Table 2-2 Preliminary Facility Dimensions			
Project Component	**Approximate Dimensions / Acreage**	**Dry-Cooled**	**Wet-Cooled**
Solar Fields	Two fields, Approximately 7,800 feet east-west by 11,000 feet north-south. Each field has a collector aperture area of approximately 2 million square meters. 1,970 acres	X	X
Power Blocks	One power block located in the center of each solar field; approximately 2,500 feet x 490 feet; 144 feet high for a dry-cooled tower, or 55 feet high for a wet-cooled tower (28 acres each)	X	X
Switchyard	400 feet x 400 feet (3.7 acres)	X	X
Assembly Hall/Maintenance Building	330 feet x 130 feet x 35 feet (1 acres)	X	X
Office	100 feet x 30 feet x 12 feet (.06 acres)	X	X
Parking Area	250 feet x 100 feet (0.5 acres)	X	X
Stormwater Detention Basin	1,200 feet x 1,200 feet (33 acres) – providing 122-acre-feet of storage assuming 4-foot-deep basin)	X	X
Evaporation Pond(s)	Up to two ponds; 800 feet x 1,250 feet each, approximately 46 acres total		X
Bioremediation Area	400 feet x 800 feet (7.3 acres)	X	X
[1] Components contained within the power block area are shown on Figure 2-6.			

A land survey of the proposed right-of-way is being performed to determine the final boundary and extent of the Project area. A topographic survey was performed to obtain one-foot contours for final engineering design for grading and drainage-related requirements. A preliminary geotechnical study of the Project site will be conducted to evaluate general subsurface conditions, seismicity, and other geological hazards and to provide recommendations for design and construction of the foundations for Project structures.

All plant facilities will be designed, constructed, and operated in accordance with applicable laws, ordinances, regulations, and standards. All generating facilities will be located within the facility fence line. Project-related linear facilities located outside the plant site fence line are limited to the selected access road and the wells and associated water pipelines to convey water to the site.

2.3.1 General Process Description

The solar power plant cycle basically consists of three distinct, coupled systems: the solar field and HTF system, the thermal energy storage system, and the power block. At the basic level, the HTF moves accumulated solar heat from the parabolic trough solar field to drive the turbine generator. The system distributes cold HTF from the power block to solar field collector loops, and collects hot HTF from the solar field, and inputs the collected heat to the feedwater/steam cycle. A schematic depicting this process is shown on Figure 2-5.

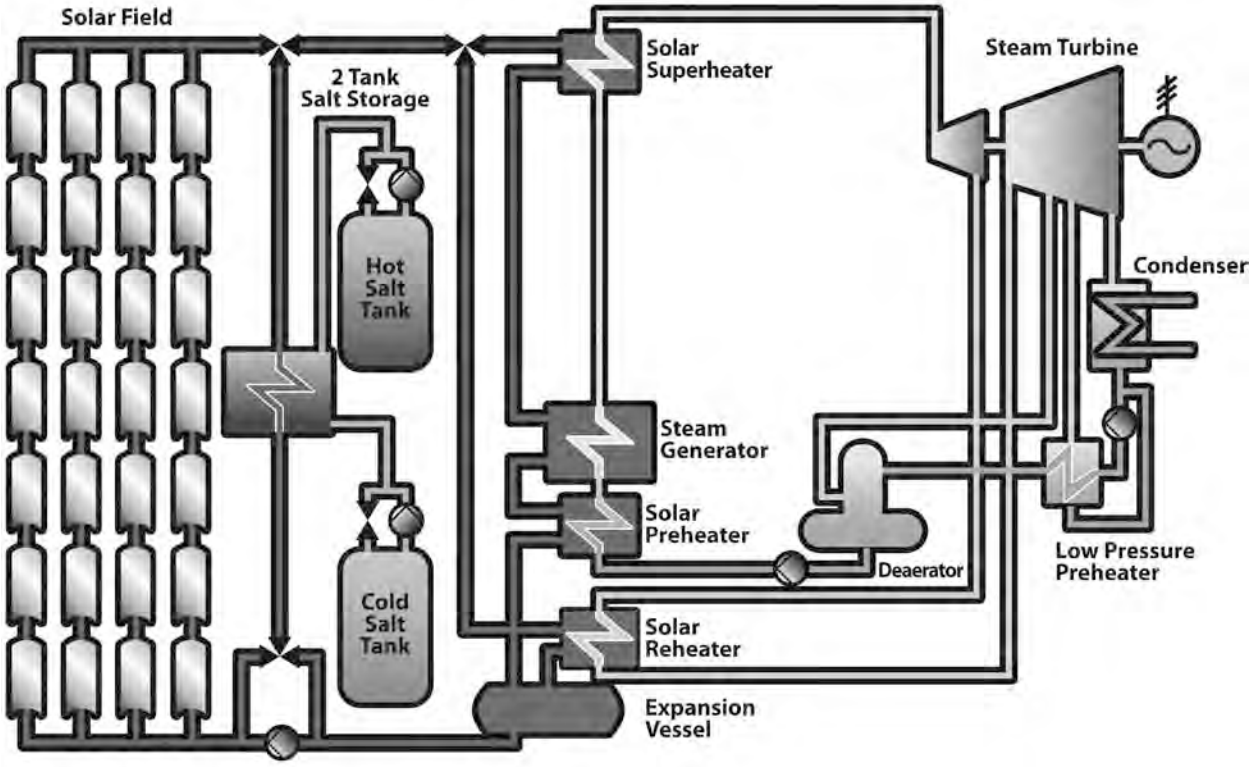


Figure 2-5 Plant Schematic Diagram (with thermal storage)

The HTF cycle is driven by two parallel pump stations. The nominal flow rate is about 2,800 kilograms per second (6,200 pounds per second). During operation, the HTF temperature varies from 739 °F (393 °C) ["hot"] after heating by the solar field to 565 °F (296 °C) ["cold"] leaving the power block heat exchangers. The hot HTF flows to parallel steam generation trains. Each train includes a preheater, steam generator, superheater and reheater. In normal operation, the hot HTF stream is split between the trains. It is also possible to remove each train from the loop via motor control valves.

As the solar field begins tracking the sun and the HTF heats up, its thermal expansion is accommodated in an expansion vessel. If the HTF in this vessel reaches its design working level it flows into overflow vessels. If thermal input to the HTF stops, the HTF begins to contract. The HTF level in the expansion vessel falls, and the overflow return pumps transfer the HTF from the overflow vessels back into the expansion vessel to maintain sufficient content at that location.

2.3.2 Solar Fields

Approximately 90 percent of the plant footprint is taken by the two parabolic trough solar field. The solar fields will be modular, distributed systems of 4 solar collector assemblies (SCAs), or *loops* connected in a series-parallel arrangement via a system of insulated pipes. A loop is approximately 72 feet wide and 2,790 feet long, and is designed to raise the temperature of the heat collection fluid by approximately 175 °F (79.4 ^{o}C). The collectors will be equipped with a sun tracking mechanism that moves the reflecting panels toward the sun to the optimum angle for solar energy collection.

2.3.2.1 Solar Collector Assemblies

The SCAs are oriented north and south and rotate east to west to track the sun as it moves across the sky throughout the day. The SCAs collect heat by means of linear troughs of parabolic reflectors that focus sunlight onto a straight line of heat collection elements (HCEs) welded along the focus of the parabolic trough. Each SCA includes local measurement instrumentation, a hydraulic drive system, and a controller that independently tracks the sun to maintain mirror focus on the HCEs and protects the HCEs from overheating.

Each SCA will be supported by structures (stands) that connect the parabolic troughs to the drive mechanism. Each array will be supported by multiple individual foundations with a foundation located approximately every 63 feet, along the assembly. Foundation design will be based on site-specific geotechnical conditions to ensure that the SCA stands are able to support all loading conditions (including wind loading) at the Project site.

2.3.2.2 Parabolic Trough Collector Loop

Each of the collector loops consist of two adjacent rows of SCAs, each row about 1,200 feet long. The two rows are connected by a crossover pipe. The HTF is heated to a high temperature as it circulates through the receiver tube and returns to a series of heat exchangers in the power block where the fluid is used to generate high-pressure superheated steam. The superheated steam is then fed to a conventional power block, consisting of a reheat steam turbine generator (STG) to produce electricity, and carried to a nearby substation via a project-specific transmission line. In normal operation, HTF enters the field at 565 °F (296 °C) and leaves the field at 739 °F (393 °C).

The HTF is a synthetic hydrocarbon liquid mixture of diphenyl ether and biphenyl oxide. Similar formulations are marketed by different manufacturers under the names of Therminol or Dowtherm. The HTF is not classified as a hazardous material by the U.S. Department of Transportation (USDOT), and is not listed under EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations. It has a crystallizing (freezing) point of about 54 °F (12 °C). Freeze protection is routinely accomplished by circulating HTF at a very low flow rate through the solar field using hot HTF from the vessel as a source.

2.3.2.3 Parabolic Mirrors

The parabolic mirrors to be used in the solar fields are low-iron glass mirrors, and are known to be one of the most reliable components in the SCAs. No long-term degradation of the mirrors has been observed at other solar thermal plants, and older mirrors can be brought back to nearly full reflectivity with simple cleaning. Typical life spans of the reflective mirrors are expected to be 30 years or more. The HCEs of the solar plant are comprised of a steel tube surrounded by an evacuated glass tube insulator. The steel tube has a coated surface that enhances its heat transfer properties with a high absorptivity for direct solar radiation, accompanied by low emissivity. Glass to metal seals and metal bellows are incorporated into the HCE to ensure a vacuum-tight enclosure. The enclosure protects the coated surface and reduces heat losses by acting as an insulator.

The glass tube cylinder has anti-reflective coating on both the inner and outer surfaces to reduce reflective losses off the glass tube, thereby increasing the transmissivity. Usually, to maintain the tube's insulating properties, getters, or scavengers, are installed in the vacuum space to absorb hydrogen and other gases that may permeate into the vacuum cylinder over time.

2.3.2.4 Process Control of the Solar Field

The solar field system operates under the control of the field supervisor controller (FSC), a computer located in the central control room that communicates with each SCA and with the plant's distributed control system (DCS). The FSC collects information from each SCA and from the DCS, and issues instructions to the field as a whole, and/or modular instructions to SCA loops or individual SCAs. It deploys the solar field during the day when weather and plant availability permit, and stows it at night and during high winds.

A weather station located in the power block area provides real-time measurements of weather conditions that affect the solar field operation. Radiation data are used to determine the performance of the solar field. Wind speed data are needed since under high wind conditions the solar field must be stowed. The FSC communicates with the plant's DCS, which coordinates and integrates power block, HTF system, and solar-field operation. The DCS communicates with all subsystem controls, including electrical system equipment, steam cycle controllers, variable frequency drives and balance of plant system controllers via serial data communications. It receives analog and digital inputs/outputs from all instruments and equipment not served directly by dedicated local controllers.

The DCS enters solar field control mode automatically after completing warm-up mode. At the beginning of warm up, the HTF is circulated through a bypass around the power block heat exchangers until the outlet temperature reaches the residual steam temperature in the heat exchangers. The HTF is then circulated through the heat exchangers and the bypass is closed. As the HTF temperature at the solar field outlet continues to rise, steam pressure builds up in the heat exchangers until the minimum turbine inlet conditions are reached, upon which the turbine can be started and run up to speed. The turbine is synchronized and loaded according to the design specification until its power output matches the full steady state solar field thermal output.

The DCS regulates the flow by controlling the HTF main pump speeds to maintain the solar field outlet temperature of approximately 739 °F (393 °C). Several HTF pumps will be operated in parallel, at the speed required to provide the required flow in the field, but in exceptional cases (e.g., during maintenance), lower numbers of pumps may be used alone, providing up to 70 percent of full flow at nominal pump capacity. If the thermal output of the solar field is higher than the design capacity of the steam generation system, the HTF flow is directed to the salt heat exchanger train. Cold salt is circulated from the cold salt tank, through the HTF heat exchangers, and into the hot salt storage tank. If both the steam generation train and salt heat exchanger trains are fully loaded, collectors within the solar field are de-focused to maintain design operating temperatures.

If the minimal thermal input to the turbine required by the operating strategy cannot be met under the prevalent weather conditions, then shutdown is indicated. Operators would track all solar collectors into the stow position, reduce the number of HTF main pumps to a minimum, and stop the HTF flow to the power block heat exchangers.

During periods when the solar power generating facility is shutdown, the HTF is circulated through the piping in the solar fields at low flow rate. For most of the year, under typical weather conditions, no supplemental heat is required to keep the HTF flowing freely. However, it is anticipated that on colder winter nights, supplemental heat will be required to ensure the HTF doesn't freeze in the piping. A gas-fired HTF heater, with a rated capacity of 35 million British thermal units per hour (MMBtu/hr), will be provided as part of the HTF system. It is expected that the HTF heater will need to operate approximately 50 hours per year to keep the HTF from freezing.

2.3.3 Power Blocks

The power blocks, including the steam cycle, HTF system and thermal storage system, are located at the center of each solar field. The electrical and local control buildings, workshop buildings, electrical equipment buildings, and water treatment facilities will be located within the power blocks. A list of components contained within each power block, and their general location are shown in Figure 2-6. Major components specific to the power block are briefly described in the following section.

2.3.3.1 Solar Steam Generator System

The solar steam generator (SSG) system transfers heat from the HTF to the feed water (refer to Figure 2-5). The steam generated in the SSG is piped to a Rankine-cycle reheat steam turbine. Heat exchangers are included as part of the SSG system to preheat and boil the condensate, superheat the steam, reheat the steam, which is then sent to the STG.

The steam expands through the STG turbine blades to drive the steam turbine that, in turn, drives the generator, which converts mechanical energy to electrical energy. The Project's STG is expected to be a three-stage casing type with high-pressure, intermediate-pressure, and low-pressure steam sections. The STG is equipped with accessories required to provide efficient,

safe, and reliable operation. Major components include steam stop and control valves, a gland seal system, lubricating and jacking oil systems, thermal insulation, and control instrumentation.

The SSG system and STG will be located outdoors and supported on reinforced, concrete mat foundations. The STG foundation will include a reinforced concrete pedestal.

2.3.3.2 Power Block Heat Transfer Fluid System

In addition to the HTF piping in the solar field, the HTF system within the power block includes three elements: (1) the HTF heater, (2) the HTF expansion and overflow vessels and (3) the HTF ullage system. To eliminate the problem of HTF freezing, an HTF heater will be installed and used to ensure system temperature stays above 54 °F whenever the unit is off-line. An expansion vessel is required to accommodate the volumetric change that occurs when heating the HTF to the operating temperature.

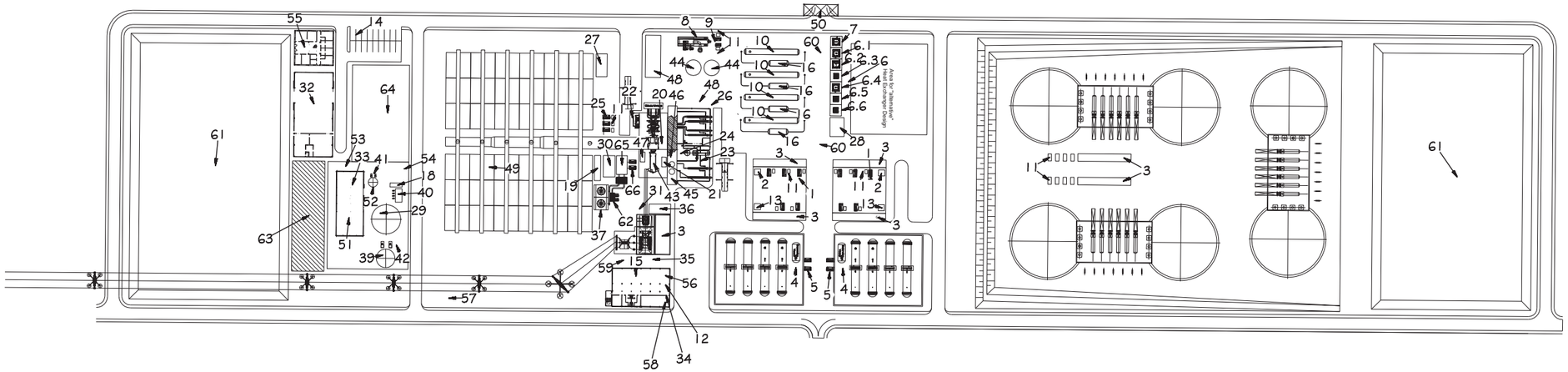
During plant operation, the HTF will degrade into components of high and low boilers (substances with high and low boiling points). The low boilers are removed from the process through the ullage system. The HTF is removed from the HTF surge tank and flashed, leaving behind high boilers and residual HTF. The flashed vapors are condensed and collected in the ullage system.

Leak detection of HTF will be accomplished in various ways. Visual inspection throughout the solar field on a daily basis will detect small leaks occurring at ball joints or other connections. Such leaks can be corrected via minor repairs or repacking of joints and valves. The configuration of the looped system, allowing different sections of the loops to be isolated, will facilitate the repair of small leaks. Since larger leaks are of a greater concern, detection of large leaks is being proposed by using remote pressure sensing equipment and remote operating valves to allow for isolation of large areas of the loops in the solar field. Details of the design will be developed in the design detail process.

2.3.3.3 Thermal Energy Storage

Each plant will include thermal storage, consisting of three dual, two-tank molten salt systems, sufficient to support approximately 4.5 full load-equivalent hours of electric energy after sundown and on cloudy days. The thermal energy storage system contains hot and cold storage tanks connected via 2 parallel trains of 6 oil-to-salt heat exchangers in series. For charging the storage, the salt is heated up to approximately 726.8 °F (386 °C), and for discharging it is cooled down again to approximately 557.6 °F (292 °C).

The salt freezes at approximately 429.8 °F (221 °C). Freezing of the salt must be avoided to prevent damage of components. The freeze protection system, which uses the hot HTF, keeps the salt at a minimum temperature of 500 °F (260 °C). To avoid freezing of the salt in non-working periods, the heat exchangers are equipped with electrical heat tracing.



POWER BLOCK DETAIL
SCALE 1"=100'

1. HTF MAIN PUMPS
2. HTF PUMPS SEAL OIL UNIT
3. SWITCH YARD
4. OVERFLOW VESSEL AND EXPANSION VESSEL
5. OVERFLOW RETURN PUMPS
6. ULLAGE COOLERS AND VESSEL
   - 6.1 HTF STORAGE TANK
   - 6.2 COLLECTING TANK
   - 6.3 RECLAMATION FLASH VESSEL
   - 6.4 RECLAMATION DRAIN VESSEL
   - 6.5 ULLAGE VESSEL 1
   - 6.6 ULLAGE VESSEL 2
7. NITROGEN SYSTEM
8. HTF HEATER
9. FREEZE PROTECTION PUMPS
10. STEAM GENERATORS
11. VARIABLE FREQUENCY DRIVE SYSTEM
12. WEATHER STATION
13. HTF PUMPS LUBE OIL UNIT
14. PARKING
15. BALANCE OF PLANT ELECTRICAL
16. REHEATERS
17. EXCITATION TRANSFORMER
18. WATER TREATMENT MCCS
19. MCC COOLING TOWER AREA
20. STEAM TURBINE
21. GLAND STEAM CONDENSER
22. LUBE OIL CONSOLE
23. DEAERATOR
24. FEEDWATER PUMPS
25. CONDENSATE PUMPS
26. LP/HP PRE-HEATERS
27. VACUUM SYSTEM
28. DIRTY WASTE WATER SUMP, OIL WATER SEPARATOR
29. RAW WATER TANK
30. COMPRESSED AIR SYSTEM
31. GENERATOR CIRCUIT BREAKER
32. WAREHOUSE
33. CHEMICAL INJECTION SKID
34. MAIN AUXILIARY TRANSFORMERS
35. GENERATOR STEP-UP TRANSFORMERS
36. EMERGENCY DIESEL GENERATOR
37. COOLING TOWER
38. FREE FOR USE
39. FIRE AND SERVICE WATER TANK
40. SERVICE WATER PUMPS
41. DEMINERALIZED WATER PUMPS
42. FIRE PROTECTION PUMPS
43. GENERATOR
44. BLOWDOWN TANKS
45. TURBINE DRAINS TANK
46. CONDENSATE TANK
47. STG PEECC
48. AUXILIARY BOILER
49. AIR COOLED CONDENSER
50. HTF PIPING CONNECTION TO SOLAR FIELD
51. SAMPLE PANEL & LAB BUILDING
52. DEMINERALIZED WATER TANK
53. CHEMICAL FEED CANOPY
54. WATER TREATMENT AREA
55. ADMINISTRATION BUILDING
56. CONTROL BUILDING
57. HIGH VOLTAGE LINE
58. SUS TRANSFORMER & 480 V BUS
59. TAKE OFF TOWER
60. PIPE RACK
61. RECYCLE BASIN
62. AUXILIARY COOLING WATER PUMPS
63. SEPTIC SYSTEM FIELD
64. Waste Water Tredment AREAWASTE WATER TREATMENT AREA
65. CLOSED COOLING WATER HEAT EXCHANGERS
66. CLOSED COOLING WATER PUMPS
67. FREE FOR USE
68. FREE FOR USE
69. FREE FOR USE
70. FREE FOR USE

N

0 100 200
SCALE – 1" = 100' FEET

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

SOLAR MILLENNIUM, LLC.

AMARGOSA FARM ROAD SOLAR PROJECT

FIGURE 2-6 DRY COOLING - POWER BLOCK DETAIL

DATE: 01-21-10
DRAFTER: NL
DESIGNER: NL
CHECKED: BDP

PROJECT NO.
SML0801.000

FIG. 2-6
SHEET 1 OF 1

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2.3.3.4 Cooling Systems

The proposed Project will utilize a dry-cooling system for heat rejection from the steam cycle consisting of a forced draft air-cooled condenser. In the dry-cooled alternative, the auxiliary cooling water system uses a small wet-cooling tower to cool plant auxiliary equipment, including the STG lubrication oil cooler, the STG cooler, steam cycle sample coolers, and large pumps. The water picks up heat from the various equipment items being cooled and *rejects* the heat to the cooling tower. This auxiliary cooling system will allow critical equipment such as the generator and HTF pumps to operate cooler and at their design ratings during hot summer months when the Project's power output is most valuable. An average of 130,000 gallons of water per day (108 acre-feet per year [afy]) will be consumed by the auxiliary cooling water system; the maximum rate of consumption is 197,500 gallons per day in summer. In the wet-cooled alternative, the auxiliary cooling water system circulates cooling water from the main cooling tower.

2.3.3.5 Buildings within the Power Block

The electrical and local control buildings, workshop buildings, and electrical equipment buildings will be located within the power blocks. All buildings will be of pre-engineered metal frame construction and assembled on site. Accessibility to buildings will be in full compliance with applicable codes and standards including the Americans with Disabilities Act.

Other plant site buildings will include the water treatment building, as well as a number of pre-engineered enclosures for mechanical and electrical equipment. Building columns will be supported on reinforced concrete mat foundations or individual spread footings and the structures will rest on reinforced concrete slabs. The total footprint area of the buildings in each power block is approximately 31,200 square feet.

2.3.4 Electrical System

The Project electrical components consist of the solar field electrical systems, the electrical system within the power blocks, and the Project switchyard. Transmission of power from the proposed Project will be "wheeled" through Valley Electric Association's (Valley Electric) proposed upgraded and existing lines. The proposed point of interconnection will be to a new switchyard to be constructed by Valley Electric near Amargosa Farm Road and Power Line Road adjacent to the power plant. Valley Electric will upgrade the existing distribution and transmission right-of-way that exist between the proposed Project switchyard and the planned Johnnie substation, by adding a new 230 kilovolt (kV) circuit. Valley Electric is responsible for upgrading its transmission system and is preparing a separate Environmental Assessment for that action.

2.3.4.1 Electrical Generation

Roughly 10 percent of the STG output would be used on site for plant auxiliary loads such as motors, heaters, control systems, and general facility loads including lighting and heating, ventilation, and air conditioning. Some of the power needed for on-site uses would be converted from alternating current (AC) to direct current (DC) for power plant control systems and emergency backup systems. Power would be generated by the STG (size and generation voltage is dependent on the final generator selection) and stepped up by a fan-cooled generator step-up transformer.

The steam turbine-generators would electrically connect to a 230kV on-site switchyard. The steam-turbine-generators generate electricity at 18kV. This voltage would be increased ("stepped-up") in the switchyard to 230kV via a generator step-up transformer. The generator step-up transformer would rest on a concrete pad with a perimeter berm designed to contain the transformer insulating oil in the event of a leak or spill.

The plant site switchyard would be located in the southeast corner of the Project site and would require an overhead steel-reinforced, aluminum conductor unit tie line for the connection to each unit's generator step-up transformer. The switchyard would consist of 230kV switchyard circuit breakers with 230kV disconnect switches on each side of the breaker for breaker maintenance.

The switchyard ground grid will be connected to the generation plant ground grid and will consist of copper conductor throughout the yard with ground rods installed around the perimeter and near major equipment. A layer of aggregate will be installed above grade to increase contact resistance within fenced switchyard area.

2.3.4.2 Direct Current Power Supply System

An uninterruptible power system will be provided in each unit. The power system will service emergency lighting, the DCS, electrical breakers, and relays. The DC power system will serve as a temporary bridge to the more robust emergency diesel AC power supply in the event external power is suddenly lost.

2.3.4.3 Essential Service Alternating Current System

A 120-volt essential service AC power distribution system serves critical equipment loads, lighting and alarms, and loads that protect equipment from potential damage in the event of sudden loss of station service. This system is served through an inverter that receives power from the DC power supply system.

2.3.5 Fuel Supply and Use

The auxiliary boiler and HTF heaters will be fueled by propane. Propane will be delivered to the plant site via truck from a local distributor and stored in 18,000-gallon aboveground tanks (one in each power block). The estimated propane usage for the auxiliary boiler per unit for normal

operation is approximately 9 MMBtu/hr overnight and approximately 34 MMBtu/hr for 30 minutes during startup each morning. The estimated maximum propane usage for the HTF heater is an additional 41 MMBtu/hr per unit is for approximately 50 hours per year during the winter.

2.3.6 Water Supply and Use

Under the Proposed Action, the Project would use dry-cooled technology. Water use in a dry-cooled plant would include water for solar collector mirror washing, makeup for the SSG feedwater, dust control, water for cooling plant auxiliary equipment, potable water and fire protection.

2.3.6.1 Water Requirements

The estimated operational water requirements for the power plant are presented in Table 2-3. The average total annual water usage under the dry-cooled option is estimated to be approximately 400 afy, which corresponds to an average flow rate of about 248 gallons per minute. Usage rates will vary during the year and would be higher in the summer months when the peak maximum flow rate could be as much as about 50 percent higher for the ancillary equipment heat rejection process. Equipment sizing would be consistent with peak daily rates to ensure adequate design margin.

Table 2-3 Summary of Operational Water Usage

Rate of Use	Annual Average (afy) Dry-Cooled	Annual Average (afy) Wet-Cooled
Power Cycle Heat Rejection	0	4,409
Power Cycle Makeup Water *	101	101
Mirror Wash Water	200	149
Domestic Potable Water	9	9
Dust Suppression Water	45	33
Ancillary Equipment Heat Rejection	146	0
Totals (rounded)	400	4,600

* Power cycle makeup will be recycled and is not included in the consumptive use total (see Section 2.5.6.3)

2.3.6.2 Water Source

The water needs for the proposed Project will be met by one of two options: 1) leasing and conveying groundwater from three existing wells located on private land southwest of the Project site; or 2) purchasing existing water rights from the three wells, and moving the point of diversion to the power block areas.

The 3 wells under consideration have associated water rights totaling 1,323 afy. It is expected that the 3 wells will adequately serve the proposed Project (under the dry-cooled alternative) on a rotating basis without exceeding their annual pumping average. It is anticipated that 2 wells will be the primary source of water, while the third well would provide redundancy, an inherent backup water supply in the event of outages or maintenance of the other wells. Location and annual duty associated with each well is listed in Table 2-4.

Table 2-4 Project Wells

Application No.	Certificate No.	Location	Annual Duty (afy)[1]	6-year Average Pumpage (afy)[1]
15702	6444	NE ¼ SE ¼ Sec 14, T16S, R48E	175.00	145.83
15893	5717	NE ¼ NE ¼ Sec 23, T16S, R48E	545.38	288.18
43873	12460	SW ¼ NW ¼ Sec 24, T16S, R48E	603.00	502.50
		Totals	**1,323.38**	**936.51**

[1]One acre-foot equals 325,851 gallons
Source: Nevada Division of Water Resources (NDWR) 2009a

For the lease option, a new pipeline will be constructed from existing points of diversion to the project site. Pipeline diameters will vary by need and would be sized upon final engineering design. It is estimated pipeline sizes will range from 8 to 14 inches, depending upon the required flows. The pipeline route would be on private land adjacent to, and within the proposed right-of-way. A main waterline line will be constructed from existing point of diversion (certificate 5717), located approximately 50 feet southwest of the northeast section corner of Section 23, Township 16 South, Range 48 East. The line will depart the point of diversion (across a private right-of-way) and head in a northeasterly direction approximately 100 feet to fall within the proposed project right-of-way; it will then head in a northerly direction to the project power blocks, assembly hall and office building. Redundant waterlines from points of diversion (certificate nos. 12460 and 6444) will be constructed and tied to the main line previously described. Applications will be filed for a change in place of use and manner of use through the NDWR for a portion of the certificated water rights, totaling 400 afy.

For the purchase option, a portion of the certificated water rights (totaling 400 afy) would be moved to new points of diversion. The new points of diversion would be located at the north end of each power block. The Proponent would apply for a change in the point of diversion, place of use, and manner of use through the Nevada Division of Water Resources (NDWR).

2.3.6.3 Water Treatment

For uses requiring treated water, the groundwater will first be treated by reverse osmosis (RO) or an electrodialysis reversal (EDR) process in a single treatment unit prior to being directed to a water storage tank. Up to three covered water tanks would be constructed on site. These include

a RO concentrate/dust control storage tank totaling 750,000 to 1.1 million gallons of capacity, and two treated water storage tanks, one at each power block, each totaling 250,000 to 600,000 gallons. Each tank will be a vertical, cylindrical, field-erected steel tank supported on foundations consisting of either a reinforced concrete mat or a reinforced concrete ring wall with an interior bearing layer of compacted sand supporting the tank bottom.

Water used for power cycle feedwater makeup, mirror washing, ancillary equipment heat rejection, and domestic uses would require treatment for reduction of total dissolved solids (TDS). This type of treatment process is known as demineralization, and can be accomplished by either distillation processes (evaporation/condensation) or membrane processes such as RO or EDR. Since TDS concentrations are known to be high in Amargosa Valley, it is unlikely that thermal processes would be cost effective in this area. Accordingly, only membrane processes are considered here. Since RO and EDR produce similar product water quality and waste streams, further discussion here will reference only RO for simplicity. Selection of the process to be used at the Project would be made during the final design process.

Membrane demineralization processes split the feed stream into two streams: (1) a product water stream (permeate) with reduced salinity and (2) a concentrate stream containing the majority of the salts that were in the feed stream. Desalination processes are usually designed to operate with the highest safe recovery (recovery is the fraction of feed water recovered as permeate) in order to minimize water loss, since the concentrate would normally be considered a waste stream. In this case, the highest safe recovery is 92 percent.

In order to provide the demineralized water quality needed for power cycle makeup, it would be necessary to use ion exchange demineralization as a final treatment step after RO. Ion exchange demineralization can be done using either permanently installed equipment or portable demineralizers. Permanently installed equipment requires regeneration on site, which requires storage and disposal of significant quantities of sulfuric acid and sodium hydroxide (caustic). Alternatively, portable demineralizers are taken off-site for regeneration at the supplier's facility, so no on-site storage of chemicals and disposal of regeneration wastes is required. Off-site regeneration is proposed for the Project. This would eliminate the need to store regeneration chemicals on site and minimize on-site production of hazardous wastes. These demineralizers would be provided as forklift-moveable fiberglass bottles that would be traded out when exhausted and returned to the supplier for regeneration. Demineralization systems would be installed at each power block to minimize piping and provide the best water quality.

The steam purity specification is based on the VGB *Guidelines for Feedwater, Boiler Water, and Steam Quality for Power Plants/Industrial Plants* R450Le, issued in 2004. It is anticipated that all of the power-cycle make-up water will be recycled and reused as feed to the RO system. This would reduce the salinity of the RO feed and improve the RO recovery.

Because of the very low TDS of the makeup to the ancillary equipment heat rejection cooling tower, it is expected that blowdown would not be required. Rather, drift (windblown mist) would provide the necessary salt removal. If blowdown is required, it would be recycled to the RO system. It may be more advantageous to recycle the power cycle makeup water to the ion exchange demineralizer rather than to the RO. This modification will be evaluated during final design.

If used as a potable water source, water from the site groundwater wells may require treatment to meet public health requirements for domestic potable water supplies. The Proponent would use a desalination process for water treatment. Following desalination, the water would require addition of chlorine to prevent growth of pathogenic organisms. A Public Water System Permit for a non-community water system would be obtained from the NDEP – Bureau of Safe Drinking Water (NRS 445, NAC 445A, 450 through 445A.6731).

2.3.6.4 Water Needs during Construction

Water needs for construction related activities include:

- Dust control for areas experiencing construction work as well as mobilization and demobilization
- Dust control for roadways
- Water for grading activities associated with both cut and fill work
- Water for soil compaction in the utility and infrastructure trenches
- Water for soil compaction of the site grading activities
- Water for soil stockpile sites
- Water for the various building pads
- Water for concrete pours on site

The predominant use of water during construction will be for grading activities, which will occur at a steady rate of work each month. The grading schedule for the site would be spread to cover the total construction period. This will mean that water use will be steady and without definable peaks.

Project construction is expected to occur over a total of 39 months. Average construction water use at the site is estimated to be about 752,000 gallons (about 2.3 afy) per working day. Total construction water use for the duration of the Project is estimated to be about 600 afy (1,950 over the 39 month construction period). Construction water will be sourced from wells within close proximity to the site and piped to the site for use by the contractor. Potable water during construction will be brought to the site in trucks and held in day tanks. Temporary easements on private land will be in place for the duration of the construction period for access to water wells.

2.3.6.5 Water Needs during Operations

Water needs during operation for both the wet- and dry-cooled alternatives are summarized in Table 2-3, Summary of Operational Water Use. Cooling constitutes the most significant water use ranging from 4,409 afy for a wet-cooled plant to 146 afy for the dry-cooled alternative. Mirror wash constitutes the second largest water use (200 afy). To facilitate dust and contaminant removal, water from the primary desalination process, RO water, would be used to spray clean the solar collectors on a weekly or as-needed basis, determined by the reflectivity monitoring program. This mirror washing operation is done at night and involves a water truck spraying demineralized water on the mirrors in a drive-by fashion. It is expected that the mirrors will be washed weekly in winter and twice weekly from mid- spring through mid-fall. The mirrors are angled down for washing therefore water does not accumulate on the mirrors. Wash

water falls from the mirrors to the ground and, due to the small volume, soaks in with no appreciable runoff. Remaining rinse water from the washing operation is expected to evaporate on the mirror surface. Power cycle makeup water (101 afy) is water used to make up for leakages and operational cleanliness of the power cycle. This requirement is similar for both the wet- and dry-cooled options. Dust suppression (45 afy) and domestic potable water use (9 afy) are also similar for both the wet-cooled and dry-cooled options.

2.3.7 Waste Generation and Management

Project wastes would be comprised of non-hazardous wastes including solids and liquids and lesser amounts of hazardous wastes and universal wastes. The non-hazardous solid waste would primarily consist of construction and office wastes, as well as liquid and solid wastes from the water treatment system. In the case of the wet-cooled alternative, this waste stream would also include the mineral deposits that concentrate in the evaporative cooling water ponds. The non-hazardous solid wastes would be trucked to the nearest landfill, which is a Class I landfill located in Pahrump with no limit to the amount of daily waste. Alternate disposal location is Las Vegas if a Class II or Class III landfill is required. Non-hazardous liquid wastes would consist primarily of domestic sewage. To manage the non recyclable non-hazardous domestic sewage wastes, a septic tank and leach field would be installed. Process waste water streams include RO system reject water, boiler blowdown, and auxiliary cooling tower blowdown. Boiler blowdown and auxiliary cooling tower blowdown will be recycled to the RO feed water system. All RO system reject water will be used for dust suppression.

2.3.7.1 Hazardous Materials Management

Hazardous materials to be used during construction will include gasoline, diesel fuel, oil, lubricants, paint, and paint-related products (e.g., primer, paint thinner, other solvents). All hazardous materials used during construction and operation would be stored on site in storage tanks/vessels/containers that are specifically designed for the characteristics of the materials to be stored.

Secondary containment structures will be provided around any oil-filled transformers located outdoors, STG lube oil tanks, HTF overflow and expansion vessels and any other oil containing tanks over 55 gallons without double walls or vendor supplied secondary containment. The containment will be sized to contain 125 percent of the fluid in the transformer or vessels with appropriate freeboard required per code. Additional equipment (such as HTF pumps, feedwater pumps, etc.) will be provided with 6-inch-tall curbs as appropriate.

Both construction and operation-phase hazardous waste will be recycled and reused to the extent possible.

Site-specific, safety-related plans and programs would be developed and implemented to ensure safe handling, storage, and use of hazardous materials (i.e., Hazardous Material Business Plan). Plant personnel would be supplied with appropriate personal protective equipment (PPE) and would be properly trained in the use of PPE and the handling, use, and cleanup of hazardous

materials used at the facility, as well as procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on site.

2.3.7.2 Wastewater

The Project will produce two primary wastewater streams:

- Non-reusable sanitary wastewater produced from administrative centers and operator stations.

- Reusable streams including: blowdown from the small ancillary equipment cooling tower for the ancillary equipment heat rejection system; RO reject water, and boiler blowdown.

The amount of non-reusable sanitary wastewater produced is dependent upon the number of people using the facilities, how the water is used (e.g. toilets, showers, kitchen sinks, etc.), and the types of facilities provided (e.g. port-a-johns, low-flush toilets, potable drinking water, etc.). It is anticipated that up to 9 afy will be required for potable water use.

The power generation cycle will not produce cooling tower blowdown because the plant will be dry-cooled. A small auxiliary cooling tower will generate a small amount of blowdown that will be reused on site.

2.3.7.3 Wastewater Treatment

Sanitary wastes produced during construction would be held in chemical toilets and transported off-site for disposal by a commercial chemical toilet service. Any other wastewater produced during construction such as equipment rinse water would be collected by the construction contractor in Baker tanks and transported off-site for disposal in a manner consistent with applicable regulatory requirements.

During operations, sanitary wastes will be collected for treatment in septic tanks and disposed via leach fields located at the power block as well as at the administration and warehouse areas. Smaller septic systems will be provided for the control room buildings to receive sanitary wastes at those locations. Based on the current estimate of 180 employees on a 24-hour, 7 day per week work schedule, a total leach field area of approximately 16,500 square feet would be required. It may be economical and expedient to provide permanent, portable, chemical toilets at remote areas of the operational Project site.

At this time, the leach field is anticipated to be sited adjacent to the bioremediation field. However, the final location will be determined following additional engineering design. The Proponent will coordinate the development of the leach field and bioremediation facility with NDEP as part of their permitting and approval process with that agency.

2.3.8 Bioremediation Unit

The HTF for the solar fields will be diphenyl/biphenyl oxide. Dowtherm A and Solutia VP-1 are commercial products that have been used in concentrated solar trough plants to date. The diphenyl/biphenyl oxide mixture is not classified as a hazardous material by the USDOT, nor is it listed under EPA CERCLA regulations. However, this material, when discarded, may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic.

While the collector design has advanced to an excellent level of performance and reliability, occasional small spills of HTF do occur, primarily due to equipment failures. Spill management procedures would be implemented to report, contain and clean up any accidental spills. If a line worker or other staff observes a spill or release, the system operators in the power block will be notified and the affected collector loop shut down. An appropriately equipped crew will make any necessary equipment repairs and remove any hazardous wastes to an on-site bioremediation facility that utilizes indigenous bacteria to digest the hydrocarbon contamination.

The two solar fields would share the same bioremediation unit to bio-remediate or land farm soil contaminated from releases of HTF. Each bioremediation facility is expected to comprise an area of about 400 feet by 800 feet (7 acres). The bioremediation facility would utilize naturally occurring bacteria to metabolize hydrocarbons contained in non-hazardous HTF contaminated soil. A combination of nutrients, water, and aeration facilitates the bacterial activity where microbes restore contaminated soil within 2 to 4 months.

2.3.9 Fire Protection

Fire protection systems will be provided to limit personnel injury, property loss, and downtime in the event of a fire. On-site fire protection, designed in conformance with the International Fire Code 2006 edition with Nevada State Fire Marshal Amendments, would be provided for the Project. The system will include a fire protection water system and portable fire extinguishers.

Separate fire flow storage tanks will be sited within each of the two power blocks and an additional storage tank may be required for the Assembly Hall depending upon the final location of the structure. Firewater will be sourced from the three wells to be used for the Project, and will be pumped to the site and stored in tanks for fire suppression. On-site fire pumps will be required to deliver water to the fire protection piping network for each of the buildings located within the power blocks.

The piping network will be configured in a loop so that a piping failure can be isolated with shutoff valves without interrupting water supply to other areas in the loop. Fire hydrants will be placed at intervals throughout the plant site that would be supplied with water from the supply loop. The water supply loop will also supply firewater to a sprinkler deluge system at each unit transformer, HTF expansion tank and circulating pump area and sprinkler systems at the STG and in the administration building.

Fire protection for the solar field will be provided by zoned isolation of the HTF lines in the unlikely event of a rupture that results in a fire. Since vegetation and other combustible materials will not be present in the solar field area, the HTF would be allowed to self extinguish.

In the event additional fire support is needed, the Amargosa Valley Volunteer Fire Department would be contacted. The Amargosa Valley Volunteer Fire Department Station is located at 851 E. Amargosa Farm Road, which is approximately 1.3 miles from the southeast corner of the solar field. If needed, mutual aid would be provided by the Pahrump and Mercury fire departments. Ongoing discussions with Nye County may further define the services provided by the Amargosa Valley Volunteer Fire Department.

A Construction Fire Protection and Prevention Plan will be developed and followed throughout all phases of construction. The permanent facility fire protection system will be put into use during construction as soon as is practicable. Prior to the availability of this system, fire extinguishers and other portable fire-fighting equipment will be available on site. All equipment will be Occupational Safety and Health Administration (OSHA) compliant. Locations of portable firefighting equipment may include portable office spaces, welding areas, flammable chemical areas, and vehicles and other mobile equipment.

2.3.10 Telecommunications and Telemetry

The Project will have telecommunications service from providers who serve the Amargosa Valley area. Voice and data communications will be supported by a fiber optic system. This will be augmented with wireless telecom equipment, particularly to support communication with Project staff dispersed throughout the large Project site.

With respect to telemetry, the Project will utilize electronic systems to control equipment and facilities operations over a large site. Detailed information on Project use of the electronic spectrum has not yet been developed at the current stage of the Project engineering design process.

2.3.11 Lighting System

Project operation would require on-site nighttime lighting for safety and security. To reduce off-site lighting effects, lighting at the facility would be restricted to areas required for safety, security, and operation. Exterior lights would be hooded, and lights would be directed on-site so that light or glare would be minimized in deference to the “dark skies” initiatives that strive to protect views of night skies.

Low-pressure sodium lamps and fixtures of a non-glare type would be specified. Switched lighting would be provided for areas where continuous lighting was not required for normal operation, safety, or security; this would allow these areas to remain unlit most of the time, thereby minimizing the amount of lighting potentially visible off-site. AC lighting will be the primary form of illumination, but DC lighting will be included for activities or emergency egress required during an outage of the plant’s AC system.

2.3.12 Roads, Fencing, and Security

The Project site has existing access from Amargosa Farm Road. However, it is anticipated that construction traffic, including equipment and workers, will access the Project site from an alternative access road. Construction of this access road may be performed by Nye County and will require additional consultation with the BLM and NDOT.

Alternative access routes to the Project site are shown on Figure 1-2 and include access:

- From US 95, south along an extension of the T&T Road to the Project site; approximately 5 miles in length
- From US 95, southerly along Valley View Boulevard to Amargosa Farm Road. The proposed Project right-of-way is 0.5 miles east of the intersection of Valley View Boulevard and Amargosa Farm Road.
- From NV 373, westerly along Anvil Road, approximately 4 miles to Powerline Road, thence north along Powerline Road, 1 mile to the proposed Project right-of-way.

Amargosa Farm Road is an existing public roadway maintained by Nye County Public Works. The roadway consists of 24 feet of asphalt/concrete pavement and roadside ditches on both sides. Amargosa Farm Road would be realigned, either 250 feet or 0.25 miles south of the existing roadway, based on final engineering design. The proposed roadway alignment will be coordinated with Nye County Public Works and be reconstructed in conformance with current standards.

The locations of the principal site entry gates for both the construction and the commercial operating period will be evaluated in consultation with the BLM, NDOT and Nye County Public Works to ensure ingress and egress from the site does not have adverse impacts on existing traffic flow patterns.

Only a small portion of the overall plant site will be paved; primarily the site access road, the service roads to the power blocks, and portions of the power block (paved parking lot and roads encircling the STG and SSG areas). The remaining portions of the power block will be gravel surfaced. The solar field will remain unpaved and without a gravel surface in order to prevent rock damage from mirror wash vehicle traffic; an approved dust-suppression coating will be used on the dirt roadways within and around the solar field. Roads and parking areas located within the power block area and adjacent to the administration building and warehouse will be paved with asphalt.

The solar field and support facilities perimeter will be secured with a combination of chain-link and wind fencing. Chain-link, metal-fabric security fencing, 8-feet tall, with 1-foot barbed wire (or razor wire) on top will be installed along the north and south sides of the facilities. Thirty-foot-tall wind fencing comprised of A-frames and wire mesh will be installed along the east and west sides of each solar field. The wind fence would be designed to serve two purposes; protect the solar field from blowing dust and sand, and to partially screen the solar facilities from surrounding properties. Controlled access gates will be located at the site entrance.

2.3.13 Temporary Construction Workspace, Yards, Staging Areas

An assembly hall will be built for storage of equipment and for field fabrication facilities. This building, located south of the Amargosa Road realignment, may become permanent depending on the need for additional permanent warehouses for spare parts or maintenance work. Indoor storage space will be required only for weather sensitive items such as control/electrical panels, or small parts that could easily be misplaced. Some space for material requiring temperature and humidity control will be provided. Other items will be stored outdoors on raised platforms with proper covers or temporary shelters. Construction-area lighting will be provided at the warehouse locations. At the areas designated on the site laydown plan, construction subcontractors will provide their own warehousing facilities needed for their materials.

In addition to the permanent plant roads and parking, construction roads and parking will be required to provide access to construction facilities and the laydown area. Construction parking space will be provided near the construction office complex. These temporary roads will be all-weather, gravel surfaced; have sufficient width; and be effectively located to accommodate high-efficiency construction traffic. The parking area will have barriers to control parking patterns. The construction parking area will accommodate approximately 400 vehicles.

2.3.14 Site Drainage and Earthwork

The existing topographic conditions of the Project site show an average slope of approximately 1 foot in 200 feet (0.5 percent) and generally sloping in a southwesterly direction. The site consists of desert shrub and is traversed by numerous defined, intermittent, and braided washes within the Fortymile Wash watershed. The Fortymile Wash consists of an approximate 330-square-mile drainage area measured to the southern property line of the Project site. The section of the Fortymile Wash impacting the site is considered alluvial, based on site field investigation and review of aerial photography. The apex of the Fortymile Wash is clearly identifiable approximately 0.5 mile north of US 95. Under existing conditions, three primary discharge locations along the southern property boundary are apparent. It is the objective of the Project's stormwater management plan to perpetuate discharge at these three historic locations.

The site will be graded generally following the existing contours of the site in order to minimize the amount of disturbance and to allow a balanced distribution of material. Flood protection of the property from off-site flows will be provided by means of a continuous concrete lined channel around the northern and western perimeter of the site. The channel will be designed to effectively intercept the 100-year storm event off-site runoff and convey the concentrated flow to the southwest corner of the property. The southwest corner of the property has been identified as one of the historic discharge locations of the Fortymile Wash. The channel will discharge within the property limits and energy dissipation facilities will be provided in order to disperse the concentrated flow back to a shallow sheet flow condition prior to leaving the property boundary.

Additionally, a concrete lined channel is proposed along the eastern side of the solar field, inside the fence line, in order to intercept and collect flows impacting the site from the east (see Figures 2-1 through 2-4). Similar to the Fortymile Wash channel, the concentrated flow will be released on the property in its historic location and an energy dissipation facility will be provided in order

to return the flow to a shallow sheet flow condition prior to leaving the property. Perimeter channels are recommended to be concrete lined due to the high velocity potential and for maintenance reasons. Offsite flows will be intercepted and conveyed around the site to ensure no direct contact with on-site stormwater runoff.

Due to the size of the solar field area, the site itself has potential to generate large storm flows during a rain event. For this reason, stormwater control facilities will be constructed to protect on-site facilities, and to convey stormwater runoff to historic discharge locations in both quantity and manner of flow.

The four primary (major) onsite channels, traversing the site north to south, provide 100-year event stormwater runoff interception from four equal divisions of the entire project site. The two power block areas are considered to contain the most sensitive equipment on the site and are therefore each located along one of the primary channels; thus achieving flood protection during a 100-year storm event. The stormwater runoff generated between the primary channels will be collected in a series of swales and small channels that will direct the flow to the appropriate primary channel.

All minor channels within each section will be designed to intercept and convey the 25-year storm event. Stormwater runoff in areas between the primary channels and in excess of the 25-year event will consist of sheet flow (shallow depth, low velocity) below the solar panel systems; and eventually be intercepted by an appropriate primary channel prior to impacting a power block area. This concept was selected in order to reduce costs for on-site drainage facilities, while still providing desired flood protection.

All primary channels are recommended as concrete lined. Concrete lined channels have been proposed for the following reasons: 1) to achieve channel reliability and integrity; 2) to provide a means for routine maintenance and sediment deposition removal; and 3) to achieve necessary channel width in conformance with the site design space limitations. Various culvert facilities will be utilized to convey storm flow below essential on-site and off-site roads for access and movement around the site.

In addition to conveyance facilities, an on-site detention basin is considered necessary in order to limit post-development flows to pre-development limits. Onsite storm flows will pass through the detention basin prior to off-site discharge, providing a facility for suspended particles to settle.

In order to reduce impacts from off-site stormwater runoff, a regional flood control alternative was presented to the BLM and Nye County staff. The alternative would provide a regional off-site detention basin at the apex of the Fortymile Wash located north of US 95 and would effectively and considerably reduce existing condition peak storm flow downstream of US 95. Reducing off-site peak flows impacting the site allow for reduction in size of perimeter flood control facilities necessary for protection of the Project site. All properties downstream of the detention basin would benefit from this approach. This alternative is being evaluated by both BLM and Nye County staff.

The power blocks will generally drain by sheet flow or swales to the nearest detention basin. The basins will be designed to retain for a short duration prior to outfall to the nearest primary

channel. Oil and chemical storage areas within the power locks will have their own containment features.

The preliminary site grading plan is designed to be balanced; no import or export of soil is expected for general earthwork. When the geotechnical investigation report is available for the site, the grading plan will be adjusted to account for any loss in elevation that could occur. Engineered fill will be provided as required for equipment and structure foundations if recommended by the geotechnical report. Only soil material that has been approved by the BLM, in consultation with a licensed geotechnical engineer will be used for structural fill. Additionally, granular material may need to be imported for the use as road base and possible use below foundations. Grading of the site will commence at the beginning of the construction period and last over a period of approximately 24 months. Such an extended grading period will require less water on a daily basis for grading operations as well as for dust control over a smaller area. The total earth movement required is estimated to be approximately 9,345,000 cubic yards.

During construction and operation, a comprehensive system of management controls, including permanent and temporary site-specific Best Management Practices (BMP), to minimize stormwater contact with contaminants and sediment transport would be implemented. An NOI application and Stormwater Pollution Prevention Plan (SWPPP) in accordance with the State of Nevada, National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit NVR 100000 will be filed with the NDEP prior to the initiation of any construction activities. The SWPPP will utilize BMPs for the environmental control of stormwater discharges to off-site areas that may be attributed to Project activities. The SWPPP will contain a comprehensive procedure for inspecting and repairing BMPs. The management controls may include:

- Erosion and sediment control BMPs during construction activities such as silt fence, straw waddles, gravel bags, dust control, inlet protection, and sediment traps
- Employee training program
- Good housekeeping programs
- Preventive maintenance programs
- Structural BMPs:
    - Temporary containment during maintenance activities
    - Permanent erosion and sediment control BMPs such as detention/sediment basin, diversion berms, riprap stabilization, concrete lined channels, and energy dissipation devices
    - Permanent secondary containment structures at chemical storage and process areas
- Materials, equipment and vehicle management practices
- Spill prevention and response programs
- Inspection programs

2.3.15 Construction Schedule, Manpower, and Sequencing

Construction will be managed by Solar Millennium. Several dozen major and minor subcontractors will be hired to undertake the myriad of mechanical, civil and electrical construction tasks. Prior to mobilization for construction, a detailed construction plan will be

developed to define the construction supervisory and technical field organizations and staffing levels required for the Project. Major milestones of the planned construction schedule are as follows:

- Begin construction: fourth quarter 2010
- Unit #1 start of commercial operations: mid 2013
- Unit #2 start of commercial operations: by mid 2014

Project construction is expected to occur over a total of 39 months. The Proponent would phase construction so that the first power plant would be operational approximately 1 year before the second plant becomes operational. Project construction will require an average of 650 employees over the entire 39-month construction period, with manpower requirements peaking at approximately 1,300 workers in Month 17 of construction. The construction workforce will consist of a range of laborers, craftsmen, supervisory personnel, support personnel, and management personnel. Chapter 3.9 – Socioeconomics provides a breakdown of the construction workforce by skill over the entire construction period.

Temporary construction parking areas will be provided within the power plant site adjacent to the laydown area. The plant laydown area will be used throughout the build out of the two solar units. The construction sequence for plant construction includes the following general steps:

- Site Preparation: This includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features. Grading for the solar field, power block, and drainage channels will be completed during the first 24 months of the construction schedule. Pre-construction survey work will consist of staking/flagging right-of-way and site area boundaries, work areas (permanent and short term), cut and fill staking, access and roads, transmission structure centers, foundation structure staking, and desert tortoise/endangered plants offsets. Staking/flagging will be maintained until final cleanup or reclamation.

- Linears: This includes the site access road and telecommunication line. The site access road and telecommunication line will be constructed during the first 6 months of the construction schedule in conjunction with site-preparation activities.

- Foundations: This includes excavations for large equipment, footings for the solar field, and ancillary foundations in the power block.

- Major Equipment Installation: Once the foundations are complete, the larger equipment will be installed. The solar field components will be assembled in an on-site erection facility and installed on their foundations.

- Balance of Plant: With the major equipment in place, the remaining fieldwork will be piping, electrical, and smaller component installations.

- Testing and Commissioning: Testing of subsystems will be conducted as they are completed. Major equipment will be tested once all supporting subsystems are installed and tested.

2.3.16 Operations and Maintenance

While electrical power is to be generated only during daylight hours, the Project will be staffed 24 hours a day, 7 days per week. A total estimated workforce of 100 full-time employees will be needed to staff the first phase of the project (Unit #1). When the second of the 2 units comes online, the full-time staff will increase to 180. The operations workforce would consist of plant operators and maintenance technicians working 12-hour shifts, and administrative personnel working 8-hour shifts per day.

Maintenance activities during operations will include daily inspection of field components, condition assessment of critical equipment, and routine lubrication of equipment. Some specialized maintenance would be performed by the equipment provider or other specialist contractors. Long-term maintenance would be performed against a defined service and replacement schedule.

Mirror washing is done at night and involves a water truck spraying treated water on the mirrors in a drive-by fashion. It is expected that the mirrors will be washed weekly in winter and twice weekly from mid- spring through mid-fall.

Under normal circumstances, the plant switchyard would be controlled remotely, and routine inspections by personnel would occur on a monthly basis or as needed under emergency conditions. In addition, all of the switchyard structures will be inspected from the ground on an annual basis for corrosion, misalignment, and foundation condition. Ground inspection will include the inspection of hardware, insulator keys, and conductors. This inspection will also check conductors and fixtures for corrosion, breaks, broken insulators, and bad splices.

Road maintenance would be performed as needed. Paved roads would be swept, sealed, and/or overlaid as needed. Grading and drainage would be maintained for gravel and earthen roads.

2.3.17 Decommissioning

The lifespan of the proposed Project is expected to span at least 30 years. At the end of the Project's useful lifespan, the facilities will either be repowered or decommissioned. Due to the excellent solar resource at the Project site, repowering is a viable option. This may involve replacing the existing parabolic troughs with components that are more efficient, thereby extending the useful lifespan of the Project. Decommissioning will adhere to the requirements of appropriate governing authorities and will be in accordance with all applicable federal, state, and local permits, including any reclamation requirements BLM specifically adopts for utility-scale solar projects. For this particular site, the decommissioning process will involve steps to dismantle and remove equipment, stabilize soil and drainages, and regrade and reshape features as necessary. Consistent with BLM requirements, a detailed decommissioning plan would be developed in a manner that both protects public health and safety and is environmentally acceptable.

2.4 Wet-Cooled Alternative

Under the wet-cooled alternative, the Proponent would construct and operate two 242 MW solar thermal power plants and ancillary facilities. Construction and operation of a wet-cooled project would be similar to a dry-cooled plant. Plant components and layout are similar under both the wet- and dry-cooled alternatives; the primary differences being the amount of water used for plant operations, the need for cooling towers for heat rejection from the steam cycle (see section 2.5.3.4), and the need for evaporation ponds. Table 2-2 lists the plant components for both the wet- and dry-cooled alternatives.

Water use in a wet-cooled plant would include water needed for the cooling tower to cool the steam cycle; water for solar collector mirror washing; makeup for the SSG feedwater; dust control, potable water and fire protection. The average total annual water usage for the wet-cooled alternative is estimated to be approximately 4,600 afy. The estimated operational water requirements for a wet-cooled plant are presented in Table 2-3. Under the wet-cooled alternative, the 3 wells identified for use in under the dry-cooled alternative, would supply a portion of the water required for operations. However, additional water supplies would be required under the wet-cooled alternative. The source of this additional water would be dependent on the availability of other water rights available for lease or sale in the Amargosa Desert Hydrographic Basin.

The wet-cooling alternative has performance advantages over the dry-cooling alternative offering approximately 11 MW greater electrical output during peak summer ambient temperature conditions. The performance of the wet-cooled alternative is enhanced because wet-cooling relies primarily on evaporative cooling to remove heat from the circulating water. In contrast, a dry-cooled alternative uses convective heat transfer, which operates similar to a car's radiator. In the dry-cooled alternative, an air cooled condenser using a large array of fans that force air over finned tube heat exchangers cools the steam turbine-generator exhaust steam. The disadvantages of dry-cooling are higher capital costs, higher auxiliary operating power requirements and an overall lower plant performance, especially on hot days, when the peak power is needed most. A dry-cooled plant provides about 5 percent less electric energy on an annual basis than a wet-cooled plant, because of reduced performance on hot summer days. The electricity cost for a dry-cooled plant is approximately 6 to 9 percent higher than for a wet-cooled plant. Thus dry-cooling of a trough plant minimizes water use, but at a 6 to 9 percent cost penalty.

2.5 No Action Alternative

NEPA regulations require that EIS alternative analyses "include the alternative of no action" (40 CFR 1502.14[d]). The No Action alternative must be included in analysis according to CEQ regulations so that the EIS clearly evaluates the consequences between the alternative methods of developing the proposed Project and the option of no development. The No Action Alternative provides a useful baseline for comparison of the environmental effects of the other alternatives. For this analysis, no action means that the BLM would reject Solar Millennium's proposal and the right-of-way as requested would not be approved or authorized.

Because the Project facilities would not exist, potential adverse environmental effects would not occur. However, it is important to also note that any beneficial effects such as reduced fossil fuel use would also not occur.

2.5.1 Agency-Preferred Alternative

The BLM is awaiting public input before making a decision on a preferred alternative. The environmental consequences of the Proposed Action and Alternatives are summarized and compared in Table 2-5 below.

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
Air Quality and Climate – Sections 3.1 and 4.1		
Direct effects on air quality would occur from earthmoving activity during construction (fugitive dust, PM_{10} and $PM_{2.5}$) and tailpipe emissions from heavy construction equipment and worker vehicles (PM, NOx, SO_2, CO, and VOC). The Proponent would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures. Operation of the solar power plant would not result in increases of Potential for Significant Deterioration emission levels in the regional area. The facility is not considered a major stationary source with potential to cause significant air quality impacts. The Project's operation would not cause new violations of any NO_2, SO_2, $PM_{2.5}$ or CO ambient air quality standards.	Direct effects on air quality would occur from earthmoving activity during construction (fugitive dust, PM_{10} and $PM_{2.5}$) and tailpipe emissions from heavy construction equipment and worker vehicles (PM, NOx, SO_2, CO, and VOC). The Proponent would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures. Operation of the solar power plant would not result in increases of Potential for Significant Deterioration emission levels in the regional area. The facility is not considered a major stationary source with potential to cause significant air quality impacts. The Project's operation would not cause new violations of any NO_2, SO_2, $PM_{2.5}$ or CO ambient air quality standards.	Direct effects on air quality would occur from earthmoving activity during construction (fugitive dust, PM_{10} and $PM_{2.5}$) and tailpipe emissions from heavy construction equipment and worker vehicles (PM, NOx, SO_2, CO, and VOC). The Proponent would comply with Federal and State air quality standards. Particulate emissions during construction would be temporary and mitigated through adherence to the recommended mitigation measures. Operation of the solar power plant would not result in increases of Potential for Significant Deterioration emission levels in the regional area. The facility is not considered a major stationary source with potential to cause significant air quality impacts. The Project's operation would not cause new violations of any NO_2, SO_2, $PM_{2.5}$ or CO ambient air quality standards.
Geological Hazards and Mineral Resources – Sections 3.2 and 4.2		
The Proposed Action would not result in impacts to geological	The Proposed Action would not result in impacts to	The Proposed Action would not

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
resources. However, seismic activity and ground subsidence in the region could potentially impact structures constructed and operated under the Proposed Action. All project components and facilities would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize potential impacts from seismic activity. The Proposed Action would not result in impacts to mineral resources, as no active claims, mines, or quarries are present within the Project area.	geological resources. However, seismic activity and ground subsidence in the region could potentially impact structures constructed and operated under the Proposed Action. All project components and facilities would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize potential impacts from seismic activity. The Proposed Action would not result in impacts to mineral resources, as no active claims, mines, or quarries are present within the Project area.	result in impacts to geological resources. However, seismic activity and ground subsidence in the region could potentially impact structures constructed and operated under the Proposed Action. All project components and facilities would be constructed in accordance with applicable regulations, engineering protocols, and safety standards to minimize potential impacts from seismic activity. The Proposed Action would not result in impacts to mineral resources, as no active claims, mines, or quarries are present within the Project area.
Soils – Sections 3.3 and 4.3		
Direct impacts to soil resources associated with construction activities under the Proposed Action include increased water- and wind-induced soil erosion from within the Project area. No soils capable of supporting Prime Farmland would be impacted by the Proposed Action. There would be no impacts to soil resources as a result of operation or maintenance of the components or facilities under the Proposed Action. Site-specific best management practices to minimize soil erosion and sedimentation would be implemented during construction and operations. The selected erosion and sediment control best management practices 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.	Direct impacts to soil resources associated with construction activities under the Proposed Action include increased water- and wind-induced soil erosion from within the Project area. No soils capable of supporting Prime Farmland would be impacted by the Proposed Action. There would be no impacts to soil resources as a result of operation or maintenance of the components or facilities under the Proposed Action. Site-specific best management practices to minimize soil erosion and sedimentation would be implemented during construction and operations. The selected erosion and sediment control best management practices and environmental protection measures would be based on the type of disturbance expected,	Direct impacts to soil resources associated with construction activities under the Proposed Action include increased water- and wind-induced soil erosion from within the Project area. No soils capable of supporting Prime Farmland would be impacted by the Proposed Action. There would be no impacts to soil resources as a result of operation or maintenance of the components or facilities under the Proposed

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
	soil type, and the location of the site relative to sensitive resources.	Action. Site-specific best management practices to minimize soil erosion and sedimentation would be implemented during construction and operations. The selected erosion and sediment control best management practices 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.
Water Resources – Sections 3.4 and 4.4		
Under the Proposed Action (dry-cooled alternative), the demand for operational water would be 400 acre-feet per year (afy). The proposed source of the water is three existing wells, currently producing approximately 1300 afy. With either a wet- or dry-cooled option, water rights will be acquired from an existing water right owner(s), and converted from irrigation use to industrial use. The section of the Fortymile Wash that traverses the Project area will be rechanneled and designed to intercept the 100-year storm event and convey the concentrated flow to historic discharge locations south of the Project site. The Proponent is coordinating these activities with the BLM, Nye County, and the USACE. Potential impacts to water resources during construction would be primarily associated with surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. Mitigation measures are proposed to prevent spills of	Under the Proposed Action (dry-cooled alternative), the demand for operational water would be 400 acre-feet per year (afy). The proposed source of the water is three existing wells, currently producing approximately 1300 afy. With either a wet- or dry-cooled option, water rights will be acquired from an existing water right owner(s), and converted from irrigation use to industrial use. The section of the Fortymile Wash that traverses the Project area will be rechanneled and designed to intercept the 100-year storm event and convey the concentrated flow to historic discharge locations south of the Project site. The Proponent is coordinating these activities with the BLM, Nye County, and the USACE. Potential impacts to water resources during construction would be primarily associated with	Under the Proposed Action (dry-cooled alternative), the demand for operational water would be 400 acre-feet per year (afy). The proposed source of the water is three existing wells, currently producing approximately 1300 afy. With either a wet- or dry-cooled option, water rights will be acquired from an existing water right owner(s), and converted from irrigation use to industrial use. The section of the Fortymile Wash that traverses the Project area will be rechanneled and designed to intercept the 100-

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
chemicals, as well as to respond to spills should they occur.	surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. Mitigation measures are proposed to prevent spills of chemicals, as well as to respond to spills should they occur.	year storm event and convey the concentrated flow to historic discharge locations south of the Project site. The Proponent is coordinating these activities with the BLM, Nye County, and the USACE. Potential impacts to water resources during construction would be primarily associated with surface disturbing activities, but could also be a result of accidental spills and handling and storage of hazardous chemicals. Mitigation measures are proposed to prevent spills of chemicals, as well as to respond to spills should they occur.
Noise – Sections 3.5 and 4.5		
Throughout the construction of the proposed Project, temporary noise impacts are expected to briefly radiate within the defined boundaries of the project site. Under Environmental Protection Agency (EPA) guidelines for outdoor noise impacts to residential property lines, the noise impacts are considered to be less than significant and no mitigation will be required for the temporary construction operations. Operational activities of the Proposed Action were evaluated to determine the worst-case daily operational noise impacts. Under EPA noise threshold guidelines, the impacts were found to be less than significant and require no mitigation.	Throughout the construction of the proposed Project, temporary noise impacts are expected to briefly radiate within the defined boundaries of the project site. Under Environmental Protection Agency (EPA) guidelines for outdoor noise impacts to residential property lines, the noise impacts are considered to be less than significant and no mitigation will be required for the temporary construction operations. Operational activities of the Proposed Action were evaluated to determine the worst-case daily operational	Throughout the construction of the proposed Project, temporary noise impacts are expected to briefly radiate within the defined boundaries of the project site. Under Environmental Protection Agency (EPA) guidelines for outdoor noise impacts to residential property lines, the noise impacts are considered to be less than significant and no

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
Employees working within the operational areas may be exposed to areas considered as a sensitive noise receptor location. Under Occupational Safety and Health Administration (OSHA) Standards the impact of worst-case calculated noise exposure levels the impacts is considered less than significant.	noise impacts. Under EPA noise threshold guidelines, the impacts were found to be less than significant and require no mitigation. Employees working within the operational areas may be exposed to areas considered as a sensitive noise receptor location. Under Occupational Safety and Health Administration (OSHA) Standards the impact of worst-case calculated noise exposure levels the impacts is considered less than significant.	mitigation will be required for the temporary construction operations. Operational activities of the Proposed Action were evaluated to determine the worst-case daily operational noise impacts. Under EPA noise threshold guidelines, the impacts were found to be less than significant and require no mitigation. Employees working within the operational areas may be exposed to areas considered as a sensitive noise receptor location. Under Occupational Safety and Health Administration (OSHA) Standards the impact of worst-case calculated noise exposure levels the impacts is considered less than significant.
Biological Resources – Sections 3.6 and 4.6		
VEGETATION RESOURCES: Potential direct impacts to vegetation resources associated with construction activities would include clearing and grubbing of approximately 4,350 acres of creosote bush-dominated native vegetation for the duration of the proposed Project life, and the potential to introduce or spread non-native weeds already present in the Project area or brought in by contaminated vehicles. No potential habitats for federally listed threatened or endangered plant species occur within the Project area; however, two state	VEGETATION RESOURCES: Potential direct impacts to vegetation resources associated with construction activities would include clearing and grubbing of approximately 4,350 acres of creosote bush-dominated native vegetation for the duration of the proposed Project life, and the potential to introduce or spread non-native weeds already present in the Project area or brought in by contaminated vehicles.	VEGETATION RESOURCES: Potential direct impacts to vegetation resources associated with construction activities would include clearing and grubbing of approximately 4,350 acres of creosote bush-dominated native vegetation for the duration of the proposed Project life, and the potential to

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
protected cacti species are present and would need to be salvaged in accordance with NRS 527.060-120. Indirect impacts to vegetation resources include soil compaction, changes to soil structure by use of dust suppression, spread of non-native weeds already present in the Project area and brought in by contaminated vehicles, and changes in the distribution of precipitation falling on the solar fields. WILDLIFE RESOURCES: Direct impacts 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 (e.g. non-native invasive species replacing native species), causing fragmentation, loss of connectivity for wildlife, increased predation, and altering soil characteristics. Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals. Mortality could also occur from collisions with equipment and vehicles. Predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Removal of vegetation, alteration of Fortymile Wash, and placement of fencing around parameter of the solar fields, could impede travel opportunities for wildlife. The Project area contains low quality, but suitable habitat for Desert Tortoise. Four old Class IV burrows were located within the Project area. Efforts will be made to ensure that the area is clear of any active burrows and all live tortoises prior to any construction being conducted. Direct impacts on migratory birds could result from ground disturbance during construction. Construction activities may impact suitable habitat for nesting and burrowing birds including Burrowing Owl, a BLM Sensitive species and a Nevada animal species considered to be at risk in all counties in Nevada. Old burrowing Owl burrows	No potential habitats for federally listed threatened or endangered plant species occur within the Project area; however, two state protected cacti species are present and would need to be salvaged in accordance with NRS 527.060-120. Indirect impacts to vegetation resources include soil compaction, changes to soil structure by use of dust suppression, spread of non-native weeds already present in the Project area and brought in by contaminated vehicles, and changes in the distribution of precipitation falling on the solar fields. WILDLIFE RESOURCES: Direct impacts 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 (e.g. non-native invasive species replacing native species), causing fragmentation, loss of connectivity for wildlife, increased predation, and altering soil characteristics. Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals. Mortality could also occur from collisions with equipment and vehicles. Predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Removal of vegetation, alteration of Fortymile Wash, and placement of fencing around parameter of the solar fields, could impede travel opportunities for wildlife. The Project area contains low quality, but suitable habitat for Desert Tortoise. Four old Class IV burrows	introduce or spread non-native weeds already present in the Project area or brought in by contaminated vehicles. No potential habitats for federally listed threatened or endangered plant species occur within the Project area; however, two state protected cacti species are present and would need to be salvaged in accordance with NRS 527.060-120. Indirect impacts to vegetation resources include soil compaction, changes to soil structure by use of dust suppression, spread of non-native weeds already present in the Project area and brought in by contaminated vehicles, and changes in the distribution of precipitation falling on the solar fields. WILDLIFE RESOURCES: Direct impacts 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

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
were found in the Project area. For other nesting bird species, direct impacts could include eliminating potential nesting habitat and loss of individuals. The Migratory Bird Treaty Act (MBTA) applies to species that would be impacted during the construction phase of the Project. Other sensitive species observed within the Project area include Prairie Falcon and LeConte's Thrasher. There would be direct impacts to LeConte's Thrasher by eliminating suitable nesting habitat. Direct impacts on Desert Tortoise can result from loss of tortoise habitat; including loss of old burrow sites, located in the northwest quarter of the Project area. Permanent loss of native vegetation would directly impact at least 12 snake and lizard species that were found in the Project area. Two such species include, Desert Iguana, included on the Nevada Natural Heritage Program Animal Watch List, and Nevada Shovel-nosed Snake, included as a conservation priority species in Nevada. Under the Proposed Action, the Proponent would purchase or lease existing water rights and convert the type of water use from current agricultural use to industrial use. As such, the proposed Project would not increase pumping in the hydrographic basin. Using the best available model and a conservative assumption that Project pumping would add to, rather than replace existing pumping impacts to water levels in Devils Hole were determined to be negligible. Therefore, indirect impacts from groundwater pumping to Devils Hole and associated sensitive wildlife species are also presumed to be negligible.	were located within the Project area. Efforts will be made to ensure that the area is clear of any active burrows and all live tortoises prior to any construction being conducted. Direct impacts on migratory birds could result from ground disturbance during construction. Construction activities may impact suitable habitat for nesting and burrowing birds including Burrowing Owl, a BLM Sensitive species and a Nevada animal species considered to be at risk in all counties in Nevada. Old burrowing Owl burrows were found in the Project area. For other nesting bird species, direct impacts could include eliminating potential nesting habitat and loss of individuals. The Migratory Bird Treaty Act (MBTA) applies to species that would be impacted during the construction phase of the Project. Other sensitive species observed within the Project area include Prairie Falcon and LeConte's Thrasher. There would be direct impacts to LeConte's Thrasher by eliminating suitable nesting habitat. Direct impacts on Desert Tortoise can result from loss of tortoise habitat; including loss of old burrow sites, located in the northwest quarter of the Project area. Permanent loss of native vegetation would directly impact at least 12 snake and lizard species that were found in the Project area. Two such species include, Desert Iguana, included on the Nevada Natural Heritage Program Animal Watch List, and Nevada Shovel-nosed Snake, included as a conservation priority species in Nevada. Under the Proposed Action, the Proponent would purchase or lease existing water rights and convert the type of water use from current agricultural use to industrial use. As such, the proposed Project would not	structure (e.g. non-native invasive species replacing native species), causing fragmentation, loss of connectivity for wildlife, increased predation, and altering soil characteristics. Pre-construction clearance surveys would be conducted to ensure that activities associated with the construction and operation of the Project would not cause mortality to individuals. Mortality could also occur from collisions with equipment and vehicles. Predation could increase as construction displaces wildlife from protected cover to uncovered habitat. Removal of vegetation, alteration of Fortymile Wash, and placement of fencing around parameter of the solar fields, could impede travel opportunities for wildlife. The Project area contains low quality, but suitable habitat for Desert Tortoise. Four old Class IV burrows were located within the Project area. Efforts will be made to ensure that the area is clear of any active burrows and all live tortoises prior to any construction being conducted. Direct impacts on migratory

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
	increase pumping in the hydrographic basin. Using the best available model and a conservative assumption that Project pumping would add to, rather than replace existing pumping impacts to water levels in Devils Hole were determined to be negligible. Therefore, indirect impacts from groundwater pumping to Devils Hole and associated sensitive wildlife species are also presumed to be negligible.	birds could result from ground disturbance during construction. Construction activities may impact suitable habitat for nesting and burrowing birds including Burrowing Owl, a BLM Sensitive species and a Nevada animal species considered to be at risk in all counties in Nevada. Old burrowing Owl burrows were found in the Project area. For other nesting bird species, direct impacts could include eliminating potential nesting habitat and loss of individuals. The Migratory Bird Treaty Act (MBTA) applies to species that would be impacted during the construction phase of the Project. Other sensitive species observed within the Project area include Prairie Falcon and LeConte's Thrasher. There would be direct impacts to LeConte's Thrasher by eliminating suitable nesting habitat. Direct impacts on Desert Tortoise can result from loss of tortoise habitat; including loss of old burrow sites, located in the northwest quarter of the Project area. Permanent loss of native vegetation would directly impact

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative		
Proposed Action	**Wet-Cooled Alternative**	**No Action Alternative**
		at least 12 snake and lizard species that were found in the Project area. Two such species include, Desert Iguana, included on the Nevada Natural Heritage Program Animal Watch List, and Nevada Shovel-nosed Snake, included as a conservation priority species in Nevada. Under the Proposed Action, the Proponent would purchase or lease existing water rights and convert the type of water use from current agricultural use to industrial use. As such, the proposed Project would not increase pumping in the hydrographic basin. Using the best available model and a conservative assumption that Project pumping would add to, rather than replace existing pumping impacts to water levels in Devils Hole were determined to be negligible. Therefore, indirect impacts from groundwater pumping to Devils Hole and associated sensitive wildlife species are also presumed to be negligible.

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
Historic and Cultural Resources – Sections 3.7 and 4.7		
Sixteen cultural resource sites were identified within the Area of Potential Effects of the Proposed Action. Only one site has been determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion D. Direct effects to this site could occur as a result of ground disturbing activities associated with the construction of the proposed Project. An Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site would be prepared. It is anticipated that any potential direct impacts from Project construction would be fully mitigated through data recovery. If previously unidentified cultural resources, human remains, or funerary items are discovered during Project activities, the procedures outlined in the BLM Nevada State Protocol Agreement would be implemented.	Sixteen cultural resource sites were identified within the Area of Potential Effects of the Proposed Action. Only one site has been determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion D. Direct effects to this site could occur as a result of ground disturbing activities associated with the construction of the proposed Project. An Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site would be prepared. It is anticipated that any potential direct impacts from Project construction would be fully mitigated through data recovery. If previously unidentified cultural resources, human remains, or funerary items are discovered during Project activities, the procedures outlined in the BLM Nevada State Protocol Agreement would be implemented.	Sixteen cultural resource sites were identified within the Area of Potential Effects of the Proposed Action. Only one site has been determined eligible for listing on the National Register of Historic Places (NRHP) under Criterion D. Direct effects to this site could occur as a result of ground disturbing activities associated with the construction of the proposed Project. An Historic Properties Treatment Plan describing the mitigation measures that would be employed to resolve any adverse effect to the one NRHP eligible site would be prepared. It is anticipated that any potential direct impacts from Project construction would be fully mitigated through data recovery. If previously unidentified cultural resources, human remains, or funerary items are discovered during Project activities, the procedures outlined in the BLM Nevada State Protocol Agreement would be implemented.

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
Paleontological Resources – Sections 3.8 and 4.8		
No previously discovered paleontological localities have been identified within the Project area. However, a geological unit with an undetermined potential for containing significant paleontological resources was identified within the Project area. The probability is low that construction activities under the Proposed Action may result in the exposure of paleontological resources in this geological unit, which consists of marl deposits that represent Pleistocene spring deposits. There would be no impacts to paleontological resources as a result of operation or maintenance of the components or facilities under the Proposed Action.	No previously discovered paleontological localities have been identified within the Project area. However, a geological unit with an undetermined potential for containing significant paleontological resources was identified within the Project area. The probability is low that construction activities under the Proposed Action may result in the exposure of paleontological resources in this geological unit, which consists of marl deposits that represent Pleistocene spring deposits. There would be no impacts to paleontological resources as a result of operation or maintenance of the components or facilities under the Proposed Action.	No previously discovered paleontological localities have been identified within the Project area. However, a geological unit with an undetermined potential for containing significant paleontological resources was identified within the Project area. The probability is low that construction activities under the Proposed Action may result in the exposure of paleontological resources in this geological unit, which consists of marl deposits that represent Pleistocene spring deposits. There would be no impacts to paleontological resources as a result of operation or maintenance of the components or facilities under the Proposed Action.
Socioeconomic Resources – Sections 3.9 and 4.9		
Construction of the proposed Project would last 39 months. Construction is expected to directly create an average of about 650 annual full-time employment (FTEs) over 39 months, with a peak monthly employment of about 1,300 FTEs. This direct employment will create both indirect and induced secondary employment in the regional area. For all projects in the region, temporary housing	Construction of the proposed Project would last 39 months. Construction is expected to directly create an average of about 650 annual full-time employment (FTEs) over 39 months, with a peak monthly employment of about 1,300 FTEs. This direct employment will create both indirect and induced	Construction of the proposed Project would last 39 months. Construction is expected to directly create an average of about 650 annual full-time employment (FTEs) over 39

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
facilities would be needed and the added population during construction could place a burden on local social and public services. The construction payroll has been estimated at approximately $68.8 million annually. Capital expenditures and local spending on construction materials and equipment within the ROI are estimated to total approximately $47.1 million annually. During construction, the proposed Project would generate up to $34 million for Nye County in property taxes, and pay approximately $45 million in sales tax to the State of Nevada for the Local School Support Tax. During operation, it is expected that the annual purchases for materials supplies, equipment, and services within the ROI would total approximately $6.0 million. For example, if all purchases are made within Nye County, which has a current tax rate of 7.1 percent, these expenditures would generate approximately $355,000 in annual sales tax revenue.	secondary employment in the regional area. For all projects in the region, temporary housing facilities would be needed and the added population during construction could place a burden on local social and public services. The construction payroll has been estimated at approximately $68.8 million annually. Capital expenditures and local spending on construction materials and equipment within the ROI are estimated to total approximately $47.1 million annually. During construction, the proposed Project would generate up to $34 million for Nye County in property taxes, and pay approximately $45 million in sales tax to the State of Nevada for the Local School Support Tax. During operation, it is expected that the annual purchases for materials supplies, equipment, and services within the ROI would total approximately $6.0 million. For example, if all purchases are made within Nye County, which has a current tax rate of 7.1 percent, these expenditures would generate approximately $355,000 in annual sales tax revenue.	months, with a peak monthly employment of about 1,300 FTEs. This direct employment will create both indirect and induced secondary employment in the regional area. For all projects in the region, temporary housing facilities would be needed and the added population during construction could place a burden on local social and public services. The construction payroll has been estimated at approximately $68.8 million annually. Capital expenditures and local spending on construction materials and equipment within the ROI are estimated to total approximately $47.1 million annually. During construction, the proposed Project would generate up to $34 million for Nye County in property taxes, and pay approximately $45 million in sales tax to the State of Nevada for the Local School Support Tax. During operation, it is expected that the annual purchases for materials supplies, equipment, and services within the ROI would total approximately $6.0 million. For example, if all

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
		purchases are made within Nye County, which has a current tax rate of 7.1 percent, these expenditures would generate approximately $355,000 in annual sales tax revenue.
Environmental Justice – Sections 3.10 and 4.10		
Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the environmental justice population disproportionately.	Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the environmental justice population disproportionately.	Potential direct and indirect impacts associated with the Proposed Action would not have a disproportionate effect on low-income or minority populations. There are no special issues, such as housing, transportation, access, or resource use in the Project area that would affect the environmental justice population disproportionately.
Land Use, Recreation, Transportation and Access – Sections 3.11 and 4.11		
LAND USE: Construction and operation of the Proposed Action would permanently disturb approximately 4,350 acres, and would make this acreage unavailable to be developed for other uses. No residential, commercial, or industrial land uses would be directly impacted by construction or operation of the proposed Project. TRANSPORTATION AND ACCESS: The proposed Project would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on local unimproved roads may contribute to road deterioration. No access to commercial or residential areas would be restricted; however	LAND USE: Construction and operation of the Proposed Action would permanently disturb approximately 4,350 acres, and would make this acreage unavailable to be developed for other uses. No residential, commercial, or industrial land uses would be directly impacted by construction or operation of the proposed Project. TRANSPORTATION AND ACCESS: The proposed Project would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on local unimproved	LAND USE: Construction and operation of the Proposed Action would permanently disturb approximately 4,350 acres, and would make this acreage unavailable to be developed for other uses. No residential, commercial, or industrial land uses would be directly impacted by construction or operation of

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
construction activity could potentially delay users' daily commute times within the Valley's transportation network. Operation of the Proposed Action would have long-term, cumulative impacts on traffic flows and volumes on roadways when combined with the other proposed energy projects and the commercial activity associated with increased industry in the area. All disturbance areas not covered by project facilities would be reclaimed in accordance with BLM protocols. RECREATION and SPECIAL MANAGEMENT AREAS: The proposed Project would not preclude the use of recreation and special management areas, but would remove land currently available for dispersed recreation on the Project site. Operation and maintenance of the Project facilities would not limit public access to recreation opportunities in the surrounding area.	roads may contribute to road deterioration. No access to commercial or residential areas would be restricted; however construction activity could potentially delay users' daily commute times within the Valley's transportation network. Operation of the Proposed Action would have long-term, cumulative impacts on traffic flows and volumes on roadways when combined with the other proposed energy projects and the commercial activity associated with increased industry in the area. All disturbance areas not covered by project facilities would be reclaimed in accordance with BLM protocols. RECREATION and SPECIAL MANAGEMENT AREAS: The proposed Project would not preclude the use of recreation and special management areas, but would remove land currently available for dispersed recreation on the Project site. Operation and maintenance of the Project facilities would not limit public access to recreation opportunities in the surrounding area.	the proposed Project. TRANSPORTATION AND ACCESS: The proposed Project would have short-term impacts on traffic flows and volumes on area roadways. Increased construction traffic on local unimproved roads may contribute to road deterioration. No access to commercial or residential areas would be restricted; however construction activity could potentially delay users' daily commute times within the Valley's transportation network. Operation of the Proposed Action would have long-term, cumulative impacts on traffic flows and volumes on roadways when combined with the other proposed energy projects and the commercial activity associated with increased industry in the area. All disturbance areas not covered by project facilities would be reclaimed in accordance with BLM protocols. RECREATION and SPECIAL MANAGEMENT AREAS: The proposed Project would not

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
		preclude the use of recreation and special management areas, but would remove land currently available for dispersed recreation on the Project site. Operation and maintenance of the Project facilities would not limit public access to recreation opportunities in the surrounding area.
Visual Resources – Sections 3.12 and 4.12		
Visual impacts would occur during the construction of the proposed project based on the introduction of construction equipment, higher levels of traffic, potential fugitive dust, and new forms of night lighting in the foreground distance zone of high sensitivity residential viewers along Sandy Lane and adjacent to Valley View Estates. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g. solar troughs, power block, transmission lines, and ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term impacts are anticipated to range from low to moderate based on the relatively low profile of the project and the occurrence of various existing landscape features (i.e. topography, ornamental vegetation, and structures associated with the town of Amargosa Valley) that would screen the project and reduce contrast from moderate and high sensitivity viewers. Limited occurrences of high impacts would occur where moderate to high sensitivity viewers would have unobstructed views of the project in the foreground distance zone (i.e. Sandy Lane and Valley View Estates residences). Compliance is anticipated with BLM Visual Resource Management (VRM) Class IV objectives.	Visual impacts would occur during the construction of the proposed project based on the introduction of construction equipment, higher levels of traffic, potential fugitive dust, and new forms of night lighting in the foreground distance zone of high sensitivity residential viewers along Sandy Lane and adjacent to Valley View Estates. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g. solar troughs, power block, transmission lines, and ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term impacts are anticipated to range from low to moderate based on the relatively low profile of the project and the occurrence of various existing landscape features (i.e. topography, ornamental vegetation, and structures associated with the town of Amargosa Valley) that would screen the project and reduce contrast from moderate and high sensitivity viewers. Limited occurrences of high impacts would occur where moderate to high sensitivity viewers would have unobstructed views of	Visual impacts would occur during the construction of the proposed project based on the introduction of construction equipment, higher levels of traffic, potential fugitive dust, and new forms of night lighting in the foreground distance zone of high sensitivity residential viewers along Sandy Lane and adjacent to Valley View Estates. Long term impacts would be based on the introduction of moderate/strong visual contrast associated with Project components (e.g. solar troughs, power block, transmission lines, and ancillary buildings) within a rural to natural setting that would be visible to moderate and high sensitivity viewers. The majority of long term

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
	the project in the foreground distance zone (i.e. Sandy Lane and Valley View Estates residences). Compliance is anticipated with BLM Visual Resource Management (VRM) Class IV objectives.	impacts are anticipated to range from low to moderate based on the relatively low profile of the project and the occurrence of various existing landscape features (i.e. topography, ornamental vegetation, and structures associated with the town of Amargosa Valley) that would screen the project and reduce contrast from moderate and high sensitivity viewers. Limited occurrences of high impacts would occur where moderate to high sensitivity viewers would have unobstructed views of the project in the foreground distance zone (i.e. Sandy Lane and Valley View Estates residences). Compliance is anticipated with BLM Visual Resource Management (VRM) Class IV objectives.
Hazardous Materials and Waste – Sections 3.13 and 4.13		
Potential wastes that could be generated at the site include domestic non-hazardous solid waste, hazardous wastes or materials, and used wastes that can be recycled. These types of substances, materials, and wastes most likely would be present during stages of construction, development, and operation of the facility. During all stages of plant construction and operation, strict compliance with all Federal, state, and local regulations governing the management of hazardous	Potential wastes that could be generated at the site include domestic non-hazardous solid waste, hazardous wastes or materials, and used wastes that can be recycled. These types of substances, materials, and wastes most likely would be present during stages of construction, development, and operation of the facility. During all stages of plant construction and operation, strict compliance with all Federal, state, and	Potential wastes that could be generated at the site include domestic non-hazardous solid waste, hazardous wastes or materials, and used wastes that can be recycled. These types of substances, materials, and wastes most likely would be

Table 2-5 Summary of Impacts by Resources for the Amargosa Farm Road Solar Energy Project Proposed Action, Wet-Cooled Alternative, and No Action Alternative

Proposed Action	Wet-Cooled Alternative	No Action Alternative
materials is required by law.	local regulations governing the management of hazardous materials is required by law.	present during stages of construction, development, and operation of the facility. During all stages of plant construction and operation, strict compliance with all Federal, state, and local regulations governing the management of hazardous materials is required by law.

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