2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action (Section 2.1), Alternative 1 (Section 2.2), and the No Action Alternative (Section 2.3). Several other alternatives were considered, but were eliminated from detailed analysis (Section 2.4). Details regarding project facilities and design, construction, operation, and maintenance activities were provided to the BLM as part of the Applicant's Plan of Development (POD). The LCWD's POD includes project design and construction techniques specific to the groundwater development aspects of the Proposed Action. The LCPD and Southwest Gas have provided separate PODs to the BLM in support of the Proposed Action. The groundwater and electrical utilities, natural gas pipeline and metering station, and the fiber optic lines may proceed in a parallel but independent manner with regards to permitting, construction, and operation.

Pursuant to the CEQ regulation section 1502.14, this Draft EIS presents reasonable alternatives within and outside the BLM's jurisdiction. Actions connected to the Proposed Action but outside the BLM jurisdiction include the location of groundwater diversions and amount of groundwater permitted by the NSE; and the groundwater monitoring and management agreements among the Applicant, NPS, and the NSE. Although the BLM is not a party to these agreements, the BLM has worked, and will continue to work, closely with these agencies to ensure the Proposed Action is compatible with the regulatory requirements and jurisdictional responsibilities of each agency.

2.1 PROPOSED ACTION

The LCWD is proposing to construct and operate the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project (Proposed Action). The project is located in southeastern Lincoln County, Nevada. The project alignment would be oriented north to south; between the Clover Mountains in the northern reach and the Mormon Mountains to the west, and terminating in the LCLA development area at the southern terminus (**Map 1-1**). The Proposed Action includes groundwater facilities, electrical power infrastructure, communication facilities, and a natural gas pipeline.

The BLM's approval of the ROW(s) would allow the LCWD to construct infrastructure required to pump and convey groundwater resources in the Clover Valley and Tule Desert Hydrographic Areas to help meet current and future municipal water needs in newly urbanizing areas in southeastern Lincoln County; specifically, the LCLA development area, north of Mesquite. The general locations of project components (which are common for both the Proposed Action and Alternative 1) are illustrated on **Map 2-1** and summarized below.

Water Facilities

- Water Pipelines: Approximately 75 miles of collection and transmission pipeline (main water line) and included well field collection pipelines for up to 30 wells (main collection plus laterals to wells) are proposed. Pipeline sizes range from 30 inches in diameter in the northern portions to 54 inches in diameter in the southern sections. Well fields include:
  - Clover Valley - up to 15 groundwater production wells and lateral pipelines.
  - Tule Desert - up to 15 groundwater production wells and lateral pipelines.

- Storage Tanks (up to five storage tanks):
  - Two (2) – 100,000-gallon storage tanks in the Clover Valley well field area
  - One (1) – 300,000-gallon storage tank in the Tule Desert well field area
  - One (1) – 500,000-gallon storage tank near the proposed Toquop Energy Project
  - One (1) – 4,000,000-gallon storage tank in the LCLA development area
- Seventeen production or monitoring wells are currently used to monitor groundwater levels in the Tule Desert Hydrographic Area. Additional monitoring wells may be constructed per terms and conditions associated with future water rights or Stipulation Agreements between the NPS and the LCWD.
- Water pipeline booster stations (up to four): each booster station would include an above ground-set forebay storage tank with a capacity of up to 200,000 gallons and aboveground piping and pumping equipment contained within a booster station building.
- Radio Telemetry or Fiber Optic Cable Control Systems (to be buried with the groundwater pipelines) would be used to monitor groundwater operating system information in addition to routine checks by maintenance personnel.

Electric Utility Facilities

- A new 138 kilovolt (kV) double-circuit overhead transmission line (approximately 23.5 miles long) between the existing Mesa Substation north of Mesquite and the proposed Tule Substation.
- A new substation in the Tule Desert (Tule Substation).
- A new 22.8 kV double-circuit overhead distribution line (approximately 20 miles long) between the proposed Tule Substation to groundwater facilities in the Clover Valley.
- New 22.8 kV and 4.16 volt overhead distribution lines to provide electric service to wells within the Tule Desert and Clover Valley Hydrographic Areas.
- New 22.8 kV-4,160/480 V substations at each well site, booster station, and flow control station.

Natural Gas Facilities

- Up to a 16-inch natural gas pipeline between the existing Kern River Natural Gas pipeline near the proposed Toquop Energy Project and the LCLA development area.
- A new natural gas metering station (tie-in to the existing Kern River Natural Gas pipeline at a location immediately east of the proposed Toqoup power plant).

Buried Fiber Optic Lines

- The LCT intends to route fiber optic lines in the same trench as the water pipeline. Installation procedures and locations will be developed during the final project design.

Ancillary Project Components

- Extra Work Space: Up to 50 acres (temporary); typical dimensions of 60 by 200 feet, and 150 feet by 150 feet, located approximately every mile along the pipeline ROW. Some larger 1- to 2-acre extra work space areas may be designated to facilitate material storage or temporary offices.
- Construction Staging Areas: Up to 100 acres (temporary); assumes up to 20 five-acre sites.
- Temporary and permanent access roads.

Project construction is estimated to require between 18 and 24 months, and would begin upon completion of the NEPA process and acquisition of all necessary permits and approvals. The groundwater production facilities, groundwater collection and transmission pipelines, electric transmission and distribution system, and fiber optic line would be constructed during the same construction timeframe. Southwest Gas' present project schedule indicates that construction of the natural gas pipeline would occur during early 2009. Construction of the natural gas pipeline and metering station is expected to take 4 to 6 months.

Between the proposed Toquop Energy Project site and a point northeast of the Toquop Wash in Section 30, T11S, R70E, approximately 1.5 miles east of the Toquop plant site, all facilities would be located within an existing 2,640-foot wide utility corridor. Existing utility facilities within this designated corridor are: two Kern River natural gas pipelines; three electric transmission lines; the 500 kVAC (Navajo/McCullough) powerline, the 500 kVDC (IPP) powerline, and the Nevada Power Company 345 kVAC (Harry Allen/Red Butte) powerline; and a buried 0.83-inch diameter fiber optic communication cable. Another existing designated utility corridor is located approximately 3.5 miles north of the LCLA development area just east of the 2,640-foot wide corridor. This additional utility corridor is 1,000 feet wide and contains the 500 kVAC (Navajo/McCullough) electric transmission line and buried fiber optic communication cable stated above.

Where possible, the water and electric facilities would be installed adjacent to existing roads, near the edge of the roadway, and beyond the roadway drainage area. Where the ROW parallels existing roads, the construction easement would be up to 160 feet wide with industry setbacks between utilities (**Figure 2-1**). In areas of cross-country construction, the construction and permanent easement would be up to 160 feet wide allowing setback buffers between utilities (**Figure 2-2**). Additional temporary work areas may be required in areas of rough or steep terrain, wash crossings, and any areas identified as containing sensitive environmental resources. Typical utility spacing between project components north of the Tule Desert, near the proposed Toquop Energy Project, and along the existing utility corridor east of the proposed Toquop Energy Project, are shown in **Figure 2-3** and **Figure 2-4**.

The natural gas line would parallel the groundwater and electrical utility facilities between the existing Kern River Natural Gas Pipeline, located east of the proposed Toquop Energy Project, to the LCLA development area. The easement would be utilized by both Kern River Pipeline and Southwest Gas employees and equipment. The planned tap site and metering station will be fenced.

Table 2-1 lists estimated temporary and permanent disturbance acreage required for construction and operation of the Proposed Action. The estimated disturbance acreage is based on preliminary engineering plans, and does not account for areas of overlap among utilities. The disturbance acreage is likely to be reduced based on refinement of the project layout and design; however, all construction and operations activities would occur within the permitted ROW. The fiber optic lines would be installed within the surface disturbance area for groundwater extraction, transport, and storage. Final ground disturbance would be recalculated by the BLM when final design is complete and the exact locations of structures and roads are known. For purposes of NEPA analysis and disclosure of possible environmental impacts, the acreages included in Table 2-1 are considered the maximum required to construct and operate the Proposed Action.

Table 2-1 Estimated Surface Disturbance by Utility Type

	Temporary (acres)*	Permanent (acres)*
Groundwater Extraction, Transport, and Storage (including telecommunications)	1,417	33
Electrical Distribution Service Facilities	306	186
Natural Gas Distribution Facilities	155	21
Total	1,878	240

* Temporarily disturbed areas are those that would be reclaimed and revegetated following construction. Permanently disturbed areas are those that would be impacted for the life of the project by a facility footprint (e.g., well house, substation access road).

2.1.1 Facility Components and Design

The following section describes facility components and design for each of the various utilities. Coordination is ongoing among the utilities regarding common construction, maintenance access roads, and sharing of ROW.

2.1.1.1 Well Field Collection System / Pipelines

Approximately 75 miles of water collection and transmission pipeline would be constructed under the Proposed Action (as shown on **Map 2-1**). Pipeline sizes will range from 30 inches in the northern portions to 54 inches in the southern portion of the project area. The well field collection system includes two well field pipeline collection systems in the Clover Valley and one in the Tule Desert Valley. The Clover Valley collection branches would convey water from the western and eastern sections of the southern third of the Clover Valley and converge near the southern end of the valley, connecting the well fields to a central storage tank (ST-5), at which point the main transmission pipeline would begin.

The Tule Desert collection system includes individual production wells connected to a central storage tank (ST-3) via lateral pipelines connecting with the main transmission line. The collection pipeline continues from the Tule storage tank to the confluence with the main transmission line. The main water transmission pipeline would convey water from the confluence of the Clover Valley collection pipeline branches to the terminal storage tank on the LCLA development property.

The number of wells to be installed and the production capabilities of each well field would be

based on final engineering designs developed subsequent to the determination of water rights. In order to bound the impact analysis, it is assumed that up to 30 production wells (15 wells in the Clover Valley and 15 wells in the Tule Desert) and associated lateral pipelines connecting the production wells with the well field storage tanks or collection pipelines would be installed.

To protect the wellheads from vandalism and weather, and to minimize maintenance, wellheads in the Clover Mountain area would be enclosed in a masonry block structure meeting current Uniform Building Code construction standards and Lincoln County design requirements. A typical production well house building is shown in **Figure 2-5**.

Each structure would contain all aboveground piping, shutoff valve, check valve, flow meter, air release valve, electrical equipment, and telemetry. The footprint for each pump station building would be approximately 19 feet by 26 feet. An 8-foot high chain link fence would surround the well yard. The structure would be constructed on a foundation elevated slightly above the surrounding grade to help minimize the potential for facility flooding. Electric power would be provided to each well via a proposed overhead 22.8 kV distribution line. A pad-mounted transformer would be located adjacent to the well to step down the voltage from the distribution lines to 480 volts. A typical production well facility site plan is shown in **Figure 2-6**.

A 12.5 percent concentrated sodium hypochlorite (bleach) solution would be used to disinfect groundwater within the transmission pipeline. The solution would be stored in a 2,500-gallon, aboveground, high-density polyethylene tank located within the wellhead building. Secondary containment and related facilities would be provided in accordance with applicable Lincoln County Building Department and Uniform Fire Code regulations. Periodic chemical deliveries would be required approximately once every 3 weeks.

Pipelines would be constructed of steel or iron pipe with a mortar, cement, or bituminous coating, depending on the corrosivity potential of the adjacent soils. The pipeline would be buried 3 to 4 feet below existing grade, or three times scour depth in washes, depending on pipeline diameter and engineering requirements. Alternatively, topographic or geologic conditions may require the pipeline to be suspended over certain crossings (e.g., Toquop Wash) or near-surface hard rock features. If exposed, the pipeline would be painted with a coating designed to withstand local climatic conditions and of a color in harmony with the surrounding environment. The pipeline would be contained within the BLM-granted ROW and would be located within the 2,640-foot wide LCCRDA utility corridor where possible.

Appurtenant facilities to the pipeline would include booster stations, isolation valves, control valves, access manways, air release/vacuum valves and vaults, blow-off valves, fiber optic splice vaults, cathodic protection facilities, and pipe alignment markers. Most appurtenant facilities would be located below existing grades in traffic-rated, lockable concrete vaults. These vaults would typically be located outside of traffic areas and may require small location markers extending above the surface several feet.

Manhole access would be provided every 2,500 feet for 30-inch through 48-inch-diameter pipelines and every 2,000 feet for pipeline with diameters in excess of 48 inches. The locations of these facilities would be based on existing topography and will be determined during final design. Project appurtenances would occur on average every mile along the alignment, and

maintenance access would be coordinated with existing roads. A fiber optic/telemetry system to monitor groundwater facilities would be located in the pipeline trench.

2.1.1.2 Monitoring Wells

Since late 2001, the LCWD has been collecting groundwater level information from monitoring wells in the Tule Desert. Current monitoring wells are listed in **Table 3-7**. All wells include pressure transducers and data loggers. The data collected from these wells are described in detail in Section 3.3 - Water Resources.

2.1.1.3 Booster Stations / Flow Control Stations

Preliminary pipeline designs accommodate more than 4,000 vertical feet of elevation change along the proposed pipeline route. Water would be pumped from the Clover Valley to the summit of East Pass, an approximate vertical gain of 1,000 feet. From the East Pass Summit to the terminal storage tank, the total elevation loss is approximately 4,000 vertical feet. In this section, pipeline diameters would vary from 30 inches near East Pass to 54 inches at the terminal storage tank. **Figure 2-7** depicts the elevation gains/losses within the ROW alignment. The length and diameter of each pipeline segment would be based on established flow rates and locations of each well.

Up to four booster stations would be required to maintain flow pressure throughout the groundwater collection and transmission pipelines from the production wells to the terminal storage tank. Three of the booster stations would be located in the Clover Valley (CBS-1, CBS-2, and CBS-3) and one on the Toquop Energy site (TBS-1). Each booster station would include an above ground-set forebay storage tank with capacities of up to 200,000 gallons. The final flow control design has not been selected. At this time, two options are under consideration. Design Option A would consist of nine 12-inch-diameter open vents to control pipeline pressures. These vents would extend approximately 6 feet above the existing grade at each site and would be placed in a concrete collar and fitted with a heavy-duty screen to prevent entry of foreign objects. Construction of Design Option A would require a temporary disturbance of approximately 0.83 acre and a permanent footprint of 0.76 acre.

Design Option B would consist of up to nine flow-control stations using hydro-turbines along with pressure relief equipment and piping. A standpipe with emergency overflow would be located on the site and would be designed to direct overflow to a rip-rap energy dissipater with discharge to an approved channel or drainage. A 72-inch-diameter standpipe would be located outside of the flow control building and would provide backpressure on the hydro-turbines. Final site plans for each flow control facility would be designed to incorporate existing site conditions to minimize the disturbance area required for construction and operation.

Electric power would be provided to the booster and flow control stations via a proposed overhead 22.8 kV distribution line. A pad-mounted transformer would be located outside each booster and flow control station to step down the voltage from the distribution lines to 480 volts. Each station would be designed to connect with a trailer-mounted standby generator as a backup power source. Radio telemetry or fiber optic cable control systems, in addition to routine checks by maintenance personnel, would be used to monitor operating system information.

To protect the booster and flow control stations from vandalism and weather, and to minimize maintenance, the booster and flow control stations would be enclosed in a masonry block structure that meets current Uniform Building Code construction standards and Lincoln County design requirements. A typical booster station building layout is shown on **Figure 2-8**. A typical flow control station is shown on **Figure 2-9**. The structures would be constructed on a foundation elevated slightly above the surrounding grade to help minimize the potential for facility flooding. An 8-foot high chain link fence would enclose each building. Construction of each booster station would require a temporary disturbance of approximately 3.4 acres and a permanent footprint of 2.1 acres.

Aboveground piping and pumping equipment would be contained in the pump room of the booster station building. A typical booster station plan view layout is illustrated in **Figure 2-10**. The pumps would use automatic control valves and would include redundant pumps to ensure uninterrupted service. The type of pumps and surge suppression systems would be selected during final engineering design.

2.1.1.4 Storage Tanks

Five aboveground water storage tanks are proposed to achieve sufficient storage for uninterrupted pipeline operation and peak water demands. The Clover Valley collection pipeline would convey water from the Clover Valley production wells to the Clover Valley storage tank (ST-5) with an approximate capacity of 100,000 gallons. This storage tank would be placed in a central location within the Clover Valley well field. Another storage tank at East Pass (ST-4) would normalize flow pressures in the pipeline and provide storage for secondary lifting to move water into the Tule Desert Basin.

The Tule Basin storage tank (ST-3) would have a capacity of 300,000 gallons and would be constructed in a centralized location within the Tule Desert production well field. The water level in the well field storage tank would control the operation of the pump station and wells via telemetry. When needed, the wells would pump to the storage tank prior to entering the collection pipelines. Wireless telemetry or buried fiber optic telemetry cable, to be installed by LCT, would be located in pipeline trenches and would enable communication among the collection wells and the well field storage tanks.

Two larger storage tanks would be constructed near the southern end of the project area to provide adequate storage for peak demands. A 500,000-gallon storage tank is proposed near the proposed Toquop Energy Project and would provide 3 to 5 hours of storage. The terminal storage tank would be a 4,000,000-gallon tank located in the LCLA development area that would provide 2 to 5 hours of storage. Additional storage capacity may be provided internally within the LCLA private lands by the developers to ensure that peak hourly delivery rates and duration of service are adequate to meet increasing water use demands.

All storage tanks would be either welded steel, bolted steel, or concrete and constructed aboveground to a maximum height of 40 feet. The tanks would include an emergency overflow drain that conveys excess water into an approved channel or drainage. Water level sensors mounted on the roof of each tank and either radio telemetry or fiber optic communication system would be used to monitor operational information. All storage tanks would be painted a neutral color approved by BLM to blend with the natural surroundings.

Temporary disturbance for each tank site would require up to 2.5 acres per site. Permanent disturbance would vary from 0.25 to 2 acres depending on tank capacity. Each site would be enclosed by an 8-foot high chain link fence. The typical site plan for a water storage tank is shown in **Figure 2-11**. The approximate locations of these storage tanks are shown on **Map 2-1**.

2.1.1.5 Power Distribution

The Proposed Action would include development of overhead electric transmission and distribution lines sized to provide an additional 30 megawatts of power to serve project facilities upon complete build-out. The LCPD currently owns, operates, and maintains electric transmission and distribution facilities within the LCLA development areas. The LCPD is a non-profit local government agency separate from the LCWD. Proposed electric construction and new facilities include the following:

- Construct a new 138 kV overhead transmission line from the existing Mesa Substation to the new Tule Substation.
- Construct the Tule Substation to step down electric service to distribution levels.
- Develop system of 22.8 kV and 4.16 kV overhead distribution lines with step-down transformers at each booster station to service wells in the Tule Desert and Clover Valley well fields.

The overhead electric transmission/distribution lines would generally parallel and overlap the pipeline ROW. However, because overhead lines are able to span topographic gaps that pipeline construction cannot, placement of the electrical lines would be as straight as possible and may deviate from the pipeline ROW at various locations. Each of the new facilities is described in more detail in the following sections.

2.1.1.5.1 138 kV Transmission Line

A new 138 kV overhead transmission line (currently estimated at 23.5 miles long) would be constructed from LCPD's existing Mesa Substation north of Mesquite to the new Tule Substation in the Tule Desert. The 138 kV transmission line would be a double-circuit line constructed on single wood poles approximately 65 feet tall and spaced 250 to 600 feet apart, depending on terrain. The tops of the power poles would be equipped with anti-perching devices to discourage use by raptors and other resident bird species.

The permanent space needed for the 138 kV overhead transmission line would be 100 feet wide. In addition, a 60-foot radius around each angle point on the transmission lines would be required for placement of guy wires.

The span length between structures would range between 300 feet and 700 feet, depending on terrain (seven to nine poles per mile). Shield wire would be installed to protect the transmission line from direct lightning strikes. Small 16-foot wide access spur roads may be needed to access some locations. Access roads would be constructed within the permitted ROW and constructed in accordance with the BLM and county specifications.

2.1.1.5.2 Tule Substation

A new substation would be constructed at the terminus of the 138 kV transmission line near rate of flow control station No. ROFC-4 and would occupy a fenced area of approximately 250 feet by 220 feet with a 100-foot wide drainage buffer on all four sides to allow cut-slopes, drainage berms, and ditches to be constructed external to the substation fence. The substation would transform voltage from 138 kV to 22.8 kV and would allow switching among primary transmission lines. The substation ROW would be enclosed within a 7-foot high chain link fence. Three strands of barbed wire would be placed on top of the chain link fence for additional security. Access to the site would be provided through a 20-foot wide double-swing, lockable gate. Fence signage would be in accordance with National Electric Safety Code requirements.

2.1.1.5.3 Overhead Distribution Lines

A new 22.8 kV double-circuit, single wood pole, overhead distribution line currently estimated at 20 miles long would provide electrical service from the Tule Substation to the groundwater facilities in the Clover Valley. Localized step-down transformers and 4.16 kV distribution lines would provide power to the production wells in both the Tule Desert and Clover Valley. Angle and dead-end structures may be guyed wood poles or galvanized steel structures as determined by site-specific engineering. Pole heights would be approximately 35 feet, spaced 150 to 300 feet apart, depending upon terrain.

The permanent space needed for the 22.8 kV and 4.16 kV overhead distribution lines would be up to 40 feet wide. In addition, a 35-foot radius around each angle point on the distribution lines would be required for placement of guy wires.

Shield wire would be installed to protect the distribution lines from direct lightning strikes. Access roads, up to 16 feet wide, may be needed to access some locations. Access roads would be constructed within the permitted ROW and constructed in accordance with the BLM and county specifications.

2.1.1.5.4 Well Substations

New substations will be constructed to serve the planned LCWD well sites. These substations would be served by the planned 22.8 kV distribution circuits. The well substations would be located on BLM-administered public lands in Tule Desert and Clover Valley. Each substation would be a 100-foot by 80-foot fenced area with a 15-foot grading and drainage buffer. The fenced substation yards would consist of a pad-mounted transformer, primary metering, junction cabinets or switchgear, a capacitor bank, and a station service transformer.

2.1.1.6 Fiber Optic Lines

A fiber optic telemetry cable will be located in a common trench with the water pipeline within the permitted ROW between the LCLA development area and the well fields. Installation procedures and locations would be developed during final project design.

2.1.1.7 Natural Gas Pipeline

Southwest Gas is proposing to construct and operate a 14.3-mile-long buried natural gas pipeline running from the existing Kern River Natural Gas Pipeline at a planned pipeline tap east of the

proposed Toquop Energy Project to the City of Mesquite. Although final design is pending, the 14.3-mile-long natural gas pipeline is proposed to be constructed of steel pipe, and is expected to be at least 8 inches and no greater than 16 inches in diameter. The maximum allowable operating pressure would be 720 pounds per square inch gauge. The upstream point of the proposed pipeline would tie in to the existing Kern River Natural Gas pipeline at a new metering station.

The new tap site and metering station are proposed to be installed adjacent to the existing Kern River Pipeline facilities, utilizing as much of the existing ROW as possible. An additional permanent easement would be used for the new facilities as needed.

2.1.1.8 Extra Work Spaces

Temporary extra work spaces would be located in suitable areas near steeply incised drainages, above and below slopes where construction is expected to be difficult, at pipe laydown areas, and at sites that would be used for equipment parking and storage. Proposed extra work space areas would have typical dimensions of 60 by 200 feet and 150 by 150 feet, and would be located approximately every mile along the pipeline ROW. Some larger 1- to 2-acre extra work space areas may be designated to facilitate material storage or temporary offices.

Prior to construction, the locations of temporary construction offices would be identified in the POD and delineated through consultation with the BLM. Temporary office facilities would likely consist of portable office trailers that would be on site throughout the construction period (up to 24 months). Facilities would be removed from the site and reclaimed upon completion of construction activities.

2.1.1.9 Road Access and Transportation

Primary access to the project area would be via existing public improved roads as well as gravel or dirt-surfaced BLM and county roads. The primary access routes to the project area include county and BLM-maintained dirt roads off of Interstate 15 (I-15) from the south and Highway 93 from the north. As needed, small 16-foot wide access spur roads would be constructed from existing roads to each of the production wells and storage tanks and power poles. All access roads would be constructed in accordance with the BLM and county specifications. At the intersections of paved roads and dirt roads, or improved gravel roads and dirt roads, track-out elimination devices would be installed to limit sediment track-out.

Road maintenance associated with the Proposed Action may include:

- Minor road blading to improve drainage, remove washboards or ruts, and fill holes;
- Minor shoulder improvement to support heavy equipment;
- Corner blading to allow wide-radius turns;
- Temporary gravel fill or culverts at drainage crossings; and
- Temporary gravel road surfacing to prevent rutting during wet weather.

After construction, all temporary construction roads would be removed and restored to their

approximate original contours and dimensions and made to discourage vehicular traffic. All temporary road surfaces would be ripped or harrowed to establish conditions appropriate for reseeding, drainage, and erosion prevention. Permanent access roads would typically be 16 feet wide, graded to prevent slumping or washing, and graveled to provide year-round access.

Some temporary access roads may cross dry washes in the project area. Specific crossing and erosion control measures are provided in the SWPPP prepared for the Proposed Action. Measures to minimize adverse impacts on washes and drainages during construction and operation are described in the Standard Construction and Operation Procedures Checklist provided in **Appendix C.**

2.1.2 Construction Procedures

The LCWD estimates that up to 160 temporary jobs would be created by the Proposed Action. It is anticipated that local workers from Lincoln County and northern Clark County would fill the majority of open construction jobs. Labor trades anticipated to be required during construction include electricians, heavy equipment operators, and other skilled construction laborers. Construction equipment would include light- and heavy-duty trucks, graders, dozers, backhoes, trenchers, manlifts, front-end loaders, water trucks, and water pumps.

Before starting construction, the final project design would be coordinated among the utility agencies and the BLM. Each utility agency would be required to submit a final POD to the BLM for approval prior to the issuance of the BLM Notice to Proceed (Form 2800-15). Each utility agency would be required to comply with the approved POD and any stipulations attached to the ROW.

Each utility agency (e.g., LCWD, LCPD, Southwest Gas, and LCT) would conduct its construction activities within the authorized limits of the permitted ROW and temporary construction sites. Standard construction techniques specific to each industry would be used to construct the project facilities. In addition to standard construction methods, the utility agencies may use special construction techniques where warranted by site-specific conditions (e.g., dryland wash crossings or blasting in areas of solid rock or shallow bedrock). Construction within dryland washes would be conducted in accordance with applicable federal and state regulations. If blasting is required, explosives would be used in accordance with all applicable federal and state permitting requirements and authorizations as well as stipulations of local ordinances.

Each utility agency would assign a designated construction contractor whose responsibilities would include ensuring that construction activities are compliant with all applicable laws and regulations. The contractor(s) would be required at all times to take all reasonable precautions for the safety of project employees and of the public and would comply with all applicable provisions of federal, state, and county safety laws and building and construction codes as well as the safety rules and regulations of their industry. A representative list of laws and regulations that may apply to the Proposed Action is provided in **Table 1-5**. A representative list of permits that may apply to the Proposed Action is provided in **Table 1-6**.

Construction activities for each utility agency would generally follow a sequential set of

activities performed by a number of small crews proceeding along the length of the ROW. Construction activities, including construction of temporary and permanent access roads, would be coordinated among the various utility agencies sharing the permitted ROW. To supply electrical power to the well fields, it is anticipated that LCPD would be the first utility agency to begin construction after all approvals have been acquired. The following subsection describes the general sequence of construction activities for the groundwater, electric utilities, and fiber optic lines.

Construction of the electric utility, communication, and groundwater facilities would involve the following sequence and would be coordinated among all utilities:

- Engineering surveys and staking;
- Topsoil salvage and storage (applicable to all construction activities);
- Clearing and grading including access road construction;
- Trenching and blasting;
- (Electric Transmission Lines) – Preparation of wire handling areas and laydown sites, structure holes, structure assembly and erection, conductor shield wire stringing (electric facilities);
- (Substations) – Pouring of concrete foundations and ground grid; Installation of below-grade raceway; Installation of equipment, structural steel, and bus; Installation of above-grade raceway; Construction of control building; Installation of low-voltage wiring; Installation of security fencing; Yard surfacing; and Equipment testing;
- (Groundwater Facilities) – Pipeline stringing/installation; Installation of fiber optic line in common pipeline trench; Backfilling; Hydrostatic testing;
- Regrading, post-construction cleanup, and reclamation (would be conducted by each utility at the end of each construction spread); and
- Construction monitoring.

2.1.2.1 Survey and Staking

The first step of construction would involve marking the construction ROW boundaries and additional temporary work space areas and flagging the locations of approved roads and environmentally sensitive areas. Pre-construction surveys would be required prior to any ground disturbing activities. Appropriate actions would be taken to avoid disturbance of plants and wildlife identified as requiring protection during the biological survey. Survey activities would begin approximately 1 to 2 months prior to the start of construction.

2.1.2.2 Topsoil Salvage and Storage

Topsoil would be handled to salvage, store, protect, and redistribute the highest quality soils suitable for revegetation and for maintenance of surface color. Topsoil stripping width, depth, and storage are expected to vary along the permitted corridor depending on criteria such as: potential safety hazards, construction techniques, land use, soil characteristics, grading

requirements, slope, the amount of traffic expected over a particular construction segment, vegetation, and methods for crossing dry washes and roads. Topsoil salvage and storage would be accomplished in accordance with the commitments listed in **Appendix C –** *Standard Construction and Operation Procedures*. Topsoil salvage procedures are depicted on **Figure 2-12**.

2.1.2.3 Clearing and Grading

Before clearing and grading activities are conducted, fences would be braced and cut, and temporary gates and fences would be installed to contain livestock, if present. Grading would be conducted where necessary to provide a reasonably level work surface. Where the ground is relatively flat and does not require grading, rootstock would be left in the ground. More extensive grading would be required in steep side slopes or vertical areas and where necessary to prevent excessive bending of the pipeline.

To the extent practicable, native shrubs and other vegetation would be preserved and protected during construction operations. In all cases, clearing would be restricted to only those areas that require clearing or grading for construction activities. The utility centerline and margins would be staked and flagged to identify permitted ROW boundaries. BMPs for clearing and grading activities are listed in **Appendix C -** *Standard Construction and Operation Procedures*.

2.1.2.4 Trenching and Blasting

An excavator or trenching machine, haul trucks, and necessary traffic control mechanisms would be used in the excavation of the pipeline trench. In general, pipeline installation can be accomplished at a rate of 140 to 600 feet per day depending on the site conditions (e.g., within an existing roadway corridor or in cross-country areas). Trenching activities would consist of excavating the trench using either a trenching machine or track-mounted excavator. A conventional excavator would be used wherever a deeper and wider than normal trench is required, such as at tie-in locations, access manways, fiber optic slice vaults, hydrostatic test manifold sites, and pipeline valve locations.

Unless land uses and permits dictate a greater width, the bottom of the trench would generally be 60 inches wide and sufficiently deep (up to 6 feet) to provide the required cover over the top of the installed pipe. In areas of weathered rock, track-mounted excavators may be preceded by a bulldozer equipped with a single-shank ripper. Limited blasting may be required in areas where shallow or exposed bedrock is present. If blasting were required, strict safety precautions would be followed including compliance with federal, state, and local codes and ordinances and manufacturer's prescribed safety procedures and industry practices. Standard construction and operation procedures for trenching and blasting activities would be conducted in accordance with commitments listed in **Appendix C**.

Trenching activities would be conducted in a manner that reduces impacts on wildlife. Temporary wildlife barrier fencing would be installed to make access into the trench difficult. Dirt ramps and trench spurs would be constructed at an angle of less than 45 degrees to the horizontal to allow for the escape of wildlife if they fell into the trench. Those animals that are able to bypass the fencing and fall into the trench could use the soil ramp to escape.

2.1.2.5 Construction of the Electric Utility Facilities

Construction of the overhead lines would be completed in two phases: setting the pole structures and installing the conductor wire. The setting of the pole structures is accomplished with a single multi-purpose truck. The truck has a small crane suitable for lifting and placing poles. A pole trailer is towed behind the crane truck to transport the poles to the installation site. Affixed to the crane is an auger for boring the holes for the pole structures. Soil excavated during construction would be used for backfill and for restoration of disturbed areas.

The conductor wire would be installed using two vehicles: a conductor wire truck and a truck with a power lift. The conductor wire would be strung out along the installation route, and the man lift would be used to place the conductor wire on the pole structure. Overhead lines would be designed to Avian Power Line Interaction Committee (APLIC) specifications to minimize raptor electrocution risk (APLIC 1996).

Construction of each substation would involve site grading, installing gravel material within the fenced area of the substation, constructing concrete foundations for the transformers and other components within the substation, installing substation equipment, and erecting a chain link security fence around the substation perimeter. The area would be secured and limited to authorized personnel during construction and operation.

All components of the electric utility facilities would be designed in accordance with the requirements of the latest edition of the National Electric Safety Code, the latest edition of the National Electrical Code, and the standards of the Rural Utility Service of the U.S. Department of Agriculture.

2.1.2.6 Installation of Groundwater Pipeline and Fiber Optic Line

Pipe stringing involves trucking the pipe into position along the staked construction ROW in preparation for installation. The pipe would be staged adjacent to the trench and spaced so that it is easily accessible to construction personnel. Sufficient pipe necessary for dry wash or road crossings would be stockpiled at extra work space areas in the vicinity of each crossing. The rate of pipeline installation would vary depending on installation method and local site conditions and can range from 140 to 600 feet per day.

Before the pipeline is lowered in, the trench would be inspected to make sure it was free of trapped wildlife as well as rocks and other debris that could damage the pipe or protective coating. Side-boom tractors or track-mounted excavators would be used to lower the pipe into the excavated trench. If the bottom of the trench is located in rock, pipe supports, sand, soil padding (not topsoil) or other means would be used to protect the pipe before it is lowered into the trench.

The fiber optic cable would be buried in a common trench with the pipeline. It is anticipated that a large portion of the excavated native subsoils encountered during construction would be suitable backfill material. If deemed appropriate, the excavated subsoil would be screened and used as pipe bedding material during installation. Topsoil would not be used for backfill. The use of native material would reduce the amount of imported material hauled into the area and also minimize the disposal of excavated spoils and the amount of truck traffic on access roads

and along the ROW. Screened byproducts would be used in intermediate backfill or hauled off site to an approved location. Excess soils are not anticipated.

2.1.2.7 Construction of Storage Tanks

Construction of the groundwater storage tanks would follow a standard sequence of activities: clearing and grading, installing the proposed facilities, and erecting the appropriate structures and components. Construction activities and the storage of building materials would be confined to the designated work areas within the permitted ROW.

2.1.2.8 Construction of the Natural Gas Facilities

Large trenchers or trackhoes would be used to excavate the natural gas pipeline trench, one from the north end of the project, and a second "spread" starting at the south end of the project. The trench would be approximately 6 to 7 feet deep depending on existing grade, to a depth that allows for minimum coverage over the pipeline as determined by Department of Transportation (DOT) Part 192.319 and DOT Part 192.327. The trench would be approximately 24 inches wide. The topsoil (3 to 6 inches) will be stockpiled first so that it can be placed over the filled trench last. If native sand is not available, sand will be brought in from commercial sources to cover the pipe; native material would be used for backfill. A water truck would be used for dust control, and pooling of water would be prevented so as not to attract desert tortoises to the project area. Excavated trenches would be inspected daily by an environmental inspector to remove any trapped wildlife.

The pipe would be delivered by truck from the factory in 40-foot or 60-foot lengths, referred to as joints, and laid out on skids along the pipeline route ROW. The pipe is typically strung and stockpiled along the proposed route directly from the truck to avoid unloading within a staging area and then moving the materials to the construction area. Using mechanical bending equipment, the pipe would be bent to conform to the contours of the trench.

The pipe would be lifted and placed on wooden sills (railroad ties) for electric arc welding. Welding procedures would meet or exceed American Petroleum Institute standard 1104. Pipe joints would be welded together into a continuous pipeline. Before lowering the pipe into the trench, the welds would be non-destructively tested using a radiographic X-ray to determine if there are any defects. This procedure and frequency of testing are determined by DOT Part 192.241- 245. Third-party inspectors review the testing results and, if any defects are detected, they are cut out, rewelded, and reinspected.

Once the welds have passed the non-destructive inspection, the welded joints are primed with paint and taped for protection from corrosion. The pipe is then lowered into the trench using sidebooms.

The pipeline will be protected from corrosion by either impressed current or galvanic anodes in accordance with the requirements of DOT Part 192.451. Impressed current systems use an anode ground bed installed by drilling shallow wells, inserting the anodes (graphite), immediately backfilling around the anodes with coke breeze (carbon), and then backfilling to the surface with either native soil or imported bentonite (clay) depending on the permitting requirements of the governing body. To complete the impressed current system, the ground bed is connected to a

rectifier, which is connected to the pipeline. An impressed current system for this size piping system would normally be required at only one point along the pipeline. A galvanic anode system uses individual anodes (zinc) buried alongside the pipeline at periodic locations.

2.1.2.9 Hydrostatic Testing

Hydrostatic testing would be conducted to verify the integrity of the groundwater and natural gas pipelines. Pipeline integrity is tested by capping pipeline segments with test manifolds, filling the capped segments with pressurized water, and holding the water for at least 4 hours. Any significant loss of pressure indicates a potential leak and may require further inspection.

Approximately 32 million gallons of water would be required for testing the entire water transmission pipeline. Assuming a 10-inch-diameter natural gas pipeline, approximately 300,000 gallons of water would be required for testing the natural gas pipeline. This volume of water would change if the final design of the natural gas pipeline requires a different diameter pipeline.

Both LCWD and Southwest Gas must obtain temporary discharge permits for conducting hydrostatic testing of their respective pipelines. These permits are issued by the NDEP Bureau of Water Pollution Control, and include provisions requiring the user to implement controls to minimize erosion or sedimentation from discharge activities. The primary source of water for hydrostatic testing would be from the production wells.

The volume of water used to test each pipeline segment would be pushed by air through the pipeline to each successive pipeline segment. Test water would be transferred between pipeline segments where possible to minimize the amount of water required. Excess water would be discharged into natural drainage areas around each site. If deemed necessary, dechlorinization would be used as appropriate. A diffuser, rock rip-rap, or other erosion control measure would be used to reduce discharge rates to prevent scouring. Energy dissipation materials will be removed upon completion of hydrostatic testing and disturbed areas will be reclaimed in accordance with project POD and applicable regulations.

2.1.2.10 Grading and Post Construction Cleanup

Following backfill, areas within the ROW disturbed by construction operations would be re-graded where necessary to the approximate original contour with allowance for settling, particularly over the trench. The contractor would check for surface compaction at areas occupied by equipment during construction (e.g., the working side of the ROW or staging areas). Compacted soils would be either ripped or harrowed.

Reclamation would include recontouring of impacted areas to match the surrounding terrain, cleaning trash out of gullies, and restoring terraces. Any remaining natural debris or rocks that have not been intentionally left on the ROW would be disposed of in accordance with BLM requirements. After final cleanup, the BLM would be contacted to verify that post-construction commitments for the ROW(s) and other component sites are satisfied.

The contractor(s) would be required to have a continuous cleanup program throughout construction. Restoration would include the removal of deep ruts and the disposal of foreign

objects such as slash, chunks of concrete, pile cut-off, and construction materials. Waste materials and debris from construction areas would be collected, hauled away, or disposed of at approved landfill sites.

2.1.2.11 Topsoil Redistribution

Soil stabilization measures would be initiated after construction ceases. Topsoil would be evenly distributed across areas from where it was salvaged and seeded with native, drought-tolerant species of plants as directed by the BLM. The contractor(s) would be responsible for replacement of lost or degraded (mixed) topsoil with topsoil imported from a weed-free source approved by the BLM. Restored topsoil will be left in a roughened condition to discourage erosion and enhance the quality of the seedbed.

2.1.2.12 Operation and Maintenance

Water facilities would be operated and maintained in accordance with standard procedures to ensure safe operation and integrity of the pipeline. The operation and maintenance of the pipeline would be performed by qualified and trained employees. Personnel would be capable of monitoring the operating conditions as well as controlling flows and pressures through the pipeline.

The pipeline and associated groundwater components would be inspected regularly to identify potential pipeline breaks or leaks. Any large break would be immediately identified through an accounting process that compares delivery amounts to the pumped amount. Based on this accounting process, breaks would be identified and isolated. The typical method to minimize damage to soils would be to shut down the pumps as soon as possible, then close the nearest isolation valves on the upstream side of the break. The nearest downstream isolation valve would be closed if the break occurred in a low point where flow could come from both directions.

The environmental consequences of a break would be soil erosion from the location of the break to the surrounding drainage area. Typically, the path of least resistance would be along the existing pipeline trench; however, it is possible that areas between the trench and the drainage area could be affected. If a pipeline break were to occur, the LCWD or its contractor would take immediate action to isolate the break. Following isolation, the break would be repaired, and the immediate trench area backfilled and compacted to support the pipe so that normal operations could resume as soon as possible.

Prior to site reclamation, the BLM would be notified of the break to allow inspection of the site. Following consultation with the BLM, all areas would be filled, contoured, and revegetated to as close to the previous state as possible.

After the electric utility system has been energized, the electrical facilities would be in virtually continuous operation. Periodic inspection and maintenance of the transmission line and substation facilities are required to maintain safe and reliable operation. The electrical equipment and wood poles are anticipated to have a lifetime of approximately 50 to 60 years or more depending on the maintenance operations and climatic conditions. Emergency maintenance, such as repairing downed wires during storms and correcting unexpected outages,

would be performed as needed.

The proposed natural gas pipeline would be added to Southwest Gas' existing pipeline inspection program. Continuous surveillance of Southwest Gas' pipeline system is conducted according to the U.S. Department of Transportation (USDOT) requirements to determine the appropriate action concerning possible changes in class location, failures, USDOT notification, leakage history, corrosion, substantial changes in cathodic protection requirements, and other unusual operating conditions. Safety-related conditions would be reported as required to the USDOT and to other appropriate federal and state agencies.

The natural gas pipeline ROW, pipeline leak surveys, and cathodic protection maintenance would be inspected following USDOT and Southwest Gas' internal requirements. Pipeline markers and signs would be inspected and maintained or replaced, as necessary, to ensure the pipeline location is visible from the ground.

The ROWs would be maintained routinely. This would include utilizing existing trails and paths to gain access along the pipelines as close as possible to the permanent ROWs. Pipeline markers would be installed along the pipeline route to notify the public that a pipeline is buried in the vicinity. The markers would provide a telephone number for contractors and individuals to call prior to digging on or near the pipeline ROWs. Because most operation of facilities is by remote control, site visits would mainly be related to inspection and maintenance.

2.1.2.13 Abandonment

Should operation of the groundwater and natural gas facilities cease, the aboveground structures and equipment would be removed and salvaged per BLM's requirements. In most cases, the pipelines would be purged, capped, and abandoned in place. Any areas disturbed during abandonment would be revegetated and restored in accordance with the BLM requirements in effect at the time.

The electric utility facilities would become a permanent portion of the ROW holders system. Facilities are planned for a 50- to 60-year life with anticipated indefinite extension through repair and replacement of equipment and material.

2.1.2.14 Applicant Proposed Environmental Protection Measures

Applicant-proposed measures to reduce or minimize construction-related impacts are outlined in **Appendix C**. In addition, the LCWD and LCPD have prepared specific plans that include measures to avoid or reduce potential impacts from the Proposed Action. These supplemental plans were included as appendices in the draft POD submitted by the LCWD as part of the ROW application. A final POD would be required by the BLM prior to any project-related grants of ROW. If the project is approved, the POD and any additional site-specific stipulations that are determined to be necessary on federal lands would be appended to the ROW issued by the BLM. The supplemental plans in the POD for the Proposed Action are described in **Table 2-2**.

Table 2-2 Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan[1]	Description Summary/Highlights	Resource Element
Environmental Management Plan	• Describes procedures the LCWD and its construction and reclamation contractors would use during construction and reclamation of the Proposed Action to ensure compliance with environmental requirements and conditions stipulated in the POD. • The LCWD would use the Environmental Management Plan to coordinate procedures that minimize impacts to environmental resources during construction and operation of the Proposed Action. • The LCWD would employ on-site Construction and Environmental Inspectors to ensure compliance with all regulatory requirements.	Includes measures designed to reduce or minimize construction-related impacts on: • Soil Resources • Water Resources • Vegetation Communities • Wildlife Habitat • Air Quality • Cultural and Historic Resources
SWPPP	• Describes measures to protect water quality and manage storm water during construction-related activities. • Identifies BMPs to reduce the introduction of pollutants to storm water, remove excess sediments from storm water before flowing off site, and reduce the velocity of storm water flowing off site. • BMPs implementation, coupled with the reestablishment of existing contours and vegetation along the project corridor, would minimize the potential for erosion.	Includes measures designed to reduce or minimize construction-related impacts on: • Soil Resources • Water Resources • Vegetation Communities • Wildlife Habitat • Air Quality
Revegetation Plan	• Describes procedures the LCWD and its contractors would use to revegetate the disturbed areas. • Describes seedbed preparation, seed mixtures, seeding, salvaging and transplanting methods, revegetation schedule, post-construction monitoring, and evaluation of revegetation success, remediation, and reporting. • Post-construction monitoring would be conducted by the LCWD or its successors or assignees.	Includes measures designed to reduce or minimize construction-related impacts on: • Soil Resources • Water Resources • Vegetation Communities • Wildlife Habitat • Air Quality
Fire Mitigation Plan	• Identifies measures to be taken during construction, operation, and maintenance of the project facilities to prevent and suppress fires. • The purpose is to establish standards and practices to minimize the risk of fire or, in the event of fire, to implement immediate suppression procedures.	Includes measures designed to reduce or minimize construction-related impacts on: • Soil Resources • Water Resources • Vegetation Communities • Wildlife Habitat • Air Quality

Table 2-2 Summary of Supplemental Plans that Include Measures to Minimize Impacts to Environmental Resources

Plan[1]	Description Summary/Highlights	Resource Element
Dust Control Plan	• Describes dust control measures the LCWD and its construction and reclamation contractors would implement during project construction in accordance with local regulations. • Designed to comply with the NDEP – Bureau of Air Pollution Control Surface Area Disturbance Permit requirements.	Includes measures designed to reduce or minimize short-term construction-related impacts on air quality.
SPCC Plan	• Describes spill prevention practices, emergency response procedures, emergency and personnel protection equipment, release notification procedures, and cleanup procedures.	Includes measures designed to reduce impacts to water quality from inadvertent spills or leaks.
Noxious Weed Management Plan	• Includes site-specific measures that the LCWD and its contractors would implement to control noxious weeds including, but not limited to, the use of cleaned, weed-free equipment; pressure washing of all vehicles and equipment prior to arrival at the work site; and the use of certified weed-free straw/hay bales to control erosion. • A key element of the Noxious Weed Management Plan is to identify and treat existing weed infestations prior to construction.	Includes measures to reduce the spread of noxious weed and impacts to vegetation communities and wildlife habitats.
Access Road Plan	• Describes measures to be taken by the LCWD or its contractors to access project facilities and the ROW, reclaim temporary access roads, and prevent unauthorized vehicle use of the project ROW. • Includes descriptions of access routes and transportation-related activities.	Includes measures to minimize the use of access roads, thereby reducing potential impacts to vegetation communities, wildlife habitat, potential spread of noxious weeds and potential for air quality issues, sedimentation, and erosion.
Hydrostatic Test Dewatering Plan	• Identifies the sources and volumes of water that would be used to test the pipe prior to operation and the discharge locations.	Includes measures designed to reduce impacts to surface water drainages from hydrostatic test water discharges.
Blasting Plan	• Identifies blasting procedures including safety, use, storage, and transportation of explosives that are consistent with minimum safety requirements as defined by federal, state, and local regulations.	Includes measures to reduce health and safety impacts to construction crew, vegetation communities, and wildlife habitat.

[1]Refer to **Appendix C** for representative specific mitigation measures applicable to the above summarized supplemental plans. All plans included in the Applicants' POD.

BMP – Best Management Practice; LCWD – Lincoln County Water District; NDEP – Nevada Division of Environmental Protection; POD – Plan of Development; ROW – right-of-way; SPCC – Spill Prevention, Containment, and Countermeasure Plan; SWPPP – Storm Water Pollution Prevention Plan

2.2 ALTERNATIVE 1 – LINCOLN COUNTY CONSERVATION, RECREATION, AND DEVELOPMENT ACT CORRIDOR

Under Alternative 1, the proposed ROW alignment would be the same as that for the Proposed Action from the Clover Valley to MW-2. From MW-2, the Alternative 1 ROW alignment would deviate from the Proposed Action alignment and would remain in the LCCRDA corridor, continuing generally south-southeast, where it would terminate at the northwest corner of the LCLA development area. Project facilities to be constructed under Alternative 1 are the same as those to be constructed under the Proposed Action. Alternative 1 is depicted on **Map 2-1**.

Preconstruction clearances would be required prior to any ground-disturbing activities. At a minimum, access would require completion of cultural resource surveys and biological surveys, along with appropriate SHPO and USFWS consultation and approvals.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative represents the status quo — not approving or implementing the Proposed Action or Alternative 1. Analysis of the No Action Alternative is required by NEPA guidelines. Under the No Action Alternative, the BLM would not approve the LCWD's ROW application as submitted, and the Proposed Action would not be constructed on federally managed lands. As a result, impacts associated with construction and operation of the Proposed Action on public land would not occur. The NSE has permitted the pumping 2,100 AFY of groundwater from the Tule Desert Hydrographic Area. Selection of the No Action Alternative would not preclude the LCWD from pumping their permitted water rights on non-federal land in accordance with the NSE's Ruling, nor would it preclude another entity from constructing other projects within the same corridor, subject to approval by the BLM.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

An interdisciplinary (ID) Team of resource specialists from various BLM offices, representatives from cooperating agencies, the Applicant's consultants, and the EIS consultant team were assembled to assist in evaluating the environmental issues to be addressed in the EIS. The ID Team analyzed the Proposed Action, Alternatives to the Proposed Action, and the No Action Alternative. The following criteria were used to establish a threshold for developing potential alternatives that respond to the purpose of, and need for, the Proposed Action and meet the BLM policy and direction.

- The alternative should be consistent with management guidance contained in the approved Caliente MFP and other applicable BLM policy and direction.
- The alternative must meet the purpose of and need for action.
- The alternative must be feasible from technical and economic standpoints while remaining environmentally responsible.
- The alternative must be capable of implementation in a timely manner.

In addition to the Proposed Action and No Action Alternative, one other alternative (Alternative 1) was identified for detailed study. Several other alternatives were considered during initial project planning. They included locating the proposed terminal storage tank on public lands, burying the electrical lines, and installing aboveground pipelines instead of burying the pipelines. These alternatives were eliminated from detailed analysis because they were not reasonable or were not feasible from a technical or economic standpoint. More detail is provided in the following subsections.

2.4.1 Aboveground Water Transmission Pipeline

This alternative would involve constructing the water transmission pipeline aboveground over the entire distance. Constructing the water transmission pipeline aboveground would result in greater visual impacts and may act as a barrier to wildlife. The potential for vandalism and road safety issues would also be greater. Also, this alternative would result in greater surface disturbance of vegetation and related impacts to desert tortoise habitat. This alternative does not appear to offer any environmental advantage over the Proposed Action or Alternative 1.

2.4.2 Underground Electrical Transmission and Distribution Lines

Selection of this alternative would require the transmission line and distribution lines to be buried. This alternative was eliminated from further analysis in the Draft EIS because, while it is technically feasible to bury transmission lines, it is not cost-effective for construction and maintenance. The cost of burying transmission lines is estimated to be 7.5 to 12 times higher than traditional overhead construction for a given project (Johnson 2003). Also, this alternative would result in greater surface disturbance of vegetation and related impacts to desert tortoise habitat. This alternative does not appear to offer any environmental advantage over the Proposed Action or Alternative 1. It is standard operational procedure for transmission lines within road ROWs to be constructed aboveground to minimize infrastructure constraints within public easements (e.g., installation of public works such as water pipeline and sewer).

2.5 AGENCY PREFERRED ALTERNATIVE

The Agency Preferred Alternative is the Proposed Action.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Geological Resources – Sections 3.1 and 4.1		
The Proposed Action would not result in impacts to geologic resources. However, seismic activity in the region could potentially impact the structures and facilities constructed under the Proposed Action. All project components would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize any potential impacts to structures from seismic activity.	Impacts to geological resources under Alternative 1 would be same as those described under the Proposed Action (i.e., no impact).	No project-related impacts to geological resources would occur on public lands.
Soil Resources – Sections 3.2 and 4.2		
Potential direct impacts to soil resources associated with construction activities could include increased soil compaction and erosion from wind and water, and chemical changes resulting from mixing surface soils with subsurface during salvage activities. Temporary disturbance would be 1,878 acres, and permanent disturbance would be 240 acres. There would be no direct or indirect impacts to soil resources associated with operation and maintenance of the Proposed Action. Site-specific BMPs to minimize soil erosion and sedimentation would be implemented during construction. The selected erosion and sediment control BMPs and environmental protection measures would be based on the type of disturbance expected, soil type, and the location of the site relative to sensitive resources.	Impacts to soil resources under Alternative 1 would be the same as those described under the Proposed Action. The Proposed Action and Alternative 1 differ primarily in the location of the proposed ROW alignment in the Tule Desert. The acreages of particular soil types disturbed under Alternative 1 would vary slightly from those of the Proposed Action; however, the impacts would be the same.	No project-related impacts to soil resources would occur on public lands.
Water Resources – Sections 3.3 and 4.3		
Potential impacts to surface water may include increased erosion and sedimentation from surface disturbance related to construction activities and hydrostatic testing water discharges, and impacts to water quality from accidental spills. Potential direct impacts to groundwater include impacts to groundwater quantity as a result of drawdown (lowering of the water table) within the well head, and potential indirect impacts may be related to lowered yields at local and regional groundwater and surface water expressions.	Impacts to water resources under Alternative 1 would be the same as those described under the Proposed Action.	No project-related impacts to water resources would occur on public lands.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Although impacts are not anticipated from proposed pumping in the Tule Desert, uncertainties would be managed pursuant to the Stipulation Agreement between the NPS and then LCWD. The Stipulation Agreement outlines action criteria to provide early warning of adverse impacts to the state and/or federal water rights of the NPS. Groundwater pumping associated with the Proposed Action will also be subject to terms and conditions imposed by the NSE. In addition, the LCWD intends to monitor the groundwater and surface water resources in Clover Valley, as outlined in the Water Resources Monitoring and Management Plan.		
Vegetation Resources – Sections 3.4 and 4.4		
Potential direct impacts to vegetation resources associated with construction activities could include crushing and/or removal of native vegetation and introduction of invasive and noxious weeds. Temporary disturbance would be 1,878 acres, and permanent disturbance would be 240 acres. There would be no direct or indirect impacts to vegetation resources associated with operation and maintenance of the Proposed Action. No potential habitats for federally listed threatened or endangered species occur within the Proposed Action ROW. However, 72 acres of occupied habitat for the Las Vegas buckwheat, a candidate for listing under the Endangered Species Act exists near the project area. Populations of BLM Sensitive species Needle Mountain milkvetch, sticky buckwheat, Parry's sandpaper plant, and Palmer's phacelia were found within the project area. While construction activities may result in the destruction of a few individuals of all these species, populations are not expected to be impacted over the long term. Cacti species protected by Nevada law would be salvaged and restored as a part of the Proposed Action's Reclamation Plan.	The types and magnitudes of impacts resulting from Alternative 1 would be similar to those described for the Proposed Action. Alternative 1 would result in 1,733 acres of temporary disturbance and 221 acres of permanent disturbance. Impacts to BLM Sensitive plant species would be less than the Proposed Action because Alternative 1 does not cross Toquop Wash where Parry's sandpaper plant and Palmer's phacelia are known to occur.	No project-related impacts to vegetation resources would occur on public lands.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Wildlife Resources – Sections 3.5 and 4.5		
Direct effects on wildlife resources can result from ground disturbance caused by construction-related activities, which can impact wildlife habitat by removing vegetation, altering plant composition or structure, and/or by altering soil characteristics. Potential indirect effects during construction activities include degradation of soil due to fuel contamination, harassment from human presence, and increased levels of noise and vibration due to construction, equipment movement, or blasting. Long-term direct impacts can occur from loss of vegetation and wildlife habitat resulting from continued disturbance from operation and maintenance. Additionally, wildlife species could be temporarily displaced from areas of human activity during operation and maintenance activities. Indirect long-term impacts can result from increased public access and project maintenance. Impacts to surface water and/or spring discharges (that act as habitat for several species) resulting from groundwater pumping are not expected. The desert tortoise is the only federally listed species that occurs within the Proposed Action ROW. Approximately 108 acres of desert tortoise habitat would be permanently disturbed, and 848.5 acres would be temporarily disturbed by construction of the Proposed Action. In consultation with the USFWS and BLM biologists, the Applicant and its contractors would incorporate desert tortoise protections measures to reduce the potential for effects associated with the Proposed Action. Additionally, the LCWD and/or the other utility agencies would be required to pay a remuneration fee for each acre of surface disturbance to desert tortoise habitat. There is no suitable habitat for the southwestern willow flycatcher in the project area; however, the southwestern willow flycatcher and its riparian habitat have been documented in the ROI. Because groundwater removal is not expected to affect surface waters, construction, operation, and maintenance of the Proposed Action	Alternative 1 would result in temporary disturbance to 1,733 acres of wildlife habitat and approximately 221 acres of permanent disturbance. Following construction, disturbed acres would be reclaimed to pre-construction conditions, except for the access road and other permanent project features. Disturbance to desert tortoise habitat under Alternative 1 would be slightly lower than that under the Proposed Action. Approximately 88.9 acres (19.1 acres less than the Proposed Action) of desert tortoise habitat would be permanently disturbed by construction of Alternative 1. Approximately 696.8 acres would be temporarily disturbed (151.7 acres less than the proposed action). Of these totals, 30.2 acres (BLM lands) of permanent disturbance would occur in the Beaver Dam Slope Critical Habitat Unit (2.1 acres less than the Proposed Action). Approximately 236.6 acres of temporary disturbance would occur in the Beaver Dam Slope Critical Habitat Unit (17.1 acres less than the Proposed Action). Permanent and temporary disturbance for Alternative 1 make up 0.03 and 0.3 percent of the Beaver Dam Slope Critical Habitat Unit in Nevada, respectively. As described for the Proposed Action, the environmental protection measures that would be implemented as part of this alternative would reduce potential direct impacts to fish and wildlife species. Impacts to other wildlife species would be the same as the Proposed Action.	No project-related impacts to wildlife resources would occur on public lands.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
will not directly or indirectly impact the southwestern willow flycatcher or its habitat or Designated Critical Habitat. There is no habitat for the Yuma clapper rail within the project area. The closest potential habitat for the Yuma clapper rail to the project area is along the Virgin River, approximately 3 miles south of the southern end of the LCLA development area and within the ROI. Because groundwater removal is not expected to affect surface waters, construction, operation, and maintenance of the Proposed Action will not directly or indirectly impact the Yuma clapper rail or its habitat. There is no habitat for the western yellow-billed cuckoo within the project area. Suitable riparian habitat for the western yellow-billed cuckoo occurs within the ROI in the Meadow Valley Wash and along the Virgin River. This species has also been documented within Meadow Valley Wash. Because groundwater removal is not expected to affect surface waters, construction, operation, and maintenance of the Proposed Action will not directly or indirectly impact the western yellow-billed cuckoo or its habitat. There is no habitat for the Virgin River chub or the woundfin within the project area. Within the ROI, the Virgin River near Mesquite, Nevada is the closest potential habitat for the endemic Virgin River chub and woundfin. This area is approximately 3 miles south of the LCLA development area. Because groundwater removal is not expected to affect surface waters, construction, operation, and maintenance of the Proposed Action will not directly or indirectly impact Virgin River fish species or their habitat. Potential impacts to Nevada BLM Sensitive and/or state protected species, including banded Gila monster, chuckwalla, and western burrowing owl, would be mitigated by specific protection measures described in the Standard Construction and Operation Procedures in Appendix C for the EIS. Direct impacts to birds in the vicinity of the project area include direct mortality from increased human traffic during operation and		

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
maintenance activities, direct disturbance of nests, and nest abandonment as a result of increase human presence and/or operation noise.		
Land Use – Sections 3.6 and 4.6		
Construction of the Proposed Action would temporarily disturb approximately 1,878 acres. Following construction, approximately 240 acres would be maintained as permanent ROW and aboveground facilities. The remaining 1,638 acres would be restored and allowed to revert to former use. Most of the ROW would be located within the designated LCCRDA utility corridor or along existing roads or other utility corridors. While land ownership would remain unchanged, grazing operations and public use of the area may experience short-term disruption during construction. Cattle or other livestock would need to be temporarily removed from the most intensive construction areas. The proposed pipelines would be buried and would not permanently restrict movement of cattle among pastures. Implementation of the Proposed Action, and the resultant groundwater pumping activities, would not reduce forage levels in the project area that would lead to a decrease in permitted AUMs within any active allotment. Implementation of the Proposed Action would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on dirt and gravel roads in the Tule Desert and Clover Valley areas may contribute to road deterioration. The LCWD has prepared an Access Road Plan which describes environmental protection measures and standard operating procedures for transportation-related activities. The Proposed Action would not affect access to, nor availability or development of, oil and gas or any locatable/saleable mineral resources in the project area.	Under Alternative 1, the pipeline segment at the southern end of the project area would be located entirely within the designated LCCRDA utility corridor. Temporary and permanent land use disturbance would be slightly less under Alternative 1. Temporary disturbance under Proposed Action – 1,878 acres; under Alternative 1 – approximately 1,733 acres. Permanent alteration under the Proposed Action – 240 acres; under Alternative 1 approximately 221 acres.	Land use would not change on federal lands. However, land use changes would continue on adjacent private lands including the build-out of the LCLA development area, Mesquite Lands Act area, and other approved developments.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Areas of Critical Environmental Concern, Wilderness, and Other Special Use Areas – Sections 3.7 and 4.7		
Under the Proposed Action, construction activities would occur adjacent to existing roads or within previously disturbed utility corridors. The exception is the segment between the permitted utility corridor east of the proposed Toquop Power Plant site at the north end of the LCLA development area. This segment of the Proposed Action is located within the Beaver Dam Slope ACEC. Construction activities would result in direct impacts to wildlife (desert tortoise habitat), soil, and vegetation resources within the ACEC. Indirect impacts may affect the Clover Mountain and Mormon Mountain Wildernesses as a result of increased noise, dust, odors, and traffic from construction activities in the Clover Valley and Tule Desert. However, these impacts would be temporary and localized. After construction, all areas not permanently impacted by a project facility would be reclaimed and revegetated to pre-construction conditions.	Under Alternative 1, the southern end of the proposed ROW would be located entirely within the designated LCCRDA utility corridor. Direct and indirect impacts to ACECs, wilderness, and special use areas would be similar to those described under the Proposed Action except that Alternative 1 would result in the construction of approximately 5 miles of new road (as opposed to 3 miles) through the Beaver Dam Slope ACEC.	There would be no project-related impacts to ACECs, wilderness, or other special use areas under the No Action Alternative.
Recreation – Sections 3.8 and 4.8		
Construction activities within the Clover Valley and Tule Desert areas may temporarily restrict access into the Clover Mountain and Mormon Mountains Wildernesses. The Proposed Action would not preclude the use of these areas, but rather would require recreational users to temporarily relocate to surrounding recreation areas if access roads are restricted due to construction. Operation and maintenance of the project facilities would not limit public access to recreation opportunities in the surrounding area.	Impacts to recreation under Alternative 1 would be the same as those described under the Proposed Action.	No project-related impacts to recreational use of public lands would occur under the No Action Alternative.
Air Quality – Sections 3.9 and 4.9		
Construction activities would result in temporary emissions of fugitive dust (particulate matter). These emissions would dissipate following completion of construction and would not be expected to travel great distances from the generation site. Temporary gaseous emissions would be generated during construction from diesel-powered well-drilling and other construction equipment. Emissions would be limited by state and federal regulations, and would be minimized through proper operation and maintenance.	Impacts to air quality under Alternative 1 would be the same as those described under the Proposed Action.	Under the No Action Alternative, there would be no short-term construction-related exhaust or fugitive dust impacts. No impacts to air quality would occur under the No Action Alternative.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Noise – Sections 3.10 and 4.10		
Major sources of noise associated with the Proposed Action would be from construction-related equipment and are predicted to be below levels of concern. Equipment used during construction activities would include standard construction and earth moving equipment and well development equipment such as drill rigs. Construction noise levels would be short-term, brief, and intermittent. Long-term noise levels associated with well head, pump station, and pipeline operations would generally be steady and continuous, and are predicted to be at lower levels than construction noise.	Impacts to noise under Alternative 1 would be same as those described under the Proposed Action.	Under the No Action Alternative, the Proposed Action would not be built on public lands. Therefore, there would be no short-term construction noise impacts nor any long-term operation impacts associated with the Proposed Action.
Visual Resources – Sections 3.11 and 4.11		
Short-term visual impacts would occur during construction as views of construction equipment, increased traffic, and construction activities are introduced into the local viewshed. Clearing and excavation activities associated with the installation of project components would remove vegetation communities within the pipeline alignment. Immediately following installation, these areas would be reclaimed and revegetated to pre-construction levels. The visual impact of vegetation removal would be minimal because of low color contrast associated with the characteristic vegetation and the underlying soils.	Impacts to visual resources under Alternative 1 would be similar to those described for the Proposed Action. However, under Alternative 1, the pipeline and aboveground facilities would be constructed entirely within the southern end of the LCCRDA corridor.	The No Action Alternative would result in no project-related impacts to visual resources because no new facilities would be constructed or operated on public lands.
Socioeconomic Resources – Sections 3.12 and 4.12		
Implementation of the Proposed Action would have a minimal affect on the social and economic resources from the associated increase in the level of economic activity. Increased economic activity would result from increased payroll earnings during project construction, which would be spent on items such as housing, food, goods, and services. The Proposed Action would not have direct growth-inducing effects because it requires a construction work force of no more than 160 workers for a period of 2 years and they would come from the existing construction workforce in the area. Indirect effects may result from continuing planned developments in Clark and Lincoln Counties.	Impacts to socioeconomic resources under Alternative 1 would be same as those described under the Proposed Action.	No project-related impacts to socioeconomic resources would occur.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
Environmental Justice – Sections 3.13 and 4.13		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations, because these populations are not present in the vicinity of the project area. Therefore, implementation of the Proposed Action would have no impact on environmental justice issues.	Impacts to environmental justice under Alternative 1 would be same as those described under the Proposed Action.	The No Action Alternative would result in no project-related impacts to environmental justice.
Hazardous Materials and Solid Waste – Sections 3.14 and 4.14		
Potential for accidental release of hazardous and toxic materials would be minimized through the implementation of Environmental Management Plan and SPCC Plan prepared by the LCWD as part of their POD. The amount of solid wastes generated from construction and operation would not affect the life expectancy of the municipal solid waste facilities currently operating in area. Any hazardous materials would be disposed at an EPA-approved hazardous waste facility. Therefore, there would be no impact from the Proposed Action on existing waste facilities in the region.	Impacts from hazardous materials and solid waste under Alternative 1 would be same as those described under the Proposed Action.	There would be no project-related hazardous materials or solid waste produced under the No Action Alternative.
Paleontological Resources – Sections 3.15 and 4.15		
No significant paleontological resources have been identified in the vicinity of the project area. Therefore, no known impacts would result from construction, operation, and maintenance of the Proposed Action. However, construction may result in unanticipated exposure of paleontological resources in Holocene and late Pleistocene deposits. If paleontological resources are discovered during construction, the BLM would be contacted, according to the SOPs in Appendix C, to determine steps necessary to evaluate the need to preserve the paleontological resources.	Impacts to paleontological resources under Alternative 1 would be the same as those described under the Proposed Action.	Under the No Action Alternative, no project-related impacts would occur to paleontological resources.

Table 2-3 Summary of Impacts by Resource for the Lincoln County Land Act Groundwater Development and Utility Right-of-Way Project Proposed Action, Alternative 1, and No Action Alternative		
Proposed Action	**Alternative 1**	**No Action Alternative**
Cultural and Historic Resources – Sections 3.16 and 4.16		
The Proposed Action may adversely affect 23 historic properties. The 23 historic properties include 21 prehistoric sites and two sites with both prehistoric and historic components. All of the sites have been recommended eligible for the NRHP under Criterion D, for the presence of archaeological deposits that may have the potential to yield information important in the history or prehistory of the region. Direct effects to historic properties would occur as a result of ground-disturbing activities associated with the construction and operation of the Proposed Action. Indirect effects would include the potential for artifact removal, feature damage, or the destruction of intact archaeological deposits made possible by improved public access. There have been no historic landscapes, rock art geoglyphs, or toolstone quarries identified in the project area that may be subject to indirect impacts. Treatment plans will be prepared in consultation with the BLM and the SHPO for each of the historic properties that may be affected. The preferred treatment, to the extent practicable, is avoidance and protection of the sites. If previously unidentified cultural resources (including human remains) are discovered, the procedures outlined in State Protocol Agreement, Section VIII (Discovery Situations) will be implemented.	All of the identified historic properties are within portions of the project area shared by the Proposed Action and Alternative 1. Adverse effects to historic properties under Alternative 1 would be same as those described under the Proposed Action.	No historic properties would be affected by project-related activities under the No Action Alternative.

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