible. The permanent and temporary ROW width can be reduced through narrower roads within the ROW, steeper trench walls, vertical trenching and/or trench boxes, and reducing the ROW width in relation to the size of the pipeline (e.g., a 16 inch pipeline would require less ROW than an 84 inch pipeline). Effectiveness: This measure may be highly to moderately effective in reducing visual contrast of the permanent and temporary construction ROW in visually-sensitive locations. Pahranagat Canyon, VRM Class II areas, and ROWs within 1,000 feet adjacent to scenic byways account for approximately 50 miles, or 15 percent of the project. For example, in the Pahranagat Canyon area and other locations where rock faces within the ROW would be cut for construction, reducing the facility area to the minimum necessary would reduce rock cuts and minimize surface disturbance, thereby avoiding strong contrasts. Effects on other resources: Application would result in beneficial effects to vegetation, geology, wildlife, and soil resources as surface disturbance and rock cuts would be reduced in specific locations.

ROW–VR-2: Power Line Structure Design. Where locating new power lines adjacent to existing lines, the existing pole type, color, and span length would be matched to the extent feasible. In areas where there are no existing power lines, SNWA would consult with the BLM during project design to select the most appropriate structure design from the following: wood H-frame structures or single steel poles for 230-kV power lines and single wood poles or single steel poles for 69-kV and 25-kV. All steel poles would be surfaced with Shadow Grey paint in sage/creosote plant communities and self-weathering Corten in pinyon pine plant communities. Effectiveness: This measure may be moderately effective in reducing the visual contrast of high-voltage power lines. Parallel lines which are not matched (in height, structure materials, span length, and location), appear uncoordinated and unnecessarily chaotic, and as such, draw additional attention. For new transmission corridors, structures should resemble the existing transmission structures in the vicinity. Utilizing wood H-frame and single, wooden poles and painted and self-weathering steel structures would reduce the industrial character of galvanized steel structures (see photographic simulations for KOPs 23 and 34 in **Appendix F3.15**). Effects on other resources: If selected by BLM, increased ground disturbance would result from application of H-frame structures compared to single steel poles. Wood power lines may also require a larger number of structures due to shorter span lengths. These design features would not affect other resource values.

ROW–VR-3: Power Line Conductor and Insulator Design. Conductors are recommended to be non-specular and non-reflective. Insulators shall be porcelain or polymer material to reduce reflection and refraction. Effectiveness: Reducing the reflectivity of conductors and insulators would reduce the glare generated by power lines and therefore reduce the distance from which power lines attract attention. Effects on other resources: Application of these design features may increase the risk of avian collisions and electrocution with power lines. SNWA, with approval by BLM, will determine to what extent bird diverters would be necessary to reduce bird collisions and electrocution (ACM A.5.8).

ROW–VR-4: Surface Treatment of Project Structures and Buildings. SNWA would consult with BLM on surface treatments. All aboveground, non-electric project structures and buildings will utilize architectural details and be painted or constructed of colored block to blend with the colors of the surrounding landscape, per BLM Manual 8400 – Visual Resources Management. Shadow Grey for sagebrush shrub and shrubland cover types and Beetle for pinyon-juniper woodland should be selected from the BLM Standard Environmental Colors Chart CC-001 (**Appendix F3.15, Figure F3.15-1**). Ground surfaces of permanent storage yards that will not be revegetated should have a top-dressing of two inches of dark colored aggregate to minimize color contrast. Non-reflective and non-glare paints will be utilized with proper treatment maintenance for the life of the project. Effectiveness: Treating all surfaces of all project structures and buildings visible to the public such that a) their colors minimize visual intrusion and contrast by blending with the landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances will completely mitigate color contrasts in the middleground and background. Residual visual contrasts of treated structures will remain though at a reduced intensity, since changes

from the form, line, and texture of proposed facilities cannot be completely mitigated by color. Effects on other resources: Application would not affect other resource values.

ROW–VR-5: Facility Siting. During project design and preparation of the detailed POD (ACM A.1.1), SNWA would review facility site locations with the BLM to determine if design features or adjustments could be made to limit the visibility of non-linear facilities. The collocation of facilities has been incorporated into the POD; however, further adjustments for the collocation of non-linear facilities with related project facilities or existing facilities would be reviewed with the BLM. Distance, terrain, and vegetation screening would be utilized to limit the visibility of non-linear facilities. Facility siting to minimize visibility would be subject to engineering and safety requirements that may constrain siting. Effectiveness: This measure may be moderately effective in reducing the overall visual contrast of facilities within the ROWs. Collocating proposed facilities with other proposed or existing facilities and collocating proposed facilities in previously disturbed areas would be moderately effective. Additive visual effects would occur but at a lesser degree of contrast as scenic integrity and landscape fragmentation would be reduced. For example, at the U.S. 93 crossing in Delamar Valley (**Appendix F3.15**, KOP 5 simulation), the Proposed Action and Alternatives A through C locate a primary electrical substation on the south side of the highway and a regulating tank site on the north side of the highway. Collocating the two facilities on the same side of the highway would reduce landscape fragmentation. Siting facilities behind terrain and vegetation, avoiding placement of buildings on high land features and along "skylines," and/or locating facilities more than 0.5 mile from designated viewing locations would conceal or reduce changes. For example, at KOP 11 in Lake Valley, a pumping station is located in a recently burned area at the crest of a slope which makes it appear skylined from U.S. 93 (scenic byway). Relocating the pumping station 2,500 feet to the west into the pinyon-juniper stands and behind the ridge would reduce visual contrasts. Proposed facilities would be less visible from viewpoints with high viewer sensitivity or high use volumes, but would remain visible for other viewers. Effects on other resources: Application could affect other resource values, if new locations contain other sensitive resources that would be impacted. The BLM would consider the effects of collocation and other adjustments on other resources values as part of their approval of the final facility sites in the detailed POD.

Additional KOP-specific mitigation measures are described where necessary in each Contrast Rating Form to reduce visual impacts further (see **Appendix F3.15)**.

Residual impacts include:

- Given climatic constraints on successful re-vegetation in the study area region, potential visual impacts resulting from changes in woody vegetation in disturbed areas would be visible in the long term until woody vegetation becomes re-established, especially in the linear pipeline/power line ROW.
- While texture and color contrasts might be partially mitigated by using appropriate earth-toned building materials and colors, in general, new buildings, structures, and their shadows would be prominent in the foreground.

Lighting Impacts

Some construction activities would occur during nighttime work shifts. Lighting needed to conduct construction (including drilling and pipeline construction) at night will be limited to the basic requirements to conduct the work and not onto surrounding areas and roads. BLM RMP BMPs and SNWA ACMs (A.11.2 and A.11.3) for nighttime lighting would minimize light requirements; utilize anti-glare light fixtures, shield and direct lighting downward during construction and operation, and either be manually controlled and used only when occupied or be motion activated if needed for safety and security. These protection measures would be effective in reducing the intensity and frequency of project lighting effects.

With implementation of BLM BMPs and SNWA ACMs during the construction period, impacts to nighttime scenic quality would be negligible and temporary. Lighting to support project operation would be needed throughout the life of the project and would likely be less intense and less frequent than the typical effects of a single family residence; therefore, new light sources would pose negligible impacts to nighttime viewsheds. No direct light sources (glare) would be visible from higher elevations. Indirect (rebound) lighting of project facilities may be seen, but would not attract the attention of the casual observer. The degree of contrast associated with nighttime lighting depends on proximity, the intensity of specific lighting sources, the viewer's desired experience, and the background or ambient level of combined nighttime lighting in the study area. For example, shielded lighting required for pumping and

substation facilities in Snake Valley would be substantially less in extent and intensity than the existing unshielded lights in the nearby towns of Baker and Garrison.

Conclusion. Exterior lighting for nighttime safety and security would be seen but would not attract attention during construction and project operations.

Proposed mitigation measures:

None.

Residual impacts include:

- Project aboveground facility light sources would be seen but would not attract attention, at an intensity less than the typical effects of a single family residence.

Impacts to Sensitive Viewpoints

Long-term effects would occur at designated recreation and viewing locations, such as scenic byways and recreation and wilderness areas. Recreationists in these areas expect to experience undeveloped or natural viewsheds with high scenic integrity and generally have high sensitivity to visual changes. **Table 3.15-2** shows the length of scenic byways where the power line would be visible within the foreground and middle-ground areas. The direct visual impacts within the viewshed of scenic byways depend on existing lines, forms, colors, and textures of the view, and are documented in **Appendix F3.15**: Visual Resources.

Table 3.15-2 Proposed Action and Alternatives A through C Power Line Impacts to Scenic Byways and Recreation Areas

Total Length (Miles) of Proposed Action and Alternatives A, B, and C Power Line	Scenic Byway Visible within 0.5 mile of Power Lines (Miles)	Scenic Byway Visible within 4 miles of Power Lines (Miles)
323	28	65

Of the 36 KOPs analyzed for the Proposed Action (the remaining 4 KOPs were analyzed for options), 15 would experience moderate to strong visual contrasts as a result of the Proposed Action and Alternatives A through C, as shown in **Appendix F3.15**, Visual Resources.

Recreation and wilderness areas visible within 4 miles of the Proposed Action and Alternatives A through C power lines include the following (see **Figures 3.9-1**, **3.14-1**, **3.14-2**):

- Arrow Canyon Wilderness Area;
- Baker Archaeological Site;
- Baking Powder Flat;
- BLM Elk Viewing and Interpretive Area off of U.S. 6/50/93;
- BLM Silver State and Rainbow Canyon Backcountry Byways (57 miles);
- Caliente SRP Area;
- Cave Lake State Park;
- Chief Mountain OHV Trail;
- Chief Mountain SRMA;
- Comins Lake bird-watching area;
- Delamar Mountains Wilderness Area;

- Far South Egans Range Wilderness Area;
- Fortification Range Wilderness Area;
- Great Basin National Heritage Area and Route;
- GBNP;
- High Schells Wilderness Area;
- Highland Ridge Wilderness Area;
- Kane Springs ACEC;
- Loneliest Highway SRMA;
- Mountain Grafton Wilderness Area;
- North Delamar SRMA;
- Pioche SRP Area;
- Silver State OHV Trail;
- Snake Creek Indian Burial Cave;
- Steptoe Valley WMA;
- Swamp Cedar Natural Area;
- USFWS Managed Lands (76,064 acres); and
- Wheeler Peak Critical Viewing Area.

Many of these recreation areas occur at higher elevations, such as wilderness areas and GBNP, and moderate to strong contrasts from new banded lines, forms, and colors would be visible.

A viewshed analysis for the proposed facilities within the ROWs and the groundwater development areas was prepared using GIS to identify all areas of the GBNP that would have views of proposed project activities. The computer-generated viewshed mapping was projected from power line heights based on **Table 2.5-3** and **Figure 2.5-4**, using a 30-meter USGS digital elevation model (DEM), out to a distance of 15 miles (background distance zone). Night lighting from construction and operation activities were not considered in selecting the viewshed analysis distance, as nighttime impacts would typically be negligible as described under Lighting Impacts.

The GBNP encompasses most of the South Snake Range, which is oriented north to south through the Park forming the divide between Spring Valley to the west and Snake Valley to the east. Most GBNP visitor facilities are on the east side of the Snake Range divide in Snake Valley. The majority of these facilities, roads, and trails are on north-facing slopes or in drainages and canyons with relatively enclosed viewsheds that do not provide views of the proposed project in Snake Valley. Evidence of visual change would be seen from the summit of Wheeler Peak, trails along the crest of the divide, a portion of the Wheeler Peak Scenic Drive, and other roads, trails, and dispersed recreational areas along the upper slopes of the Snake Range near the divide. These view points are located 10 or more miles from proposed ROW facilities in Snake Valley which would appear as an indistinct band of lighter, smoother vegetation and small block buildings. The project would not be visible from the Lehman Caves Visitor Center, the Lehman Caves, and primitive and developed campgrounds along the Snake Creek.

Evidence of visual change in Spring Valley would be seen from dispersed recreation areas on west aspects of the divide and high peaks, from Wheeler Peak summit, a portion of the Wheeler Peak Trail that extends north of the summit along the crest of the divide, and a primitive trail along the crest of the divide that extends south from a location above Baker Lake to Highland Ridge. These new points are located 10 or more miles from proposed ROW facilities and would overlook the project from a high elevation, with a distant view of project facilities. The project would appear as an indistinct band of lighter, smoother vegetation and small block buildings paralleling existing roads. No other defined view point areas would provide views of proposed activities in Spring Valley.

Outside of the GBNP, the proposed project would be visible to motorists on the main access road (SR 488) and Snake Creek Road west of SR 487 near the town of Baker.

Conclusion. Construction and long-term impacts would be visible from scenic viewpoints visited by tourists and recreational users within the foreground of scenic byways and recreation and wilderness areas. The proposed project would be visible along those portions of the study area adjacent to federal and state highways, where transmission lines or substations would be visible in the foreground, and where the project crosses roadways. The Proposed Action and Alternatives A through C would be highly visible within the foreground (0 to 0.5 miles) of approximately 28 miles of scenic byways and within the middleground (0.5 to 4 miles) of approximately 65 miles of scenic byways. Moderate to strong contrasts would occur at 16 of the 41 KOPs. ROW facilities would be located in a distant view (10 or more miles) from high points in GBNP.

When combined, these ROW area surface-disturbing activities would result in direct visual impacts. The scale of surface-disturbing construction activities, visibility adjacent to federal and state highways and scenic byways, and duration throughout the construction and undetermined operation periods would result in short- and long-term visual impacts.

Proposed mitigation measures:

- Application of Additional Mitigation Measures ROW-VR-1 through ROW-VR-5 (which is not currently addressed in BLM BMPs or SNWA ACMs) would reduce visual impacts to sensitive viewpoints from the Proposed Action, and Alternatives A through C.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

- The scale of linear aboveground and surface-disturbing activities (across more than 300 miles), high visibility from scenic byways and special designation areas, and duration within view (for 2 hours for viewers traveling on US 93 at the 70 mph posted speed limit) would result in long-term visual impacts from sensitive viewpoints.

Compliance with Visual Resource Objectives on Public Lands

In the short term, BLM VRM objectives would generally not be met during construction of the pipeline, power line, pipeline staging areas, , and Project facilities. Short-term changes are likely to be most pronounced during brief, yet intense periods of activity, followed by periods of inactivity.

The appearance of ROWs in the process of revegetation would result in strong color, line, and texture contrasts as seen long-term from scenic byways, recreation use areas, and KOPs. These contrasts would be prominent along adjacent highways and elevated KOPs.

The approximate number of acres potentially affected under the Proposed Action and Alternatives A, B, and C are listed in **Table 3.15-3** by BLM VRM Class. When considered in addition to the ON Line Transmission project in the Coyote Spring Valley, Delamar Valley, Dry Lake Valley, and Muleshoe Valley, the scale and height of this 500-kV power line would substantially reduce the form, line, color, and texture contrasts of the proposed power line and revegetated pipeline ROW and therefore would generally not dominate the view of the casual observer.

Table 3.15-3 Proposed Action, Alternatives A through C, Construction Surface Disturbance by Basin by VRM Class

Basins	VRM Classes			Total
	II	III	IV	
Cave Valley	0	0	712	712
Coyote Spring Valley	0	1,179	498	1,676
Delamar Valley	0	69	822	891
Dry Lake Valley	0	52	2,579	2,631
Garnet Valley	0	304	0	304
Hamlin Valley	0	0	384	384
Hidden Valley (North)	0	478	0	478
Lake Valley	0	0	804	804
Las Vegas Valley	0	158	0	158
Lower Meadow Valley Wash	0	0	0	0
Pahranagat Valley	0	10	242	252
Snake Valley	0	302	578	879
Spring Valley	79	208	2,280	2,568
Steptoe Valley	86	73	163	322
Total	166	2,833	9,061	12,060

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

Table 3.15-4 shows the length of BLM VRM Classes crossed by the Proposed Action and Alternatives A through C pipeline centerlines.

Table 3.15-4 Proposed Action, Alternatives A through C, Miles of Pipeline Centerlines Crossing VRM Classes

Basins	VRM Classes			Total
	II	III	IV	
Cave Valley	0	0	18.7	18.7
Coyote Spring Valley	0	26.5	12.5	39.0
Delamar Valley	0	2.7	20.4	23.1
Dry Lake Valley	0	2.1	67.6	69.7
Garnet Valley	0	7.1	0	7.1
Hamlin Valley	0	0	10.1	10.1
Hidden Valley (North)	0	12.2	0	12.2
Lake Valley	0	0	20.8	20.8
Las Vegas Valley	0	6.0	0	6.0
Pahranagat Valley	0	0.3	6.6	6.8
Snake Valley	0	8.0	15.5	23.5
Spring Valley	0.9	4.3	58.9	64.1
Steptoe Valley	0	0	0	0
Total	0.9	69.2	231.2	301.2

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

Table 3.15-5 shows the length of BLM VRM Classes crossed by the Proposed Action and Alternatives A through C power lines.

Table 3.15-5 Proposed Action, Alternatives A through C, Miles of Power Lines Crossing VRM Classes

Basins	VRM Classes			
	II	III	IV	Total
Cave Valley	0	0	18.8	18.8
Coyote Spring Valley	0	28.2	11.4	39.6
Delamar Valley	0	0	22.6	22.6
Dry Lake Valley	0	0	67.9	67.9
Garnet Valley	0	2.3	0	2.3
Hamlin Valley	0	0	10.1	10.1
Hidden Valley (North)	0	12.1	0	12.1
Lake Valley	0	0	20.8	20.8
Las Vegas Valley	0	0	0	0
Pahranagat Valley	0	0	6.0	6.0
Snake Valley	0	8.0	15.5	23.5
Spring Valley	4.7	7.2	58.9	70.9
Steptoe Valley	7.1	6.0	13.4	26.6
Total	11.9	63.9	245.3	321.1

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

As shown in **Tables 3.15-3** through **3.15-5**, the Proposed Action and Alternatives A through C cross BLM lands managed as VRM Class II in Spring Valley and Steptoe Valley as described below and in **Appendix F3.15**:

- Over Conner Pass between Spring Valley and Steptoe Valley, the proposed power line structures would create a new corridor ascending Conner Pass visible from KOPs 21 and 34. The clearing of existing shrubs and trees from the power line along the slopes of the ridge would create a path of disturbance; and steep terrain would require access road switchbacks and pads for power line structure construction. Pinyon-juniper community would effectively screen the cleared corridor, access roads, and lower portions of the power lines when not parallel to viewers. The power line would be visible from the scenic byway in Spring Valley, however the effect would be transient for vehicles traveling on the highway and management objectives for the VRM Class IV Spring Valley Utility Corridor would be met. Selecting the Humboldt-Toiyabe alternative transmission alignment option would have less of an impact on the landscape, because it follows an existing 230kV transmission corridor and the visibility from scenic byways would be less than the Proposed Action.
- In Steptoe Valley, the proposed power line would be seen 0.9 miles from KOP 29 (NDOW Elk Viewing and Interpretive Area) off of U.S. 6/50/93 (scenic byway), would not follow existing linear features, and would attract attention across the foreground, resulting in moderate form, color, and line contrasts that would not be compatible in a VRM Class II area. Selecting the Humboldt-Toiyabe alternative transmission alignment option would have less of an impact on the landscape, because it follows multiple existing 230kV transmission corridors and the visibility from scenic byways would be less than the Proposed Action.
- In Steptoe Valley, as seen from KOPs 29 and 31 along U.S. 6/50/93 (scenic byway) 7 miles west of Connor Pass, the proposed power line would roughly parallel the highway for 2 miles and cross it at an angle of about 35 degrees, continuing on in a predominantly north-south direction. This alignment and crossing, would dominate the landscape when travelling along the scenic byway in both directions, resulting in strong form and moderate color and line contrasts that would not be compatible in a VRM Class II and III areas. Selecting the Humboldt-Toiyabe alternative transmission alignment option would have less of an impact on the landscape, because it follows multiple existing 230kV transmission corridors and the visibility from scenic byways would be less than the Proposed Action.
- In Spring Valley, approximately 1 mile of power line and pipeline ROW would cross VRM Class II lands when the pipeline leaves the VRM Class IV LCRRDA utility corridor. The proposed project would not be visible from

scenic byways or major roads or KOPs. Viewers close to the project on BLM roads would notice the line, but would not likely have their attention unduly attracted. The noticeability of the line to viewers would diminish with distance, as it would increasingly blend with the background landscape. VRM II objectives for this area would be met. Through the application of Additional Mitigation Measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), the Proposed Action and Alternatives A through C would meet BLM VRM Class II objectives.

Evidence of landscape appearance changes from the proposed project ROWs in Snake and Spring valleys would be seen from high elevations such as Wheeler Peak within the GBNP, appearing as a band of lighter, smoother vegetation and small block buildings generally parallel to existing highways.

Conclusion. Construction activities would not be consistent with BLM visual resource objectives during the construction phase in VRM Class II portions of the Project study area. Approximately 170 acres of land classified as VRM Class II and 2,800 acres of land classified as VRM Class III would be affected by the construction of proposed Project facilities. The proposed pipeline would cross approximately 1 mile of land managed as VRM Class II and 69 miles of land classified as VRM Class III. The proposed power line would cross approximately 12 miles of land managed as VRM Class II and 64 miles of land classified as VRM Class III.

Evidence of landscape appearance changes from the proposed project in Snake and Spring valleys would be seen by viewers within the GBNP at a distance of more than 10 miles or more. These changes are not expected to meet the intent of NPS scenery management objectives.

Proposed mitigation measures:

- Through the application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), the Proposed Action and Alternatives A through C would meet BLM VRM Class objectives.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

- Although outside of the GBNP boundary, the Proposed Action and Alternatives A through C where seen from high elevations with a maximum view in GBNP such as Wheeler Peak would not meet the intent of NPS scenery management objectives.

3.15.2.3 Alternative D

The same ROW construction and operation types of effects discussed for the Proposed Action would apply to Alternative D, except that impacts would be limited to Clark and Lincoln counties (including Cave, Delamar, and Dry Lake valleys, as well as the Lincoln County portion of Spring Valley). Under Alternative D, approximately 8,700 acres would be affected across 225 miles of pipeline and 208 miles of power lines (compared to over 12,000 acres of surface disturbance, 306 miles of pipeline, and 323 miles of power lines under the Proposed Action). Impacts to views from GBNP would generally be avoided in Alternative D and NPS visual resource objectives would be met.

Short-term and Long-term Visual Resource Changes within the Rights-of-way and Project Facilities

Short-term effects to the scenic quality and viewer sensitivity of the study area would result from the construction of the pipeline, aboveground facilities and power lines; project surface disturbance; increased vehicle traffic and increased human presence; and construction-generated dust. Project surface disturbance areas would require vegetation clearing, grading, occupancy, and restoration activities. The scenic quality of approximately 8,700 acres across more than 200 miles would be affected in the study area.

Periodic vehicle and worker activity associated with operations and maintenance would be visible and produce dust on unimproved roads.

Proposed mitigation measures:

- Through the application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative D would reduce visual impacts.

Residual impacts include:

- Given climatic constraints on successful re-vegetation in the study area region, potential visual impacts resulting from changes in woody vegetation in disturbed areas would be visible for a long-term duration until woody vegetation becomes re-established, especially in the linear pipeline/power line ROW.
- While texture and color contrasts might be partially mitigated by using appropriate earth-toned building materials and colors, in general, new buildings, structures, and their shadows would be prominent in the foreground.

Lighting Impacts

Some construction activities would occur during night work shifts. Lighting needed to conduct construction (including drilling and pipeline construction) at night will be limited to the basic requirements to conduct the work. Lighting will be shielded, directed down towards the site and not into surrounding areas or onto roads, and either be manually controlled and used only when occupied or be motion activated if needed for safety and security (ACMs A.11.2 and A.11.3). These protection measures would be moderately effective by limiting the intensity and frequency of project lighting effects. Construction lighting would not permanently alter the nighttime viewshed and would not be significant.

Exterior lighting for nighttime safety and security would be activated by activity at the specific site and when activated would very briefly alter nighttime light conditions in the study area as viewed from scenic byways and recreation areas, federal and state highways, and specific KOPs. No aboveground facility lighting effects would occur in Snake Valley and the White County portion of Spring Valley.

Proposed mitigation measures:

None.

Residual impacts include:

- Project aboveground facility light sources would be seen but would not attract attention, at an intensity less than the typical effects of a single family residence.
- Impacts to Sensitive Viewpoints

Construction and long-term impacts would be visible from scenic viewpoints visited by tourists and recreational userswithin the foreground ***o***f scenic byways and recreation and wilderness areas, along those portions of the study area adjacent to federal and state highways, where transmission lines and ROWs or substations would be visible in the foreground, and where the project crosses roadways. Alternative D would be highly visible within the foreground (0 to 0.5 mile) of 1.5 miles of scenic byways, within the middleground (0.5 to 4 miles) of 9.8 miles of scenic byways and from the following recreation areas (see **Figures 3.9-1**, **3.14-1**, **3.14-2**):

- BLM Silver State and Rainbow Canyon Backcountry Byways (57 miles);
- Kane Springs ACEC;
- Chief Mountain OHV Trail;
- Chief Mountain SRMA;
- North Delamar SRMA;
- Caliente SRP Area;

- Pioche SRP Area; and
- USFWS Managed Lands (76,064 acres).

When combined, these ROW area surface-disturbing activities and nighttime lighting would result in direct visual impacts. The scale of surface-disturbing construction activities, visibility adjacent to federal and state highways and scenic byways, and duration throughout the construction and undetermined operation periods would result in short- and long-term visual impacts.

Proposed mitigation measures:

- Application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative D would reduce visual impacts to sensitive viewpoints.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

- Residual impacts would be similar to the Proposed Action and Alternatives A through C.

Compliance with Visual Resource Objectives on Public Lands

Compliance with BLM, USFS, NPS, and scenic byway visual resource objectives would be the same as the Proposed Action. Approximately 36 acres of land classified as VRM Class II, and 2,250 acres of land classified as VRM Class III would be affected by the construction of proposed project facilities as shown in **Table 3.15-6**. All KOP contrast ratings would meet BLM visual resource objectives.

Table 3.15-6 Alternative D, Construction Surface Disturbance Acres by Basin and by VRM Class

Basins	VRM Classes			Total
	II	III	IV	
Cave Valley	0	0	712	712
Coyote Spring Valley	0	1,179	498	1,676
Delamar Valley	0	69	822	891
Dry Lake Valley	0	52	2,579	2,631
Garnet Valley	0	304	0	304
Hamlin Valley	0	0	0	0
Hidden Valley (North)	0	478	0	478
Lake Valley	0	0	804	804
Las Vegas Valley	0	158	0	158
Lower Meadow Valley Wash	0	0	0	0
Pahranagat Valley	0	10	242	252
Snake Valley	0	0	0	0
Spring Valley	36	0	661	698
Steptoe Valley	0	0	0	0
Grand Total	36	2,251	6,318	8,605

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

Table 3.15-7 shows the length of BLM VRM Classes crossed by the Alternative D pipeline.

Table 3.15-7 Alternative D, Pipeline Centerline Miles by Basin and by VRM Classes

Basins	VRM Classes			Total
	II	III	IV	
Cave Valley	0	0	5.8	5.8
Coyote Spring Valley	0	24.3	5.6	29.9
Delamar Valley	0	0	7.1	7.1
Dry Lake Valley	0	0	0.7	0.7
Garnet Valley	0	0	0	0
Hamlin Valley	0	0	7.8	7.8
Hidden Valley (North)	0	4.8	0	4.8
Lake Valley	0	0	17.7	17.7
Las Vegas Valley	0	0	0	0
Pahranagat Valley	0	0.2	6.6	6.8
Snake Valley	0	7.6	15.5	23.1
Spring Valley	0.9	0	15.4	16.3
Steptoe Valley	0	0	0	0
Grand Total	0.9	36.9	82.2	120

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

Table 3.15-8 shows the length of BLM VRM Classes crossed by the Alternative D power lines.

Table 3.15-8 Alternative D, Power Lines Crossing Miles by Basin and by VRM Classes

Basins	VRM Classes			Total
	II	III	IV	
Cave Valley	0	0	5.9	5.9
Coyote Spring Valley	0	25.9	4.4	30.3
Delamar Valley	0	0	7	7
Dry Lake Valley	0	0	0.7	0.7
Garnet Valley	0	0	0	0
Hamlin Valley	0	0	7.9	7.9
Hidden Valley (North)	0	4.8	0	4.8
Lake Valley	0	0	17.7	17.7
Las Vegas Valley	0	0	0	0
Pahranagat Valley	0	0	6	6
Snake Valley	0	7.7	15.5	23.2
Spring Valley	1.2	0	15.1	16.3
Total	1.2	38.4	80.2	119.8

Note: The totals may be slightly different than the sum of each row and column due to rounding errors.

Proposed mitigation measures:

- Through the application of additional mitigation measures ROW-VR-1 through ROW-VR-7 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative D would meet NPS and BLM visual resource objectives.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

None.

3.15.2.4 Alternative E

The same ROW construction and operation types of effects discussed for the Proposed Action would apply to Alternative E, except that impacts would not occur in Snake Valley, ancillary facilities would be downsized, and three rather than five pumping stations would be required. Under Alternative E, approximately 10,450 acres would be affected by 258 miles of pipeline and 278 miles of power lines (compared to 301 miles of pipeline, and 321 miles of power lines under the Proposed Action). Impacts to views east of GBNP would be avoided in Alternative E.

Short-term and Long-term Visual Resource Changes within the Rights-of-way and Project Facilities

Short-term effects to the scenic quality and viewer sensitivity of the study area would result from the construction of the pipeline, aboveground facilities and power lines; project surface disturbance; increased vehicle traffic and increased human presence; and construction-generated dust. Project surface disturbance areas would require vegetation clearing, grading, occupancy, and restoration activities. No changes to scenic quality in Snake Valley would occur.

Facility operation and maintenance would substantially change the long-term character of the landscape in most of the study area, which contains only minor human modification north of Apex. Long-term impacts to visual resources would consist of moderate to strong form, line, color, and texture contrasts of the revegetated pipeline ROW, access roads, transmission lines, and non-linear project components with the existing predominantly natural setting. Periodic vehicle and worker activity associated with operations and maintenance would be visible.

Proposed mitigation measures:

- Application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative E would reduce visual impacts.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

- Given climatic constraints on successful revegetation in the study area region, potential visual impacts resulting from changes in woody vegetation in disturbed areas would be visible for a long-term duration until woody vegetation becomes re-established, especially in the linear pipeline/power line ROW.
- While texture and color contrasts might be partially mitigated by using appropriate earth-toned building materials and colors, in general, new buildings, structures, and their shadows would be prominent in the foreground.

Lighting Impacts

Some construction activities would occur during night work shifts. Lighting needed to conduct construction (including drilling and pipeline construction) at night will be limited to the basic requirements to conduct the work. Lighting will be shielded, directed down towards the site and not into surrounding areas or onto roads, and either be manually controlled and used only when occupied or be motion activated if needed for safety and security (ACMs A.11.2 and A.11.3). These protection measures would be moderately effective by limiting the intensity and frequency of project lighting effects. Construction lighting would not briefly alter the nighttime viewshed.

Exterior lighting for nighttime safety and security would alter nighttime light conditions in the study area during project operations as viewed from scenic byways and recreation areas, federal and state highways, as well as specific KOPs. No project lighting effects would occur in Snake Valley.

Proposed mitigation measures:

None.

Residual impacts include:

Project aboveground facility light sources would be seen but would not attract attention, at an intensity less than the typical effects of a single family residence.

Impacts to Sensitive Viewpoints

Construction and long-term impacts would be visible from scenic viewpoints visited by tourists and recreational users within the foreground of scenic byways and recreation and wilderness areas, along those portions of the study area adjacent to federal and state highways, where transmission lines or substations would be visible in the foreground, and where the project crosses roadways. Visibility of Alternative E from scenic byways and recreation areas would be the same as the Proposed Action except that the project would not be visible from KOPs 28, 30, 33, 34, 35, 37, 38, 50, 52, and 82.

When combined, these ROW area surface-disturbing activities and nighttime lighting would result in direct visual impacts. The scale of surface-disturbing construction activities, visibility adjacent to federal and state highways and scenic byways, and duration within throughout the construction period would result in short- and long-term visual impacts. These effects would also occur over the operation period, which is of an undetermined duration.

Proposed mitigation measures:

- Application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative E would reduce visual impacts to sensitive viewpoints.

Residual impacts include:

- Residual impacts would be similar to the Proposed Action and Alternatives A through C.

Compliance with Visual Resource Objectives on Public Lands

Compliance with BLM, USFS, NPS, and scenic byway visual resource objectives would be the same as the Proposed Action. The acres of VRM Class II, III, and IV lands impacted by Alternative E would be the same as the Proposed Action in all basins except Snake Valley, where no facilities would be constructed. Proposed mitigation measures:

- Through the application of additional mitigation measures ROW-VR-1 through ROW-VR-5 (which are not currently addressed in BLM BMPs or SNWA ACMs), Alternative E would meet BLM visual resource objectives overall and meet NPS visual resource objectives in Snake Valley.
- Additional KOP-specific mitigation measures are described in applicable contrast rating forms in order to reduce impacts further (see **Appendix F3.15)**.

Residual impacts include:

- Evidence of change from Alternative E would be seen from high elevations with a maximum view westward in GBNP such as Wheeler Peak, and would not meet the intent of NPS scenery management objectives. Views to the north and east of GBNP would meet NPS scenery management objectives because of natural screening, or because no facilities would be located in Snake Valley.

3.15.2.5 Alignment Options 1 through 4

Impacts for the alignment options (1 through 4) are identified in relation to the relevant segment of the Proposed Action in **Table 3.15-9**.

Table 3.15-9 Visual/Aesthetic Resource Impact Summary for Alignment Options 1 through 4

Alignment Option	Analysis
Alignment Option 1 (Humboldt-Toiyabe Power Line Alignment) **Option Description**: Change the locations of a portion of the 230-kV power line from Gonder Substation near Ely to Spring Valley. **Applicable To**: Proposed Action and Alternatives A through C and E.	Slightly smaller construction-related area of disturbance due to a reduction in the total length of the ROW corridor (12 miles versus 20 miles). Facilities would be detectable, with perceptible effects of disturbance from three KOPs (44, 45, and 46). USFS and BLM visual objectives would be met. Fewer ROW miles in BLM VRM Classes II (1.2 versus 11.9 miles) and III (55 versus 63.9 miles). Fewer ROW miles as viewed from scenic byways and recreation areas (0.5 mile radius – 21.6 versus 28.8 miles; 4 mile radius – 55.7 versus 65.5 miles). Less overall visual impacts compared to the Proposed Action as Alignment Option 1 would follow an existing transmission corridor and access road through a canyon, whereas the Proposed Action would create a new transmission corridor crossing a forested ridge within view of a scenic byway.
Alignment Option 2 (North Lake Valley Pipeline Alignment) **Option Description**: Change the locations of portions of the mainline pipeline and electrical transmission line in North Lake Valley. **Applicable To**: Proposed Action and Alternatives A through C and E.	A larger construction-related area of disturbance. Fewer ROW miles in BLM VRM Class II (10.7 versus 11.9 miles), but more within BLM VRM Class III (86.1 versus 63.9 miles). More ROW miles viewed from scenic byways and recreation areas (0.5 mile radius – 51.6 versus 28.8 miles; 4 mile radius – 83.5 versus 65.5 miles). Greater overall visual impacts compared to the Proposed Action as Alignment Option 2 power line, pumping station, and primary electrical station would be highly visible adjacent to a scenic byway.
Alignment Option 3 (Muleshoe Substation and Power Line Alignment) **Option Description**: Eliminate the Gonder to Spring Valley transmission line, and construct a substation with an interconnection with an interstate, high voltage power line in Muleshole Valley. **Applicable To**: Proposed Action and Alternatives A through C and E.	No impacts to BLM Class II and III lands and scenic byways between Gonder and Spring Valley versus the Proposed Action power line. Fewer ROW miles in BLM VRM Classes II (1.2 versus 11.9 miles) and III (55 versus 63.9 miles). Fewer ROW miles as viewed from scenic byways and recreation areas (0.5 mile radius – 24.4 versus 28.8 miles; 4 mile radius – 46.5 versus 65.5 miles). The Muleshoe Electrical Substation would be collocated with a Pressure Reducing Station, thereby reducing overall visual changes. Less overall visual impacts compared to the Proposed Action as Alignment Option 3 would eliminate 34 miles of power line and access road impacts between Gonder and Spring Valley and 138 kV power lines would replace 230 kV power lines along the main alignment.
Alignment Option 4 (North Delamar Valley Pipeline and Power Line Alignment) **Option Description**: Change the location of a short section of mainline pipeline in Delamar Valley to follow an existing transmission line. **Applicable To**: All alternatives.	Less overall aboveground and surface disturbance visual impacts compared to the Proposed Action as Alignment Option 4 would be located adjacent to an existing transmission line and cross a shorter distance (by 2 miles).

3.15.2.6 No Action

Under the No Action Alternative, the proposed Project would not be developed, would not contribute to visual changes, and would not contribute to visual resource cumulative effects in the analysis area. Rural landscapes crossed by the proposed project facilities would likely remain undeveloped and relatively unchanged because the majority of the land is federal. Development within the LCCRDA corridor would affect visual resources in both Lincoln and Clark counties, though potential effects would likely be less noticeable since new development would occur within an

existing linear feature on the landscape. Future projects, potentially including energy generation, transmission projects, and commercial/residential development, could occur within the analysis area, depending upon national energy supply and demand and other factors. These future potential projects could alter the visual character of the analysis area, thereby contributing to cumulative effects.

3.15.2.7 Alternative Comparison of Visual Resource Impacts for Construction and Facility Maintenance

A comparison of visual resource impacts is shown in **Table 3.15-10**.

Table 3.15-10 Comparison of Visual Resource Impacts from Proposed Action, Alternatives A through E

Parameter	Proposed Action, Alternatives A through C	Alternative D	Alternative E
Surface Disturbance in VRM Class II Areas (Acres)	166	36	166
Surface Disturbance in VRM Class III Areas (Acres)	2,833	2,251	2,531
Miles of Pipeline Crossing VRM Class II Areas (Miles)	1	1	1
Miles of Pipeline Crossing VRM Class III Areas (Miles)	41	29	34
Miles of Power Lines Crossing VRM Class II Areas (Miles)	12	1	12
Miles of Power Lines Crossing VRM Class III Areas (Miles)	64	43	56
Miles of Power Lines within the Foreground of Scenic Byways (Miles)	29	2	29
Miles of Power Lines within the Middleground of Scenic Byways (Miles)	66	10	66
KOP Contrast Ratings Comply with VRM Class II and III Objectives?	Yes with application of mitigation measures	Yes	Yes with application of mitigation measures

Note: The totals for miles and acreages may be slightly different than presented elsewhere in text due to rounding errors.

3.15.2.8 Groundwater Development and Groundwater Pumping

Issues

The primary visual issues and concerns associated with the construction and operation of the proposed project are the same as the issues identified for the ROWs analysis; the following additional issues are specific to groundwater development:

Groundwater Field Development Construction and Facility Maintenance

- Short-term and long-term visual resource changes resulting from aboveground facilities, power lines, project surface disturbance, and construction-generated dust.
- Impact of potential shielded light sources associated with aboveground facilities.
- Impacts of the project to public viewpoints visited by tourists and recreational users (e.g., GBNP, Humboldt-Toiyabe National Forest, NWRs, scenic byways, and other formal and informal recreational areas).
- Compliance of construction and maintenance of project facilities located on public lands administered by the BLM with visual resource objectives.

Groundwater Pumping

- Potential changes in landscape appearance (primarily valley floors) as the result of groundwater drawdown (due to vegetation transition that would likely occur in wetland/meadow and basin shrubland areas; see Chapter 3.5).

Assumptions

The assumptions used in the analysis for impacts to visual resources from groundwater development and pumping are the same assumptions that are listed in the analysis for ROWs in Section 3.15.2.1; the following additional issues are specific to groundwater development:

Groundwater Field Development Construction and Facility Maintenance

- The Ely District and Las Vegas RMP management actions and best management practices would be applied to all proposed construction activities, based on the most current RMPs – Ely District 2008; Las Vegas 1998 (BLM 2008, 1998).
- The ACMs included in the SNWA POD to manage surface disturbance effects for ROWs provide a basis for appropriate measures that may be submitted in future SNWA ROW applications. For purposes of impact analysis, it has been assumed that measures appropriate for ROW construction would be applied to ROW construction in groundwater development areas.
- Assumptions about the potential changes in water dependent resources from groundwater pumping do not incorporate additional assumptions about the effects of climate change because specific long term effects of climate change are not presently known, and the incremental contribution of climate change effects to project effects cannot be reasonably estimated. A general discussion of climate change effects is provided in Section 3.1.3.2, Climate Change Effects to All Other Resources.

Methodology for Analysis

- The methods outlined under ROWs were applied to project surface development activities; and
- Where it is determined that vegetation on valley floors could decline due to groundwater pumping (see Section 3.5, Vegetation Resources), the change in landscape appearance was estimated and compared to visual resource objectives for compliance. The types of impacts are described in general terms with impact indicators. Where BLM BMPs and SNWA ACMs may not adequately reduce impacts, additional mitigation recommendations and avoidance criteria are provided.

3.15.2.9 Proposed Action

Groundwater Development Area

Future site-specific impact assessments will assess visual impacts for specific project facilities in detail as the locations of facilities become better defined.

Short-term and Long-term Visual Resource Changes Resulting From Construction and Operation of Aboveground Facilities

As described in Chapter 2, Section 2.5.2, a total of 174 groundwater wells could be constructed under the Proposed Action with between 10 and 93 planned in each of the five hydrologic basins including: Spring Valley (75 to 93 wells), Snake Valley (39 to 48 wells), Cave Valley (10 to 11 wells), Dry Lake Valley (10 to 11 wells), and Delamar Valley (10 to 11 wells).

Well drilling is anticipated to last approximately 30 days per well. Construction of all well sites proposed under the project could take 20 or more years to complete, though specific projects would likely be completed intermittently during this time frame (i.e., construction would not be constant over a 20-year period). Wells are also assumed to be located at least 1 mile apart, and may be clustered in well fields of grids up to 4 wells. Visible grading for each well site would require a 1.5 acre permanent ROW with an additional 0.5 acre temporary construction ROW. Visible well site components within the well pad would consist of an aboveground well housing that would be constructed from concrete blocks. Even with the anticipated construction time frame, all construction-related visual resource impacts are considered short term; there would be no long-term construction-related impacts to visual resources in the study area.

Major construction activities associated with the groundwater development areas would likely include vegetation disturbance and removal, road building or upgrading, and development of well sites (drilling of the well and construction of associated well housing). These activities are similar to those described under ROWs above, except with smaller power lines, pipeline ROWs, and new wells. In general, construction in the groundwater development areas would also introduce visual contrasts similar to those previously described for ROWs, as well as a relatively high degree of human activity compared to the current conditions. Impacts are dependent on the location and visibility of roads and well pads in relation to the volume and sensitivity of viewers. In general, the magnitude of visual impacts would be greater in those basins with a higher number of proposed groundwater production wells (Spring and Snake valleys) compared to those with fewer proposed wells (Cave, Dry Lake, and Delamar valleys).

The construction activities would require work crews, vehicles, and equipment that would temporarily add to the visual impacts associated with construction of the proposed project, similar to those described under ROWs above, except with smaller power lines, pipeline ROWs, and new wells. Increased vehicle traffic for worker and staff access and large construction equipment (e.g., trucks, excavators, cranes) would be expected during construction, as well as future operations and maintenance activities. Increased traffic would produce visible activity and dust from disturbance of dry soils, impairing viewing distances and coating vegetation. Suspension and visibility of dust would be influenced by the number of vehicles, speed, road surface materials, and weather conditions (see Air Quality, Section 3.1). Additionally, construction materials would be visible during construction.

The following long-term components of the Proposed Action would permanently modify visual resources:

- Up to 174 permanent, graded wellpad ROWs of 1.5 acres each;
- Well housings on each wellpad constructed of concrete block;
- Revegetation of up to 2,727 acres of temporary ROWs adjacent to each wellpad;
- Revegetation and maintenance of up to 5,537 acres of permanent ROWs;
- Up to 434 miles of existing, new, or improved access roads to each wellpad located within the collector pipeline ROWs;
- Up to 434 miles of aboveground 25 kV power lines, with 50 feet of permanent ROW;
- Up to 434 miles of collector pipelines ranging from 10 inches to 30 inches in diameter;
- Up to 145 staging areas of 1 acre each;

- Two secondary substations to reduce power from 69 kV to 25 kV;
- Three hydroturbine energy recovery facilities;
- Two future pumping stations to convey water into the main and lateral pipelines, approximately 5 acres each of permanent and temporary ROW; and
- Communication facilities and fiber optic cables (installed underground) along access roads and on wellpads.

In its ACMs, Appendix E of the POD (SNWA 2011), SNWA would implement its ROW ACMs to future ROWs including production wells, collector pipelines, and associated facilities; locate collector pipelines, distribution power lines, and secondary substations along existing roads or other utility alignments, as feasible, which would reduce landscape fragmentation (ACM B.1.3); paint or use colored block to blend well housings with the colors of the surrounding landscape (ACM B.1.4); and minimize nighttime lighting (ACM B.1.4).

Long-term surface disturbance impacts would be similar to ROW area impacts described above, but the scale of power lines and collector pipelines would result in smaller disturbance areas. Since the well housings generally would have low profiles (i.e., only 1 story/10 feet high), visual impacts from surface disturbance would largely be screened by the average height of vegetation (2 to 5 feet) when viewed from lower elevations. When viewed from higher elevations, the well pads would appear as geometric squares and the access roads as linear ribbons, in a grid-like pattern of roads and wellpads on a homogeneous valley floor where not collocated along existing roads and other utility alignments. Cut and fill required for wellpads on slopes above 5 percent would attract attention within the foreground-middleground. New aboveground power lines would have similar effects as those described for ROWs; they would be apparent in the foreground, and would increase the contrast of access roads and collector pipelines.

Within the groundwater development areas, periodic vehicle and worker activity would be expected for operations and maintenance purposes. The frequency would be less than during construction. Except during periods of major maintenance, temporary visual impacts similar to those described under construction impacts above would be anticipated.

Lighting Impacts

Short-term and long-term lighting impacts would be similar to ROWs described above.

Impacts to Sensitive Viewpoints

Construction and long-term impacts would be visible from scenic viewpoints visited by tourists and recreational users within the foreground of scenic byways and recreation and wilderness areas, adjacent to federal and state highways, where distribution power lines or substations would be visible in the foreground, and where the project crosses roadways.

Compliance with Visual Resource Objectives

Most of the groundwater development areas are located in VRM Class III and IV areas and generally construction activities are considered consistent with these VRM classes As identified in **Table 3.15-11**, a portion of the proposed groundwater development actions are located in VRM Class II areas, particularly in the Cave, Dry Lake, Snake, and Spring valleys. As described in Chapter 2, a small fraction of the groundwater development areas would be reserved for temporary and permanent ROWs. Construction activities in these areas would likely be seen and attract the attention of observers at KOPs, creating potential short-term conflicts with VRM Class II objectives.

Table 3.15-11 Groundwater Development Areas within BLM VRM Classes (Acres), Proposed Action

VRM Classes	Cave Valley	Delamar Valley	Dry Lake Valley	Snake Valley	Spring Valley	Total
I	0	402	0	0	0	402
II	5,912	0	3,486	474	13,539	23,412
III	819	41,877	50,398	41,377	247,763	382,234
IV	28,056	29,611	114,885	50,208	100,197	322,955
Grand Total	34,787	71,889	168,769	92,059	361,499	729,003

Note: Only a fraction of the groundwater development areas would be reserved for future facilities.
The totals may be slightly different than the sum of each row and column due to rounding errors.

Groundwater production wells generally are considered consistent with the visual resource goals of VRM Classes III and IV (see Section 3.15, Affected Environment) with application of BLM BMPs, except from elevated locations where a maximum view of facilities within a basin occurs. Effects would be most apparent in Spring Valley and Snake Valley where the majority of facilities would be located. In areas classified as VRM Class I and II, unmitigated production wells would constitute an impact concern for visual resources.

Groundwater development activities would be visible primarily from trails and roads located along the Snake Range divide and the upper slopes of the range. Snake Valley groundwater facilities (ROWs, well pads) are estimated to be located 10 miles or more (measured horizontally) from the Mt. Wheeler summit viewing areas in GBNP. Spring Valley groundwater facilities could be viewed as close as three miles (measured horizontally) from the Mt. Wheeler summit viewing area.

Other GBNP facilities are located on north-facing slopes or in drainages and canyons with enclosed viewsheds and would not be affected by views of groundwater development activities. Groundwater development activities in the Spring and Snake valleys (these are outside of the GBNP boundary) would not meet the intent of NPS scenery management objectives.

Groundwater development activities would not be consistent with BLM visual resource objectives in the portions of the Delamar Valley (402 acres) classified as VRM Class I. Unless sited and screened from view, activities would also not be consistent with those portions of Spring (13,539 acres), Snake (474 acres), Cave (5,912 acres), and Dry Lake (3,486 acres) valleys classified as VRM Class II. Long-term surface disturbance impacts would be similar to ROW area impacts described above, but the scale of power lines and collector pipelines would result in smaller disturbance areas. Since the well housings generally would have low profiles (i.e., only 1 story/10 feet high), visual impacts from surface disturbance would largely be screened by the average height of vegetation (2 to 5 feet) when viewed from lower elevations. When viewed from higher elevations, the well pads would appear as geometric squares and the access roads as linear ribbons, forming a grid-like pattern of roads and wellpads on a homogeneous valley floor. Cut and fill required for wellpads on slopes above 5 percent would attract attention within the foreground-middleground. New aboveground power lines would be apparent in the foreground and increase the contrast of access roads. In general, buildings and structures would contrast moderately to strongly in form, line, color, and texture with the existing and generally natural landscape.

Conclusion. Development of the groundwater development areas would change the visual setting in the study area subsequent to, and in addition to, the action alternatives for the proposed ROW facilities. Impacts from construction, operations, and maintenance are dependent on the location and visibility of future facilities in relation to the volume and sensitivity of viewers. Development of up to 174 well sites would affect the overall visual landscape in each of the five hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 5,537 acres of permanent ROW, 2,727 acres of temporary ROW, and up to 145 staging areas. Increased vehicle traffic for worker access and large construction equipment (e.g., trucks, excavators, cranes, etc.) would be expected during construction. Increased vehicle traffic from worker access and movement of construction equipment would produce visible activity and dust from soil disturbance, which would impair viewing distances and coat vegetation.

It is assumed that SNWA would implement ROW ACMs, including its commitment to locate collector pipelines, distribution power lines, and secondary substations along existing roads or other utility alignments to use VRM compatible paint and materials for aboveground structures, and to minimize nighttime lighting. Further, in future site-specific NEPA analyses, SNWA would implement additional mitigation recommendations to: 1) avoid locating groundwater production wells on slopes greater than 5 percent; 2) bury distribution power lines; 3) utilize terrain and distance to screen groundwater development facilities from sensitive viewpoints; and 4) avoid siting facilities in BLM VRM Class I and II areas. Assuming implementation of these measures, it is expected that groundwater field development construction and facility maintenance would meet VRM Class objectives.

Proposed mitigation measures:

GW-VR-1: Avoid Siting Facilities on Slopes. Where determined necessary by BLM for visual resource protection, groundwater development facilities would not be located on slopes greater than 5 percent. Effectiveness: Siting facilities in areas that avoid creating cut and fill slopes would be highly effectively in reducing or avoiding visual impacts and decrease the magnitude of landscape fragmentation. Effects on other resources: None.

GW–VR-2: Install Distribution Power Lines Underground. Where determined necessary by BLM for visual resource protection reasons, distribution power lines (voltages less than 33 kV) would be placed underground, when not located within high voltage transmission corridors. Underground power lines can be located within the 100-foot ROW with a minimum separation in accordance with the National Electric Safety Code Standard 353. Underground power lines should be located within the disturbed area of the permanent ROW to minimize soil disturbance and visual contrasts to the extent feasible. Effectiveness: Undergrounding distribution power lines would completely eliminate aboveground power line visual impacts as distribution level voltages account for all of the power lines in the groundwater development areas. The need to underground distribution power lines located outside of disturbance areas would be determined with BLM as a line of soil disturbance and vegetation removal would result from grading of the power line ROW. Effects on other resources: Application would result in beneficial effects to vegetation, avian species, and some wildlife. There would be no implementation effects from this measure, if underground power lines are located within other disturbed project areas. Where located outside of disturbance areas, there would be increased effects to vegetation, wildlife, and soils until vegetation has been re-established. In general, groundwater buildings and structures would contrast moderately to strongly contrast in form, line, color, and texture with the existing and generally natural landscape due to the built structures' rectilinear geometry, symmetry, and surface characteristics.

GW-VR-3: Site Wellfield Facilities away from Designated Viewing Locations. Where determined necessary by BLM for visual resource protection reasons, site groundwater development production wells, staging areas, and pumping stations more than 0.5 mile from designated viewing locations with high viewer sensitivity (e.g., scenic byways, KOPs, wilderness areas and national parks) except where they are within the temporary and permanent ROW for the main or lateral pipelines or collocated with ROW facilities. Utilize terrain to screen groundwater development facilities and avoid placing buildings on high land features and along "skylines" to conceal or reduce changes. Effectiveness: This measure would be moderately effective. Siting facilities in areas that utilize terrain and vegetation screening or that locate structures and facilities more than 0.5 mile from designated viewing locations would mitigate visual impacts. Proposed facilities would be less visible from viewpoints with high viewer sensitivity or high use volumes, but would remain visible for other viewers. Effects on other resources: None.

GW-VR-4: Site Groundwater Development Structures and Facilities in BLM VRM Class III or IV Areas. No well pads or roads would be constructed in Class I and II areas. Effectiveness: Siting facilities to avoid VRM Class I and II areas would be highly effective in minimizing visual impacts from sensitive viewpoints. VRM Class I and II areas account for 24,000 acres or approximately 3 percent of the potential groundwater development area. Compatibility with VRM objectives would be determined in subsequent NEPA documents. Effects on other resources: None.

Residual impacts include:

- The open, flat, and homogeneous nature of valley floors has a low visual absorption capacity to change. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring and Snake valleys) compared to those with fewer proposed wells (e.g., Cave, Dry Lake, and Delamar

valleys). Well housings, and up to 434 miles of pipelines and 25 kV power lines in each of the five hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. Periodic vehicle and worker activity associated with operations and maintenance would be visible and produce dust on unimproved roads.

- Groundwater development activities in the Spring and Snake valleys would not meet the intent of NPS scenery management objectives.

Groundwater Pumping

Potential Changes in Landscape Appearance from Groundwater Drawdown Effects on Vegetation

The incremental expansion of the Proposed Action groundwater drawdown area over time in relation to the wetland and basin shrubland cover types, potentially affected springs, and potentially affected perennial stream segments is summarized in Section 3.5.4 and **Figure 3.5-4**, Vegetation Resources. There are no criteria regarding the effects of groundwater drawdown on the vegetation communities that characterize the study area to assist in making a determination of impacts that are incompatible with BLM VRM Class II and III objectives. Site-specific effects to vegetation from groundwater drawdown and compliance with management objectives would be addressed through subsequent NEPA analyses.

SNWA ACMs and stipulated agreements for Spring, Cave, Dry Lake, and Delamar valleys propose several broad measures to minimize groundwater pumping effects on vegetation. GW-VEG-3, described in Section 3.5, Vegetation, specifies a Monitoring, Mitigation and Management Plan for Snake Valley that includes monitoring measures for vegetation community composition and distribution. These measures also would reduce effects on visual resources.

Conclusion. Drawdown of groundwater would potentially dry out the soil moisture profile of ET area vegetation (wetland/meadow, basin shrubland), and vegetation dependent on spring flows. Drawdown induced root zone stress may result in broad scale vegetation composition changes at various locations across the landscape. It is expected that the overall pattern and form of native vegetation communities within the landscape would remain similar over time. Because these vegetation composition changes would proceed slowly, it is unlikely that most public viewers (primarily highway travelers and dispersed recreational users) would recognize a change in vegetation community appearance as a distinct contrast relative to the surrounding landscape. On a more site-specific scale, valley residents (ranchers and farmers), and tribal members who visit traditional use areas may recognize changes in vegetation communities over time because of long term familiarity with specific landscape features such as springs, and frequent visits to these types of sites.

Proposed mitigation measures:

None.

Residual impacts include:

- Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected.

3.15.2.10 Alternative A

Groundwater Development Area

Development of the groundwater development areas would result in a permanently changed visual setting in the study area subsequent to, and in addition to, the action alternatives for the proposed ROW facilities. Impacts from construction, operations, and maintenance are dependent on the location and visibility of future facilities in relation to the volume and sensitivity of viewers, and will be addressed through future site-specific impact assessments. Development of up to 117 well sites would affect the overall visual landscape in each of the five hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 3,171 acres of permanent ROW, 1,562 acres of temporary ROW, and up to 82 staging areas. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring and Snake valleys) compared to those with fewer proposed wells (e.g., Cave, Dry Lake,

and Delamar valleys). Up to 246 miles of pipelines and 25-kV power lines in each of the five hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. It is assumed that SNWA would implement its ROW ACMs, including its commitment to locate collector pipelines, distribution power lines, and secondary substations along existing roads or other utility alignments, use VRM compatible paint and materials for aboveground structures, and minimize nighttime lighting. Further, in future site-specific NEPA analyses, SNWA would implement additional mitigation recommendations to 1) avoid locating groundwater production wells on slopes greater than 5 percent; 2) bury distribution power lines in sensitive viewing situations; 3) utilize terrain and distance to screen groundwater development facilities from sensitive viewpoints; and 4) avoid siting facilities in BLM VRM Class I and II areas. Based on these measures, it is expected that groundwater field development construction and facility maintenance would meet VRM Class objectives.

Proposed mitigation measures:

Same as the Proposed Action.

Residual impacts include:

Same as the Proposed Action.

Groundwater Pumping

The effects of drawdown of groundwater under Alternative A would be less than the Proposed Action, but would still potentially dry out the soil moisture profile, creating a drawdown-induced root zone stress that would change the composition of existing vegetation. Pumping would occur in five basins at distributed locations. The potential responses by viewers to gradual changes in vegetation communities are the same as those described for the Proposed Action.

Conclusion. The Proposed Action conclusion would apply to this alternative.

Proposed mitigation measures:

None.

Residual impacts include:

Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected.

3.15.2.11 Alternative B

Groundwater Development Area

Development of the groundwater development areas would result in a permanently changed visual setting around points of diversion in five basins subsequent to, and in addition to, the action alternatives for the proposed ROW facilities. Impacts from construction, operations, and maintenance are dependent on the location and visibility of future facilities in relation to the volume and sensitivity of viewers and will be addressed through future site-specific impact assessments. Development of up to 136 well sites would affect the overall visual landscape in each of the five hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 3,072 acres of permanent ROW, 1,513 acres of temporary ROW, and up to 79 staging areas. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring and Snake valleys) compared to those with fewer proposed wells (e.g., Cave, Dry Lake, and Delamar valleys). Up to 236 miles of pipelines and 25-kV power lines in each of the five hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. It is assumed that SNWA would implement its ROW ACMs, including its commitment to locate collector pipelines, distribution power lines, and secondary substations along existing roads or other utility alignments, use VRM compatible paint and materials for

aboveground structures, and minimize nighttime lighting. Further, in future site-specific NEPA analyses, SNWA would implement additional mitigation recommendations to 1) avoid locating groundwater production wells on slopes greater than 5 percent; 2) bury distribution power lines; 3) utilize terrain and distance to screen groundwater development facilities from sensitive viewpoints; and 4) avoid siting facilities in BLM VRM Class I and II areas. Based on these measures, it is expected that groundwater field development construction and facility maintenance would meet VRM Class objectives.

Proposed mitigation measures:

Same as the Proposed Action.

Residual impacts include:

Same as the Proposed Action.

Groundwater Pumping

The effects of groundwater drawdown on vegetation under Alternative B would be similar to the Proposed Action. The potential responses by viewers to gradual changes in vegetation communities are the same as those described for the Proposed Action.

Conclusion. The Proposed Action conclusion would apply to this alternative.

Proposed mitigation measures:

None.

Residual impacts include:

Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected.

3.15.2.12 Alternative C

Groundwater Development Area

Development of the groundwater development areas would result in a permanently changed visual setting in the study area subsequent to, and in addition to, the action alternatives for the proposed ROW facilities. Impacts from construction, operations and maintenance are dependent on the location and visibility of future facilities in relation to the volume and sensitivity of viewers, and will be addressed through future site-specific impact assessments. Development of up to 117 well sites would affect the overall visual landscape in each of the five hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 3,171 acres of permanent ROW, 1,562 acres of temporary ROW, and up to 82 staging areas. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring and Snake valleys) compared to those with fewer proposed wells (e.g., Cave, Dry Lake, and Delamar valleys). Up to 246 miles of pipelines and 25-kV power lines in each of the five hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape.

Proposed mitigation measures:

Same as the Proposed Action.

Residual impacts include:

Same as the Proposed Action.

Groundwater Pumping

The effects of groundwater drawdown on vegetation under Alternative B would be similar to the Proposed Action. The potential responses by viewers to gradual changes in vegetation communities are the same as those described for the Proposed Action.

Conclusion. The Proposed Action conclusion would apply to this alternative.

Proposed mitigation measures:

None.

Residual impacts include:

Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected

3.15.2.13 Alternative D

Groundwater Development Area

Development of the groundwater development areas would result in similar construction and operation effects as discussed for the Proposed Action, except that impacts would not occur in White Pine County. Impacts from construction, operations, and maintenance are dependent on the location and visibility of future facilities in relation to the characteristic landscape and the volume and sensitivity of viewers and would be addressed through future site-specific impact assessments.

Conclusion. Development of up to 83 well sites would affect the overall visual landscape in each of the four hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 2,637 acres of permanent ROW, 1,299 acres of temporary ROW, and up to 69 staging areas. Up to 206 miles of pipelines and 25-kV power lines in each of the four hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. Evidence of changes in views from GBNP would be avoided in Alternative D.

Proposed mitigation measures:

None.

Residual impacts include:

- The open, flat, and homogeneous nature of valley floors has a low visual absorption capacity to change. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring Valley) compared to those with fewer proposed wells (e.g., Cave, Dry Lake, and Delamar valleys). Well housings, and up to 206 miles of pipelines and 25 kV power lines in each of the four hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. Periodic vehicle and worker activity associated with operations and maintenance would be visible and produce dust on unimproved roads.

Groundwater Pumping

The effects of drawdown of groundwater under Alternative D would be less than the Proposed Action. The potential responses by viewers to gradual changes in vegetation communities on the same as those described for the Proposed Action.

Conclusion. The Proposed Action conclusion would apply to this alternative.

Proposed mitigation measures:

None.

Residual impacts include:

Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected.

3.15.2.14 Alternative E

Groundwater Development Area

Development of the groundwater development areas would result in similar construction and operation types of effects discussed for Alternative D except that impacts would be limited to Cave, Delamar, Dry Lake, and Spring valleys. Impacts from construction, operations, and maintenance are dependent on the location and visibility of future facilities in relation to the volume and sensitivity of viewers, and would be addressed through future site-specific impact assessments.

Conclusion. Development of up to 83 well sites would affect the overall visual landscape in each of the four hydrologic basins. Changes in visual characteristics due to vegetation disturbance, removal and the re-establishment of woody vegetation would persist for more than 5 years over 2,661 acres of permanent ROW, 1,316 acres of temporary ROW, and up to 70 staging areas. Up to 210 miles of pipelines and 25 kV power lines in each of the four hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. Long-term visual impacts would be greatest in Spring Valley as it would contain a higher number of proposed groundwater production wells compared to Cave, Dry Lake, and Delamar valleys.

Proposed mitigation measures:

None.

Residual impacts include:

The open, flat, and homogeneous nature of valley floors has a low visual absorption capacity to change. Long-term visual impacts would be greater in basins with a higher number of proposed groundwater production wells (e.g., Spring Valley) compared to those with fewer proposed wells (e.g., Cave, Dry Lake, and Delamar valleys). Well housings, and up to 210 miles of pipelines and 25 kV power lines in each of the four hydrologic basins would permanently modify visual resources in the study area by creating moderate to strong contrasts in form, line, color, and texture with the existing natural landscape. Periodic vehicle and worker activity associated with operations and maintenance would be visible and produce dust on unimproved roads. No facilities would be located in proximity to GBNP in Snake Valley.

Groundwater Pumping

The effects of drawdown of groundwater under Alternative E would be less than the Proposed Action. The potential responses views to gradual changes in vegetation communities are the same as those described for the Proposed Action.

Conclusion. The Proposed Action conclusion would apply to this alternative.

Proposed mitigation measures:

None.

Residual impacts include:

Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize these changes would vary by the relative experience of the viewer with the landscapes affected.

3.15.2.15 No Action

Groundwater Development Area

Under the No Action Alternative, the proposed groundwater field development construction and facility maintenance would not occur, would not contribute to visual changes, and would not contribute to visual resource cumulative effects in the analysis area. Groundwater field development by existing and approved projects would continue.

Groundwater Pumping

Based on the hydrologic model analysis for this EIS, groundwater pumping under the No Action Alternative could affect surface water sources in 8 to 19 basins. As indicated by the number of springs or perennial streams located within the 10-foot groundwater drawdown contour, most of the effects could occur in the following valleys: Dry Lake, Lake, Panaca, Lower Meadow Valley, Wash, Patterson, and Clover. Wetland/meadows and basin shrubland shrub vegetation associated with the surface water sources could be altered in terms of composition and density. As a result, gradual and subtle effects on views of the landscape could become evident, as a result of composition changes in these vegetation communities.

3.15.2.16 Alternatives Comparison

Comparisons of visual resource impacts for groundwater development and pumping are shown in **Table 3.15-12**.

Table 3.15-12 Comparison of Visual Resource Impacts for Groundwater Development and Pumping, Proposed Action and Alternatives A through E

Parameter	Proposed Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Groundwater Field Construction and Facility Maintenance						
Basins Affected by Aboveground Facilities	5	5	5	5	4	4
Groundwater Development Areas in VRM Class I (acres)	402	402	1,272	402	402	402
Groundwater Development Areas in VRM Class II (acres)	23,412	23,412	2,213	23,412	12,822	22,938
Groundwater Development Meets Intent of GBNP Visual Objectives	No	No	No	No	Yes	No
Groundwater Production Wells	Up to 174	Up to 117	Up to 136	Up to 117	Up to 83	Up to 83
Collector Pipelines and Electric Power Lines (miles)	Up to 434	Up to 246	Up to 236	Up to 246	Up to 206	Up to 210
Total Surface Disturbance from Permanent and Temporary ROW (acres)	Up to 8,265	Up to 4,732	Up to 4,585	Up to 4,732	Up to 3,936	Up to 3,977

3.15.3 Cumulative Impacts

Issues

Rights-of-way and Facility Maintenance

- Long-term, cumulative visual resource changes resulting from aboveground facilities, power lines, project surface disturbance, construction-generated dust, and potential light sources due to past, present, and RFFAs as seen from public viewpoints on roadways, residential areas, and public lands visited by tourists and recreational users (e.g., GBNP, Humboldt-Toiyabe National Forest, NWRs, scenic byways, and other formal and informal recreational areas).
- Compliance of cumulative effects from past, present, and RFFAs on public lands with visual resource objectives.
- Groundwater Pumping Effects.
- Changes in vegetation appearance of hydrologic basins as the result of groundwater drawdown from past, present, and reasonably foreseeable actions.

Assumptions

Rights-of-way and Facility Maintenance

- Study Area. The study area includes the affected valleys or hydrologic basin boundaries which naturally define viewshed boundaries from low elevations as shown on **Figure 3.3.1-1**. When viewed from higher elevations, the study area extends 15 miles from the proposed ROWs and groundwater development areas. This corresponds to the BLM background distance zone for visual resource analysis.
- The past and present actions and RFFA footprints are based on utility ROWs and other surface disturbance activities identified in BLM and other databases (see Chapter 2, **Table 2.9-1** and Section 2.9, Description of the Proposed Action and Alternatives). No cumulative effects to visual resources related to surface development activities are anticipated outside the basins affected by ROW and groundwater development activities.
- Time frames. Surface disturbance effects range from full build out of the ROW facilities (approximately 2022) to full build out plus 75 years, which is the estimated time for some vegetation species to recover to their former density and size.

Groundwater Pumping Effects

- The groundwater pumping effects study area is the regional model boundary, as shown on **Figure 3.0-1**.
- Time frames. Time frames for groundwater pumping effects range from full build out of the entire project (approximately 2050) to full build out plus 75 years, which is the estimated time for some vegetation species to recover to their former density and size.

Methodology for Analysis

Rights-of-way and Facility Maintenance

- The cumulative effect of aboveground facilities to the scenic quality and landscape character of the study area were estimated by identifying aboveground facilities for past and present actions and FFAs, and the development areas for the project alternative within each basin viewshed. Because the Basin and Range physiographic pattern of broad, low desert plains bounded by high mountain ridges provides for wide and distant vistas (see Section 3.15.1.2), it is reasonable that cumulative effects would occur within the same viewshed.
- Cumulative impacts to visual resources would occur where project facilities, past and present actions, and RFFAs change high scenic quality areas (as represented by VRI Class I and II, and VRM Class I and II areas) or occupy the same field of view as past and present actions and RFFAs, so that changes in the visible landscape character are perceived. For example, cumulative impacts would occur if a viewer perceives that the scenic quality or landscape character of a viewshed (i.e., Spring Valley) or multiple basins (study area as seen from highways) is diminished by the proliferation of aboveground structures or construction effects, even if the changes are not within the same field of view as existing or future structures. The result is a perceived “cultural modification” of the existing landscape character.

Groundwater Pumping Effects

- Cumulative visual effects were qualitatively estimated from Section 3.5, Vegetation, cumulative based on the potential changes to Wetland/Meadow and Basin Shrubland, springs, and perennial stream reaches.

3.15.3.1 No Action

Under No Action, the proposed groundwater development facilities would not be constructed. However, the cumulative effects of past and present actions, as well as the reasonably foreseeable actions may occur as discussed in the next Section, 3.15.3.2, Proposed Action.

3.15.3.2 Proposed Action

Rights-of-way and Facility Maintenance

Cumulative Visual Resource Changes from Aboveground Facilities and Surface Disturbance

- Historically, past and present activities, aboveground development, and surface disturbance have resulted in transportation and utility corridors, rural communities, mining districts, wildfires, ranching and agriculture facilities, and recreational use areas. Highways, local roads and distribution-voltage power lines occur in nearly every basin. Industrial uses and high-voltage power lines occur in Apex, north of Las Vegas. Major urban developments occur throughout the Las Vegas Valley. North of Las Vegas, commercial and residential areas are concentrated around the rural communities of Ely, McGill, Baker, Garrison, Pioche, and Panaca. Few high-voltage power lines above 138 kV exist, although multiple linear utility ROWs for high-voltage power lines and pipelines have been authorized by BLM and are considered as past and present actions and construction has not commenced. While there are no steel power lines in the study area from Apex to Ely, construction began in 2010 on the 236-mile 500 kV ON Line project which will be comprised of 100 to 185 feet tall single-circuit steel H-frame and lattice towers (BLM 2010). However, between the developed areas of Apex to Ely the overall level of development is low; most of the study area is characterized as a primarily natural-appearing Great Basin ranch landscape with historical, cultural and recreational points of interest.
- RFFA surface disturbance areas are shown by hydrologic basin in **Table 2.9-1** and **Figures 2.9-1** and **2.9-2** illustrate RFFA locations. RFFA aboveground facilities that fall within the same hydrologic basins as project alternatives have the most potential to create foreseeable future changes to the scenic quality and landscape character of the study area.

Cumulative Effects. Visual resource cumulative effects would result from the Proposed Action, the past and present actions, and RFFAs including a new utility corridor and associated facility developments that would generally parallel the proposed project in the SWIP and LCCRDA corridors. Because the majority of the project is located in a designated utility corridor, it is probable that additional development would occur in the corridor if the proposed project is not developed. The visual impact of each reasonably foreseeable type of activity (e.g., wind, high-voltage power lines, roads, water development) is dependent on its siting, facility design, lighting, compliance with VRM best practices, and relationship to sensitive viewing areas. Similar to the Proposed Action, all of the wind, high-voltage power lines, and water development project types require vegetation removal and site grading, access roads, staging areas, underground or overhead collection and communication lines, and operation and maintenance facilities, resulting in increased human presence, increased vehicle traffic, and construction-generated dust similar to but at varying scales and extents than the construction and facility maintenance impacts described for the Proposed Action. The potential construction schedules for one or more of these projects could overlap the construction period for the Proposed Action, resulting in the potential for multiple construction activities visible within the same viewshed.

Wind generation projects generally include 3 or more commercial wind turbine generators that are typically over 300 feet tall sited in dispersed array patterns across high and low elevation areas. Due to their color, height, placement on the landscape, night lighting, and motion, wind generation projects generally dominate attention within 4 miles, and individual wind turbine generators can be seen by the human eye at distances up to 30 miles. The Spring Valley Wind Energy Facility shown in **Figure 3.15-8** consists of 66 wind generation turbines with a total height of approximately 130 meters (426 feet) and has been approved by BLM in Spring Valley but is currently under litigation (BLM 2010).

Figure 3.15-8 Photographic simulation of the Spring Valley Wind Energy Facility as seen from Wheeler Peak (BLM 2010)

The present LCCRDA utility corridor that extends from southern Dry Lake Valley to the vicinity of Apex is currently occupied by one electrical high-voltage power line and will be occupied by the ON Line transmission line under construction. The ON Line Transmission project shown in **Figure 3.15-9** consists of 100 to 185 feet tall single-circuit steel H-frame and lattice towers. The major additive cumulative effects would be the expansion in the width of adjacent utility ROWS, which would increase the number, scale, and magnitude of high-voltage power lines. Where project alternative power lines parallel existing and future transmission corridors, fewer visual contrasts would result than locations where power lines do not share a similar corridor.

Figure 3.15-9 Photographic simulation of the ON Line Transmission Project, which would be comparable to additional high-voltage power lines that could be located in existing utility corridors (BLM 2010)

Roads and water development actions would result in visual impacts similar to the Proposed Action, with long-term impacts to visual resources consisting of moderate form, line, color, and texture contrasts of the revegetated pipeline ROW and aboveground power lines with the existing predominantly natural setting. New access roads, authorized and unauthorized OHV recreational trails, and highway improvements would create an extensive network of roads that when viewed together would result in a fragmented landscape appearance that would be highly visible from high elevations.

Projects that directly intersect or parallel the Proposed Action ROWs or that fall within the foreground or middleground viewshed of the Proposed Action have the most potential to create foreseeable future surface-disturbance and aboveground actions with potential cumulative impacts (see **Figures 2.9-1** and **2.9-2**). Intersections occur at existing road and highway crossings in all affected hydrologic basins; the LCCRDA utility corridor that extends from Lake Valley to the vicinity of Apex; throughout the Apex industrial area; and power line and access roads for future wind energy projects in Snake, Spring, Lake, Dry Lake, and Delamar Valleys.

When within the same viewshed (i.e., basin), the Proposed Action, past and present actions, and RFFAS would contribute to cumulative visual resource impacts by permanently altering the scenic quality and landscape character over large areas of the affected hydrologic basins, converting the ranching and recreational landscape character to a more infrastructure, energy, and industrial based landscape character. Substantial future wind, and high-voltage power line aboveground structures, and surface disturbance development from roads, water development, and/or other uses would occur in the 13 basins. All basins are estimated to have between 1 and 3 different future project types (power lines, roads, water development, etc). When combined with past and present actions and RRFAs, the Proposed Action ROWs and groundwater developments would equate to less than 1 percent of all future surface disturbance in the basins. Future aboveground facilities would be visible over a much larger area within each basin, potentially affecting most of the viewshed despite the actual acres that would be directly impact by the construction and operation of cumulative projects.

Viewpoints with high viewer sensitivity or high use volumes would see the cumulative changes throughout the study area. Short-term and long-term visual resource changes would be obvious from public viewpoints visited by tourists and recreational users (e.g., GBNP, Humboldt-Toiyabe National Forest, NWRs, scenic byways, and other formal and informal recreational areas as shown in **Figure 3.9-1**). Sensitive viewpoints are located in every affected valley in the study area, as well as in many high elevations that provide broad, overlooking views of the affected valleys. The greatest number of potential viewers would be traveling on scenic byways U.S. 93 and U.S. 50/6/93, which is the primary north-south route through the study area.

The type, scale, and number of Proposed Action and cumulative actions would result in large portions of the following viewsheds and sensitive viewing areas impacted:

- Dry Lake , Delamar, Coyote Spring Valleys – strong contrasts and cumulative effects resulting from the Proposed Action ROW and groundwater development areas, combined with existing utility ROWs, the ON Line transmission project, Eastern Nevada transmission line, other high voltage power lines, roads, and water development. These projects would be visible from the Silver State Trail Backcountry Byway, and Highway 93.
- Lake Valley – strong contrasts and cumulative effects resulting from the Proposed Action ROWs, combined with the Wilson Creek Wind Project, high voltage power lines, roads, water development, and other RFFAs. These projects would be visible from scenic byway U.S. 93 and the Silver State Trail Backcountry Byway.
- Spring Valley – strong contrasts and cumulative effects resulting from the Proposed Action ROWs and groundwater developments, combined with existing high voltage power lines, the Spring Valley Wind Energy project, roads, water development, and fiber optic lines. These projects would be visible from scenic byway U.S. 50/6/93, the Loneliest Highway Special Recreation Management Area, developed recreation and bird watching sites, Humboldt-Toiyabe National Forest, and high elevations of GBNP.
- Snake Valley – the GWD Project would not interact cumulatively with foreseeable projects in Snake Valley. The Project facilities would be located in open rangeland. Some of the rangeland near Baker has been converted to grassland to improve forage production. The GWD Project facilities would be located within this intermixture of natural and modified landscapes. The visual resource effects of project facilities as viewed from GBNP are discussed by individual project alternative.

- Steptoe Valley – strong contrasts and cumulative effects resulting from the Proposed Action power line combined with roads, water, fiber optic, power lines, and other RFFAs in the Ely vicinity, along scenic byway U.S. 50/6/93, from designated fishing and bird watching areas, and the Loneliest Highway and Egan Crests Special Recreation Management Areas.

Conclusion. Cumulative effects to visual resources would occur from aboveground facilities and surface disturbance, which include large scale facilities such as high-voltage power lines, wind energy projects, as well as ancillary facilities such as substations and roads within the viewsheds of the Proposed Action. The Proposed Action's contribution to the development within the desert landscape would contribute cumulative visual impacts when considered with existing and future foreseeable projects within the immediate viewsheds of Spring Valley, Dry Lake Valley, Lake Valley, Coyote Spring Valley, Delamar Valley, and Steptoe Valley.

Cumulative Effects Compliance with Visual Resource Objectives

A small number of linear ROWs cumulative actions would affect USFS management objectives. USFS visual quality objectives apply only to USFS-managed lands which primarily are located on the region's mountain ranges, and would not be affected by the majority of cumulative actions.

Cumulative projects, as seen from highways approaching the park and from high elevations within the GBNP, would not meet the intent of NPS scenery management objectives.

Most of the Proposed Action and cumulative projects are located on BLM lands managed for VRM IV objectives, which accommodates major visual changes. The Proposed Action's contribution to the development of the desert landscape would potentially conflict with BLM VRM Classes II and III when considered with existing and future foreseeable projects within the immediate viewsheds of Delamar Valley, Dry Lake Valley, Lake Valley, Spring Valley, and Steptoe Valleys as follows:

- Dry Lake Valley – the Proposed Action when combined with existing and future wind, groundwater development, linear ROWs crossing VRM Class II and III would dominate attention.
- Lake Valley – the Proposed Action when combined with existing and future wind, power, and linear ROWs crossing VRM Class II and III would attract attention.
- Spring Valley – the Proposed Action when combined with existing and future wind, power, and linear ROWs crossing VRM Class II and III would dominate attention.
- Steptoe Valley – the Proposed Action when combined with existing and future linear ROWs crossing VRM Class II and III in the vicinity of Ely would attract attention.

Conclusion. The Proposed Action when considered with existing and future foreseeable projects would meet USFS and GBNP visual quality objectives for land administered by USFS and NPS, but would not meet the intent of GBNP viewshed preservation objectives outside of NPS boundaries.

The majority of cumulative projects cross BLM lands managed for VRM Class IV. Individual past and present actions and RFFP activities may be consistent with VRM II, III, and IV objectives, depending on the distance from which facilities would be viewed and the VRM Class in which they are located. However, the type, number, magnitude, and geographic extent of cumulative projects located in relatively close proximity to each other within the same basin could potentially attract or dominate attention, increasing the potential that Class II and III objectives would not be met in many of the affected valleys. Wind energy projects in particular have the potential to be highly visible from distances of more than 30 miles, depending on the size of the turbines and other factors such as atmospheric conditions and intervening terrain. The Proposed Action's contribution to the development of the desert landscape would potentially conflict with BLM VRM Classes II and III when considered with existing and future foreseeable projects within the immediate viewsheds of Dry Lake Valley, Lake Valley, Spring Valley, and Steptoe Valleys. In addition, cumulative development in the designated utility corridor would also potentially conflict with established VRM classes. As a result, future VRIs and RMP VRM Class decisions may downgrade, or change VRM Class II and III lands to VRM Class IV.

Groundwater Pumping Effects

Gradual and subtle visual changes to ET areas and wetlands below springs may result from long term cumulative groundwater pumping. See the discussion of cumulative effects to vegetation, and the relative contribution of the GWD Project alternatives to the total cumulative effects in Section 3.5.

Table 3.15-13 summarizes the impacts from groundwater development area construction, operations, and maintenance for Alternatives A through E as compared to the Proposed Action.

Table 3.15-13 Summary of Cumulative Visual Impacts for Alternative A through E, Groundwater Development Areas

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Development				
Effects would be similar to the Proposed Action, although reduced in extent as groundwater development areas are reduced in Alternative A.	Cumulative effects to visual resources would occur in all basins from Alternative B similar to Alternative A.	Cumulative effects to visual resources would occur in all basins from Alternative C similar to Alternative A.	Cumulative effects to visual resources would occur in all basins from Alternative D similar to Alternative A, except in Spring Valley north of the White Pine County line and Snake Valley where no impacts would occur.	Cumulative effects to visual resources would occur in all basins from Alternative E similar to Alternative A, except in Snake Valley where no impacts would occur.
Pumping				
Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize this change would vary by the relative experience of the viewer with the landscapes affected. See Section 3.5 Vegetation for the potential trends in vegetation composition and structure in response to groundwater pumping.	Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize this change would vary by the relative experience of the viewer with the landscapes affected. See Section 3.5 Vegetation for the potential trends in vegetation composition and structure in response to groundwater pumping.	Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize this change would vary by the relative experience of the viewer with the landscapes affected. See Section 3.5 Vegetation for the potential trends in vegetation composition and structure in response to groundwater pumping.	Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize this change would vary by the relative experience of the viewer with the landscapes affected. See Section 3.5 Vegetation for the potential trends in vegetation composition and structure in response to groundwater pumping.	Gradual and subtle changes in vegetation community composition and appearance may occur over long periods of time. The ability to recognize this change would vary by the relative experience of the viewer with the landscapes affected. See Section 3.5 Vegetation for the potential trends in vegetation composition and structure in response to groundwater pumping.