

PERMIT MODIFICATION APPLICATION
PERMIT NUMBER SW174R02
NORTH VALMY POWER PLANT CLASS III LANDFILL
HUMBOLDT COUNTY, NEVADA

Prepared for:
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Project No.: 002-047

1.0 INTRODUCTION

Applied Soil Water Technologies, LLC (ASW) is submitting this modification to the current permit SW174R02 to assist NV Energy in obtaining a permit modification to increase the capacity of the Class III Landfill (Landfill) at their North Valmy Power Plant (NVPP). Site-specific data is used within this application and associated reports to provide technical justification for the proposed modifications.

The proposed modifications include:

- Increase the height of the currently permitted landfill from elevation 4,460 feet above mean sea level (amsl) to 4,630 feet amsl.
- Increase the total volume and disposal capacity of the currently permitted landfill from 6,000,000 and 5,000,000 million cubic yards to 24,717,000 and 23,944,500 cubic yards respectively.
- Incorporate industrial waste into the landfill eliminating the need for the separate construction and demolition debris landfill currently operated under waiver SWMI-08-01.
- Add the following materials to waste streams that can be accepted into the landfill:
 - Evaporation Pond Solids,
 - Evaporation Pond Liner,
 - Scrubber Waste,
 - Clarifier Waste,
 - Cooling Tower Waste, and;
 - Pyrites Clean Out Waste.

Disposal Capacity used as of June 30, 2012 was 3,990,000 cubic yards (Bear Engineering, 2012).

The landfill modifications are in accordance with the requirements outlined in NAC 444.731 through NAC 444.747, inclusive.

2.0 BACKGROUND

2.1 North Valmy Site Description and Features

The NVPP is located in Humboldt County, Nevada, approximately fifteen miles northwest of Battle Mountain, Nevada (see Figure 1). NVPP is an electric power generating facility jointly owned by NV Energy and Idaho Power Company. The power station consists of two coal-fired steam turbine generators. Unit 1 is rated at 250 megawatts, net. Unit 2 is rated at 270 megawatts, net. Coal is transported to the site by rail and stockpiled northeast of Units 1 and 2. Other facilities at the site include transformers, a dry scrubber, baghouses, warehouses, office buildings, water aboveground storage tanks (ASTs), an ignition oil AST, cooling towers and a switchyard. The site also includes six evaporation ponds in the western portion of the site. NVPP normally obtains its water from approximately 20 groundwater wells located up to 15 miles east and southeast from the power plant.

2.2 Physical Setting

The NVPP lies in the central Humboldt River Valley in the Clovers Hydrographic Basin, within the Basin and Range geomorphic province. The surrounding mountain ranges are composed of bedrock ranging in age from Paleozoic to Cenozoic. Several small bedrock outcrops are also present near the NVPP, notably at Lone Tree Hill and Treaty Hill (SWS, 2012a).

The soil at the site consists of what are most likely alluvial fan deposits overlying older alluvial and lacustrine deposits (SWS, 2012a). The superficial deposits across the site consist of 2 to 3 feet of silty fine sand. Interbedded beneath the silty sand is approximately 10 to 25 feet of gravelly sand and sandy gravel. Beneath this gravelly layer, the soil transitions into a 2 to 10 foot thick layer of medium to fine sand with silt. The fine sand with silt then grades into clay with occasional interbedded fine sand and silt layers. Depending on the depth to bedrock this clay layer ranges in thickness from 45 feet to approximately 85 feet. Bedrock beneath the site consists of basalt. As determined by downhole drilling conducted by Schlumberger Water Services and Applied Soil Water Technologies basaltic bedrock can be encountered anywhere from 38 to 80 feet below the ground surface near the site.

Laboratory testing for hydraulic conductivity was performed on two samples taken from the clay layer described above. A sample taken from borehole B-3 at a depth of 20 feet below the ground surface showed a hydraulic conductivity of 3.2×10^{-6} cm/sec. A sample taken from borehole B-4 at a depth of 60 feet below the ground surface showed a hydraulic conductivity of 5.0×10^{-6} cm/sec. While this layer does contain some interbedded fine sand and silt, its thickness and continuity across the site, essentially make this a confining layer to the downward movement of surface water.

2.3 Site History and Land Use

Unit 1 began operation in 1981 (CH2M HILL, 1998). Unit 2 was added in 1985. Prior to power station construction, the site was agricultural land used for ranching and undeveloped land (CH2M HILL, 1998).

2.4 Adjacent Property Land Use

Adjacent property southwest of the NVPP is occupied by an abandoned turn of the century homestead consisting of a house, barn, stables, and outbuildings. The Lone Tree Gold Mine is located approximately 4 miles directly south of the NVPP. The remaining property is undeveloped land used for open range cattle grazing. Union Pacific railroad tracks and Interstate 80 exist approximately 2.5 and 3 miles southwest of the power plant, respectively.

2.5 Owner & Operator Data

The NVPP is a privately owned and operated facility. The owner and operator mailing addresses are presented below:

Joint Owners: Sierra Pacific Power Company d/b/a NV Energy
6226 West Sahara Ave., MS #30
Las Vegas, Nevada 89146

Idaho Power Company
1221 West Idaho St.
Boise, ID 83702

Operator: Sierra Pacific Power Company d/b/a NV Energy
6226 West Sahara Ave., MS #30
Las Vegas, Nevada 89146

2.6 Proof of Ownership

The NVPP Landfill resides within a fenced perimeter entirely on privately owned land in Section 20, 21, 28, and 29, Township 35 North, Range 43 East. (see Appendix A for proof of Ownership).

3.0 LOCATION (NAC 444.735)

The landfill is sited within the fenced perimeter of the NVPP approximately 15 miles northwest of Battle Mountain, Nevada and approximately 3.5 miles north of Interstate 80. (Figure 1). The landfill is not accessible to the general public and is accessible only to NVPP employees and authorized subcontractors for the disposal of waste which is generated only at NVPP. Descriptions of the waste are provided within this application

3.1 Site Description

NVPP's Landfill site consists of one unit located in Sections 20, 21, 28, and 29 of Township 35 North, Range 43 East. The elevation of the site ranges from 4,420 to 4,459 feet above mean sea level and is relatively flat with slopes up to 4%. General topography of the surrounding area is presented in Figure 1 and a topographic map of the site is shown in the design drawings provided in the Engineering Design Report (ASW 2013).

3.2 Restrictions

The Landfill meets the location restrictions set-forth in NAC 444.735.

NAC 444.735 Location. *The location of a Class III Landfill must:*

- (1) *Be easily accessible in all kinds of weather to all vehicles expected to use it.*

NVPP's Landfill site is accessed utilizing roads that are either gravel or native graded soils. NVPP currently operates in all kinds of weather utilizing the earthmoving equipment described in the Operations Plan.

- (2) *Safeguard against water pollution originating from the decomposed solid waste at the site.*

Decomposition is not anticipated due to the fact that the waste being disposed of is essentially inert with negligible if any organic content. A detailed description of the waste streams is presented in Section 4.0, Solid Waste Characterization.

- (3) *Safeguard against uncontrolled movement or collection of gas originating from the decomposed waste at the site.*

Any organic material that may be present in the coal is eliminated when the coal is burned to heat up the boilers at the NVPP. Therefore, the potential for waste decomposition and gas generation is essentially nonexistent

- (4) *Have an adequate quantity of cover material that is workable, compactible, and does not contain organic material of a quantity and distribution conducive to the harboring and breeding of disease vectors.*

The landfill will have upon closure a minimum 3-foot native soil cover. It is estimated that 772,500 CY of cover material are required. Approximately 341,900 CY of cover material will be derived from excavations performed at the base of the landfill. The remaining balance of the cover material will be derived from currently stockpiled material and material coming from a NVPP owned borrow source west of the Landfill and north of Evaporation Pond A.

- (5) *Conform to the land use planning area.*

The Landfill lies within the fenced perimeter of the NVPP. The NVPP is dedicated to the generation of power with land use planning at the discretion of Sierra Pacific Power Company d/b/a NV Energy.

- (6) *Not be within one-fourth mile of the nearest inhabited domestic dwelling or place of public gathering or be within 1,000 feet of a public highway, unless special provisions for the beautification of the site and the control of litter vectors are included in the design and approved by the solid waste management authority.*

The Landfill site is approximately 15 miles northwest of Battle Mountain, Nevada and is located over 3.5 miles (18,480 feet) north of Interstate 80 (Figure 1).

- (7) *Unless approved by the solid waste management authority, not be within 1,000 feet of any surface water or be within 100 feet of the uppermost aquifer if the site is approved after September 2, 1992.*

The facility was approved by the NDEP prior to September 2, 1992; therefore these criteria do not apply.

4.0 SOLID WASTE CHARACTERIZATION (NAC 444.737)

NVPP's Landfill will accept only fly and bottom ash, fly ash coated bags from the bag houses, sand blast media, cooling tower lumber, wood pallets, PVC and plastic type tubing and hoses, cooling tower sludge, clarifier waste, scrubber waste, pyrites clean out waste, dewatered pond solids, crushed empty containers, weeds, and various construction debris generated from the NVPP. Municipal solid waste such as lunchroom waste, paper, cardboard, plastic, etc. will continue to be disposed of at an off-site landfill in either Humboldt or Lander County using a garbage disposal contractor. Pond solids, fly ash, bottom ash, sand blast media cooling tower lumber and clarifier solids have been tested via "EPA Methods for Evaluating Solid Wastes Physical/Chemical Methods (SW 846) Test Methods 9045B, 6010B and 7470A for Toxicity Characteristics Leaching Procedure (TCLP) which tests for pH, Arsenic, Barium, Cadmium, Lead, Selenium, Silver, Mercury, TCLP 11 Organics and Ignitability. TCLP concentrations (summarized in Appendix B) are below regulatory levels. These low extraction and mobilization levels minimize the potential for groundwater contamination as evidenced by groundwater monitoring results (Schlumberger Water Services, 2012a and 2012b). Solid waste streams listed above not previously tested will be tested by methods described above and have no hazardous waste characteristics prior to placement into the NVPP landfill.

It should also be noted that fly ash and bottom ash are specifically deemed non-hazardous by CFR261.4 (b) (4) also known as the Bevill Amendment.

4.1 Fly and Bottom Ash

Bottom ash (coarse ash collected at the bottom of the boiler) and pulverizer rejects (pyrites) are sluiced from the plant to dewatering bins and dewatered before being trucked to the landfill. Because this material maintains sufficient moisture and is coarse it is not subject to blowing or dusting and is easily landfilled.

Fly ash (light portion of the coal ash carried up the flue) is collected in the bag houses and economizers and transported dry to the fly ash silo. At the bottom of the silo a drum type rotary unloader with water sprays allows for controlled discharge to haul trucks for disposal.

4.2 Evaporation Pond Solids

Spent process water from the NVPP is sent by pipeline to six lined surface impoundment ponds for evaporation. Particulate matter and mineral precipitates are deposited at the outfall of the delivery pipe and on the geomembrane liner of each of the ponds. Through the life of the NVPP, each pond will be periodically drained, pond solids removed and the geomembrane liner replaced. At those times, the accumulated solids will be allowed to dry and will be removed from the

ponds and placed in the landfill. The geomembrane liner removed from the ponds will also be placed in the landfill.

It is anticipated that up to 50,000 tons (approximately 26,000 cubic yards) of pond solids will be removed from the existing ponds in the short term, as the liners are replaced. In the long term, sediment will periodically be removed from the inlets to the lined ponds. This is expected to result in up to 7,400 tons (2,100 cubic yards) of pond sediment being placed in the landfill at intervals of several years. The anticipated total volume of pond sediment is approximately 60,000 cubic yards. All pond sediment will be allowed to drain and will be demonstrated to pass the paint filter test prior to transportation to the landfill.

Methods for determination of Organic compounds in Drinking Water, EPA Method 600/4-79-020 and test methods for evaluation of solid waste, physical/chemical methods (SW846) Third Edition for TCLP will be used to characterize the potential for leaching of the pond sediment prior to disposal. If the material is determined to be hazardous it will be disposed of offsite as appropriate.

4.3 Scrubber Waste

Lime is utilized in the Scrubber by itself or mixed with fly ash referred to as recycled ash for SO₂ removal. Both concentrates are usually mixed with water. Waste generated in the scrubber will generally be in a dry form of lime and/or fly ash, or in the form of sludge that is cleaned out of tanks, sumps and trenches.

Scrubber waste cleaned out of buildings, tanks, sumps and trenches is generally removed via vacuum truck and taken to the landfill or by personnel utilizing shovels, skip loaders, etc. The waste product is then loaded in a dump truck and transported to the landfill.

4.4 Clarifier Waste

The clarifier is a large water softener designed to remove the calcium and magnesium (hardness) from our raw water source. This process utilizes soda ash, magnesium oxide and coagulants. The hardness that is removed falls to the bottom of the clarifier tank and builds a bed of sludge, which requires to be cleaned out periodically. Soda ash and magnesium oxide waste can also be in the dry form.

Clarifier waste cleaned out of buildings, tanks, sumps, trenches and containments is generally removed via Vacuum Truck and taken to the landfill or by personnel utilizing shovels, skip loaders, etc. The waste product is then loaded in a dump truck and transported to the landfill.

4.5 Cooling Tower Waste

Cooling towers cool water by evaporation. Through this process impurities from the cooled water settles out in the tower basin in the form of sludge. Also the Cooling Towers are exposed to the environment and collects dust/sand that is naturally wind blown into the towers.

Construction debris from the tower can consist of wood, pressure treated wood, plastic, wire, fiberglass.

Cooling Tower waste cleaned out of buildings, structures, basins, sumps, trenches and containments is generally removed via Vacuum Truck, loaders or manual labor and transported to the landfill via dump truck.

4.6 Pyrites Clean Out Waste

Pyrites come from our coal pulverizers. Impurities in coal such as rock, sand, iron pyrites, and tramp iron are removed in the grinding process and rejected into a hopper. Pyrites are generally conveyed to the bottom ash removal system. At times the hoppers are manually cleaned out and the waste disposed of.

Pyrites waste cleaned out of hoppers, sumps, trenches and containments is generally removed via Vacuum Truck and taken to the landfill or by personnel utilizing shovels, skip loaders, etc. The waste product is then loaded in a dump truck and transported to the landfill.

4.7 Industrial Solid Waste

Operation of the NVPP will result in non-hazardous industrial waste streams in addition to those previously mentioned being placed in the landfill. These waste streams meet the definition of an Industrial Solid Waste (NAC 444.585) and will be generated from the generation of electrical power, treatment of water and refurbishment of or demolition of buildings or other structures. The industrial waste stream will largely consist of, but not be limited to, wooden pallets and crates and wood cooling tower supports. Light weight material that may become airborne will not be disposed of in the landfill. Material which has been documented as non-hazardous will be placed in the landfill, with an appropriate note in the operating record. Any material for which documentation cannot be located will be sampled and analyzed using TCLP methods, as described in Section 4.0 before final disposal. Any material identified as hazardous will be disposed of off-site, as appropriate. It is anticipated that the volume of industrial waste will not exceed 700 cubic yards per year or a total volume of up to 23,800 cubic yards over the life of the proposed landfill. This material will be co-mingled with the ash materials.

4.8 Waste Stream Assurance

Assurance that the Landfill receives only permitted waste is addressed in detail in the Facility Operating Plan.

5.0 LANDFILL DESIGN (NAC 444.739)

The landfill is designed with 20 foot high benches with 1.25:1 (horizontal: vertical) exterior slopes. The design incorporates 35 foot setbacks between benches resulting in a 3:1 (horizontal to vertical) overall slope angle. Benches are sloped at 2-percent back to the toe of the overlying bench to transmit runoff water to the collection channels. The intermediate benches are graded at 3-percent to promote water to flow northerly to one of two runoff channels; northeast and northwest run-off channels meet a single channel flowing to a storm water pond located northwest of the landfill. Details of the design are presented in the Engineering Design Report (ASW, 2013).

5.1 Certification Requirements

Modification to the existing permit application and modified design as presented on the Engineering Design Report were prepared by Applied Soil Water Technologies, LLC under the responsible care of Robert B. Valceschini, P.E. The Responsibility Statement is provided in Appendix C.

The Revised Groundwater Monitoring Plan, Updated Statistical Analysis and leachate generation potential modeling were performed by Schlumberger Water Services (SWS 2012a and 2012b).

5.2 Location and Topography

Design drawings provided in the Engineering Design Report (ASW, 2013) include a topographic map of the area that shows one foot contours at a horizontal scale of one inch per 200 feet.

5.3 Site Capacity

The proposed modification provides an increase in total volume of 18,717,000 cubic yards (CY) above the currently permitted total volume of 6,000,000 CY. Therefore the proposed modification results in a total volume of 24,717,000 CY. Three feet of final cover occupies approximately 772,500 cubic yards, resulting in an increase of Disposal Capacity from 5,000,000 CY to 23,944,500 CY.

5.4 Configuration

Approximately 157 acres of privately owned land has been designated as the landfill disposal area. The location of the landfill and the disposal area boundary are presented in the Engineering Design Report (ASW, 2013).

5.4.1 Landfill Development

The NVPP Landfill is being constructed utilizing 100 foot wide borrow lanes. The phased approach involves the excavation of topsoil and proposed cover material. The topsoil and proposed cover material is composed mostly of silty fine sands existing to depths varying from 1 to 6.5 feet below the ground surface. The excavated soils are placed directly adjacent to the excavation for use later as cover material. A gravelly sand is typically found underlying the silty, fine sand and will be present at the bottom of the above-referenced excavation. The gravelly sand varies in thickness from 4 to 17 feet. The average thickness, however, is approximately 6 feet. Fly ash and bottom ash will be placed on top of the gravelly sand. At closure the fly ash and bottom ash will be covered to a depth of 3 feet using the topsoil and proposed cover material removed from the borrow lanes.

Fill slopes of the Landfill are designed to ensure the stability of the disposal area. Fill incorporates overall slopes of 3 horizontal to 1 vertical with 35 foot wide benches at 20 foot lifts. Benches will be sloped to the north and west diverting runoff from the Landfill to a retention pond at the northwest corner of the Landfill.

5.5 Borrow Areas

Cover material will be derived from the following locations:

1. Excavations made at the Landfill base as development progresses. Excavated cover material that is not used as it is excavated will be stockpiled until it is needed.
2. Stockpiles of material previously excavated from the Landfill base.
3. A borrow area located west of the Landfill and north of Evaporation Pond A.

5.6 Access and Site Control

The entire NVPP is surrounded by an 8 foot chain link and/or barbed wire fence. Access to and within the North Valmy Power Plant Landfill is controlled at all times from the main entrance of the North Valmy Power Plant Facility. Only NV Energy personnel and Subcontracted Landfill Operator are allowed onto the landfill. Visitors and other subcontractors not contracted to the Landfill are accompanied by NV Energy personnel.

5.7 Waste Stream Characterization

Waste Characterization is discussed in detail in Section 4.0, Solid Waste Characterization.

5.8 Protection of the Waters of the State

The NVPP Landfill is designed and will be operated to protect the waters of the state from degradation by pollutants or contaminants. This section demonstrates that the landfill design is sufficient to meet these requirements.

In addition to protective elements incorporated into the design, there are several physical aspects associated with the Landfill that also contribute to the protection of waters of the State. These items include:

1. The nature of the waste stream (see Section 4.0) is such that there is no potential for leachate generation due to waste decomposition.
2. There are surface water controls incorporated into the bench design to efficiently transmit meteoric water off of the landfill.
3. There is a relatively continuous and low hydraulic conductivity layer between the bottom of the Landfill and groundwater (ASW, 2013) This layer will inhibit the downward migration of fugitive liquids in the unlikely event that they occur, and;
4. The semi-arid climate results in minimal potential for meteoric water percolation into the waste to create leachate, see Hydrus Modeling results presented in the Engineering Design Report (ASW, 2013).

Additionally ten years of groundwater monitoring data indicate that in the over 30 years that the facility has been in operation there have been no impacts to groundwater (SWS, 2012a and 2012b).

5.8.1 General Geologic and Hydrologic Setting

The general geologic and hydrologic settings are presented in the Revised Groundwater Monitoring Plan (SWS, 2012a).

5.8.4 Field Investigations

Field investigations at the Landfill Site consist of borings advanced in support of the groundwater monitoring program and borings advanced in support of investigating the geotechnical characteristics of the Site's subsurface soils.

Groundwater Monitoring Borings

Three wells were drilled in close proximity to the Landfill in 1994. One well (LF-1) was drilled up gradient and two wells were drilled down gradient (LF-2 and LF-3). Because of LF-2 and LF-3 becoming dry and in order to expand monitoring well coverage, two additional wells (designated LF-4 and LF-5) were drilled in 2001. LF-4 is located to the southwest of the landfill and LF-5 to the northeast. Replacement wells LF-1R, LF-2R and LF-3R were drilled in 2009, at which time LF-1, LF-2 and LF-3 were plugged and abandoned. Replacement

well LF-4R was drilled in 2011, at which time LF-4 was plugged and abandoned. Additional details regarding the groundwater monitoring borings are presented in the Revised Groundwater Monitoring Plan (SWS, 2012a).

Geotechnical Borings

Four borings were advanced in January of 2012 to assist in determining the geotechnical aspects of the soils underlying the Landfill. Two borings were advanced through existing ash and into the natural soils and two borings were advanced adjacent to the Disposal Boundary. In-situ testing was performed to assist in determining the consistency of the in-place soils. Representative samples were obtained and transported to the ASW laboratory for testing. Additional details regarding the geotechnical investigation are presented in the Engineering Design Report (ASW, 2013).

5.8.5 Leachate Production

The potential for the landfill to generate leachate was evaluated using the HYDRUS 2D model as presented in the Engineering Design Report (ASW, 2013).

The modeling predicts very low drainage (leachate generation) potential. The low leachate generation potential coupled with the low hydraulic conductivity layer present beneath the site indicates that there is little to no potential for leachate to impact groundwater.

The modeling report text and output are presented in the Engineering Design Report (ASW, 2013).

5.9 Surface Water Control

Pursuant to NAC 444.6891, the final cover on the top deck of the Landfill will have a minimum grade of three percent to promote run-off off the top deck and to the benches. Runoff that is collected on the benches is transmitted to collection channels at the north end of the Landfill. The collection channels transmit the runoff off of the Landfill to channels at the base of the landfill which empty into a retention pond northwest of the Landfill.

The natural topography surrounding the Landfill is such that run-on controls are not required.

Additional details and supporting calculations are provided in the Engineering Design Report (ASW, 2013).

5.10 Cover Material

Final cover will be applied when any portion of the uppermost layer of waste is completed, will be a minimum of three feet thick and composed of previously excavated native soil derived from the borrow areas discussed in Section 5.5. The final cover will be sloped and graded to prevent erosion and deterioration of the final cover. A native vegetation seed mix will be dispersed upon completion of the final cover. Final cover integrity will be maintained throughout the life of the NVPP through quarterly inspections. Quarterly inspections will consist of visual inspection of the cover by NVPP environmental and/or engineering personnel to ensure that the cover material has not eroded and that slopes are graded to enhance run-off.

Site specific modeling has been conducted and has conclusively demonstrated that no leachate will degrade any waters of the state. Furthermore, the modeling has demonstrated that once buried the disposed waste is unlikely to create an environmental hazard or threaten the health of the general public.

6.0 WATER QUALITY MONITORING (NAC 444.741)

This section has been deleted in its entirety and is replaced with the Revised Groundwater Monitoring Plan and Updated Statistical Analysis prepared by Schlumberger Water Services. These two documents are presented in the Facility Operating Plan.

7.0 LANDFILL OPERATION (NAC 444.684)

This section has been deleted in its entirety and replaced with the Facility Operating Plan.

8.0 CLOSURE PLAN (NAC 444.6895)

Final closure of the Class III landfill will occur when the landfill has reached its maximum disposal capacity or when the NVPP has discontinued its operation, whichever occurs first. However, NV Energy reserves the right to amend its Class III landfill capacity if it needs to continue operation of the NVPP beyond the current permitted volume or expected life.

8.1 Actions

- At least 15 days before beginning the closure of the Class III landfill NVE shall provide notice to the solid waste management authority of the intent to close the unit.
- NVE shall begin activities for the closure of the Class III landfill unit no later than 30 days after the date on which the unit received the final receipt of wastes or, if the unit has remaining capacity and there is a reasonable likelihood that the unit will receive additional wastes, no later than 1 year after the most recent receipt of wastes. If deemed necessary, NVE may apply for an extension beyond the 1-year deadline if the landfill has the capacity to receive additional waste, in accordance with NAC 444.6892, item 2.
- NVE shall complete activities for the closure of the Class III landfill in accordance with the plan for closure within 180 days after the beginning the closure, unless the closure process is judged to require more than 180 days, in which case NVE will apply for an extension of the period for closure.
- After the closure of the Class III landfill, NVE shall notify the solid waste management authority that a certification, signed by an independent licensed professional engineer and approved by the solid waste management authority verifying that closure has been completed in accordance with the plan for closure has been placed in the operating record of the site.

In accordance with NAC 444.6893 (Requirements after closure of all municipal solid waste landfill units within Class I site), after the closure of the Class III landfill NVE shall:

- (a) Record a notation that complies with the requirements of subsection 2 on the deed to the property on which the site is located or on any other instrument which is normally examined during a title search; and
- (b) Notify the solid waste management authority that the notation has been recorded and a copy of the notation has been placed in the operating records of the site.

The notation on the deed or other instrument must in perpetuity notify any potential purchaser of the property that:

- (a) The land has been used as a landfill; and
- (b) Its use is restricted in accordance with NAC 444.6896.

8.2 Final Cover

Final cover will be applied when any portion of the uppermost layer of waste is completed. The final cover will consist of a minimum of three feet of previously excavated overburden soils. The lower one (1) foot of the final cover will be compacted. The final cover will extend a minimum of five feet past the edges of the landfill. Surfaces will be sloped away from the middle with top slopes having a minimum three percent slope, as specified by NAC 444.6891, subsection 3. A native seed mix will be applied to the final cover to naturally revegetate the final cover.

Final cover integrity will be maintained throughout the life of the NVPP through quarterly inspections. Quarterly inspections will consist of visual inspection of the cover by NVPP environmental and engineering personnel to ensure that the cover material has not eroded.

9.0 POST-CLOSURE PLAN (NAC 444.6896)

The post-closure period for the landfill will last a minimum of thirty years after closure of the site, in accordance with NAC 444.6894, subsection 1, or until the State of Nevada agrees that post-closure criteria have been met. In addition, the site will be maintained for as long after closure as the North Valmy Power Plant is operational after the minimum closure period expires.

9.1 Inspections

The operator is required to maintain the integrity and effectiveness of the final cover (NAC 444.6894, subsection 1a) through a program of inspection and maintenance.

After closure, the landfill site will be inspected quarterly by NVE environmental and/or engineering personnel to examine the integrity of the final cover. Any erosion to a depth of 3 to 6 inches will be repaired by filling with soil within one week. Any erosion to a depth of greater than 6 inches will be mitigated by construction of diversion structures and sediment traps within one week. Permanent repairs will be completed within one month of those mitigation measures. In the event of a large storm carrying high winds and/or heavy precipitation, the landfill site will be inspected and repairs will be made in a timely manner after the event.

9.2 Ground water Monitoring

A groundwater monitoring system has been established for the Landfill described in the Revised Groundwater Monitoring Plan presented in the Facility Operating Plan.

Under this monitoring program, a range of water quality and chemical parameters will be measured semi-annually during the period of operations of the landfill and for 30 years after its closure.

NVE will sample the groundwater in monitoring wells on a semi-annual basis, as outlined in the Revised Groundwater Monitoring Plan (SWS, 2012a and 2012b) for at least a period of 30 years, or until the site is deemed by NDEP-BWM to have met post-closure criteria. This sampling regime will be performed to demonstrate that no landfill leachate is being released to the underlying aquifer during the post-closure period.

The landfill groundwater monitoring plan (SWS, 2012a and 2012b) specifies assessment and corrective procedures during the long-term monitoring of the groundwater system underlying the Class III landfill. The relevant information is contained in that document in chapters:

- 6 (Detection monitoring protocols)
- 7 (Assessment monitoring)
- 8 (Corrective measures)

9.3 Maintenance

Maintenance of the landfill site will occur on an as needed basis immediately after quarterly inspections. Access roads will be repaired on an as needed basis. Missing, broken, or unreadable signs will be replaced after quarterly inspections. Final cover will be repaired immediately after it is found to have been eroded or its integrity has been otherwise degraded.

9.4 Post-Closure Land Use

Post-closure land use will be limited to normal pasture/grazing practices. No other form of land use will be allowed on the site for an indefinite period of time. After closure, the soil will not be worked in any way except for purposes of repairing final cover, drainage channel, roads, or signs.

10.0 SUMMARY AND CONCLUSIONS

North Valmy Power Plant Landfill is in an arid climate (approximately 8.10 inches annual precipitation). HYDRUS 2-D model output indicates that most precipitation is removed from the soil through evapotranspiration. Precaution was taken to assure that leachate generation by the landfill and moisture addition to the landfill were conservatively over-estimated.

There is 76 to 129 feet of alluvial soils between the bottom of the landfill and first encountered groundwater. Within these soils is a relatively continuous and low hydraulic conductivity layer.

The fly ash and bottom ash that is disposed in the landfill have been utilized at NVPP under the arid conditions of the area; and therefore, the wastes contain little moisture.

In short, moisture is adequately deterred from infiltrating the landfill. Arid conditions prevent moisture from infiltrating the cover material. Fly ash and bottom ash have no hazardous constituents; therefore, the waste has a limited capability of leaching hazardous compounds into the aquifer. In addition, a minimum of 76 feet of natural underlying soils provide a barrier inhibiting leachate infiltration into the aquifer. There is no reasonable potential for migration of pollutants or contaminants from the site to waters of the state; and, the site is unlikely to create an environmental hazard or threaten the health of the general public.

It should also be noted that fly ash and bottom ash are specifically deemed non-hazardous by CFR261.4 (b) (4) also known as the Beville Amendment.

11.0 References

Applied Soil Water Technologies, LLC., 2013, NV Energy, Engineering Design Report, Permit SW174R02 Modification, North Valmy Power Plant, June 2013

Bear Engineering Civil Engineering and Surveying, 2012. NV ENERGY, North Valmy Power Plant Landfill Volume Report 100812. October, 2012.

CH2M HILL, Phase I Environmental Assessment for North Valmy Power Generating Station, prepared for Sierra Pacific Power Company, 1998

Class III Landfill Application, Hawthorne Army Depot, 1997

Code of Federal Regulations Titles 29, 40 and 49.

Nevada Administrative Code, Chapter 444

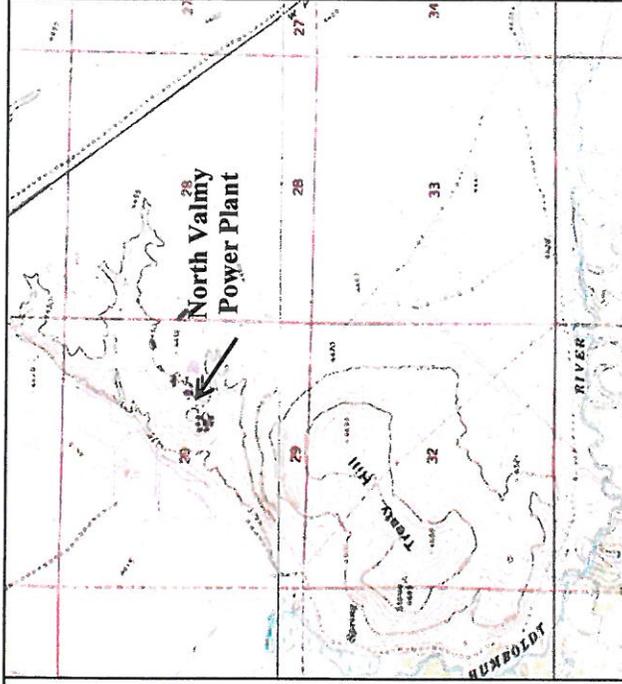
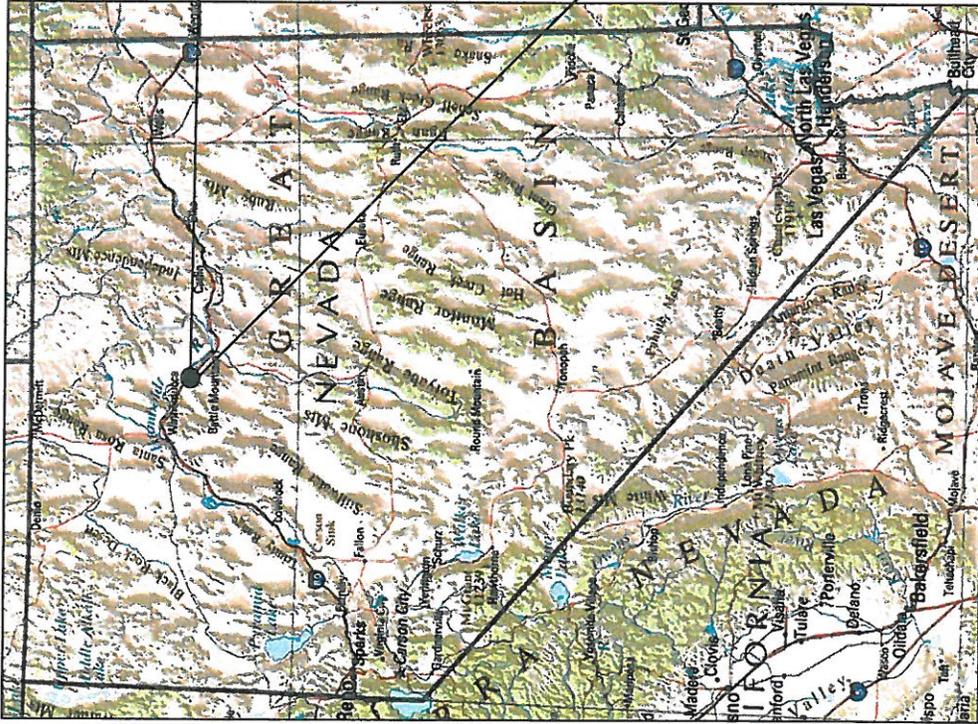
Schlumberger Water Services (SWS), 2012a. NV ENERGY, North Valmy Power Plant Revised Groundwater Monitoring Plan. Report Nr. 051729.R. December, 2012.

Schlumberger Water Services (SWS), 2012b. NV ENERGY, North Valmy Power Plant Updated Statistical Analysis. Report Nr. 051729.R. December, 2012.

Stewart, J.H. and Carlson, J.E., Geologic Map of Nevada 1978

United States Department of Agriculture, Natural Resources Conservation Service, Soil Data – Valmy Area, Not Published.

Figure



NV Energy
 Valmy Class III Landfill
 Humboldt County, Nevada

Figure 1
 Location Map



Applied Soil Water Technologies, LLC
 58 Coney Island Drive
 Sparks, Nevada 89431
 Ph: 775.284.5500 Fax: 775.284.5504
 www.appliedsoilwater.com

Appendix A

GRANT, BARGAIN AND SALE DEED

THIS INDENTURE made this 5th day of September
one thousand nine hundred and seventy five, between _____
MALCOLM McLEAN and MARGUERITE A. McLEAN, husband and wife
the parties of the first part,
and SIERRA PACIFIC POWER COMPANY, a Nevada corporation, the
party of the second part,

W I T N E S S E T H:

That the said parties of the first part, in consideration
of the sum of ten (\$10.00) dollars lawful money of the United
State of America, to them in hand paid by the said
party of the second part, the receipt whereof is hereby acknow-
ledged, do _____ by these presents grant, bargain, and sell
unto the said Party of the second part, and to its heirs and
assigns forever, all that certain lot, piece or parcel of land
situate in the County of Humboldt, State of Nevada, and bounded
and described as follows, to wit:

The Southeast one-quarter (SE $\frac{1}{4}$) of Section 32, T35N R43E
MDB&M.

TOGETHER with the tenements, hereditaments, and appur-
tenances thereunto belonging or appertaining, and the revision
and revisions, remainder and remainders, rents, issues, and
profits thereof.

TO HAVE AND TO HOLD the said premises, together with the
appurtenances, unto the said party of the second part, and to
its heirs and assigns forever.

IN WITNESS THEREOF the said parties of the first part have
hereunto set their hand this day and year first above
written.

Malcolm McLean
MALCOLM McLEAN
Marguerite A McLean
MARGUERITE A McLEAN

Mail tax statement to: P. O. Box 10110
Sierra Pacific Power Co.
Reno, Nevada 89510

MEMORANDUM OF AGREEMENT

The undersigned have this 12th day of December, 1978, entered into a formal written agreement with each other covering their mutual promises, obligations and covenants touching and concerning the following described real property and improvements located in Humboldt County, State of Nevada, more particularly described as follows:

Sections 20, 21, 22, 27, 28, 29, 32, 33 and 34, Township 35, North Range 43 East M.D.B.&M.

Any person seeking information with respect to those promises, obligations and covenants may have that information by inquiring at the office of the President of Sierra Pacific Power Company, 100 East Moana Lane, Reno, Nevada.

IDAHO POWER COMPANY

SIERRA PACIFIC POWER COMPANY

By James E. Bruce
James E. Bruce
President

By Joe L. Gremban
Joe L. Gremban
President

STATE OF NEVADA)
COUNTY OF Washoe) ss.

On this 12th day of December, 1978, personally appeared before me, a Notary Public JOE L. GREMBAN, President of Sierra Pacific Power Company, who acknowledged to me that he executed the within instrument on behalf of Sierra Pacific Power Company.

STATE OF NEVADA)
COUNTY OF Washoe) ss.

John Madariaga
Notary Public
JOHN MADARIAGA
Notary Public - State of Nevada
Washoe County
My Commission Expires Dec. 4, 1982

On this 12th day of December, 1978, personally appeared before me, a Notary Public, JAMES E. BRUCE, President of Idaho Power Company, who acknowledged to me that he executed the within instrument on behalf of Idaho Power Company.

Sierra Pacific Power Co.

1 JAN 5 P 4: 12
144 541
269905

John Madariaga
Notary Public
JOHN MADARIAGA
Notary Public - State of Nevada
Washoe County
My Commission Expires Dec. 4, 1982

GRANT, BARGAIN AND SALE DEED
AND
BILL OF SALE

THIS INDENTURE, made this 27th day of January,
1981, between SIERRA PACIFIC POWER COMPANY, a Nevada corpora-
tion, Grantor, and IDAHO POWER COMPANY, a corporation,
Grantee,

WITNESSETH:

THAT Grantor, in consideration of the sum of TEN DOLLARS (\$10.00), lawful money of the United States, the receipt of which is hereby acknowledged, and other good and valuable consideration, does grant, bargain, sell and convey to Grantee, its successors and assigns, an undivided one-half interest as a tenant in common in all that certain property situate in the Counties of Humboldt and Lander, State of Nevada, subject to the terms, conditions and covenants set forth in that certain Agreement dated December 12, 1978, between Idaho Power Company and Sierra Pacific Power Company covering the North Valmy Power Plant Project, a Memorandum of which is recorded with the County Recorder of Humboldt County at Book 144, Page 541, and more particularly described as follows:

PARCEL 1:

All that real property situate in the County of Humboldt, State of Nevada, and more particularly described as follows:

TOWNSHIP 34 NORTH, RANGE 43 EAST, MDB&M
Section 3: All.
Section 4: All.
Section 5: All.

TOWNSHIP 35 NORTH, RANGE 43 EAST, MDB&M
Section 34: South one-half of the Southwest one-

PARCEL 2:

All that real property situate in the County of Humboldt, State of Nevada, bounded and described as follows:

TOWNSHIP 34 NORTH, RANGE 43 EAST, MDB&M
Section 16: West one-half of East one-half (W1/2 E1/2).

PARCEL 3:

D10-39
All that real property situate in the County of Humboldt, State of Nevada, and bounded and described as follows:

The Southeast one-quarter (SE1/4) of Section 32, T35N R43E MDB&M.

PARCEL 4:

All that certain real property situate in the County of Humboldt, State of Nevada, to-wit:

The Southwest one-quarter of the Northwest one-quarter (SW1/4 NW1/4) and the West one-half of the Southwest one-quarter (W1/2 SW1/4) of Section 32, T35N R43E MDB&M.

EXCEPTING THEREFROM all mines of gold, silver, copper, lead, cinnabar and other valuable minerals which may exist in property described on the front page of the Deed as contained in the Patent from the State of Nevada, recorded July 26, 1951, in Book 67 of Deeds, Page 469 as Document No. 85639, aforesaid records.

PARCEL 5:

All that real property situate in the County of Humboldt, State of Nevada, bounded and described as follows:

All of Sections 21, 29 and 33, Township 35 North, Range 43 East, Mount Diablo Base and Meridian, County of Humboldt, State of Nevada, according to the official Plat thereof.

EXCEPTING THEREFROM that portion of said property lying below a depth of five hundred (500) feet measured vertically from the contour of the surface thereof; provided, however, that Grantor, its successors and assigns shall not have the right for any purpose whatsoever to enter upon, into or through the surface of the property granted herein or any part thereof lying between said surface and five hundred (500) feet below said surface.

Railway Company, a corporation, by Deed dated November 27, 1908, Recorded January 21, 1909 in Book 44 of Deeds, at Page 276, the center line of which is described as follows:

Beginning at a point in the West line of said Section 21, said point being distant South, along said West line, 1026.80 feet, more or less, from the Northwest corner of said Section 21; thence running South $34^{\circ}21'00''$ East 5166.30 feet, more or less, to a point on the South line of said Section 21, said point being distance East, along said South line 2884.20 feet, more or less, from the Southwest corner of said Section 21.

PARCEL 6:

All that certain property situate in the County of Humboldt, State of Nevada, and bounded and described as follows:

Mount Diablo Meridian, Nevada
TOWNSHIP 35 NORTH, RANGE 43 EAST

Section 20: All.

Section 28, Northwest one-quarter of the Northeast one-quarter (NW $1/4$ NE $1/4$), Northeast one-quarter of the Northwest one-quarter (NE $1/4$ NW $1/4$), West one-half of the West one-half (W $1/2$ W $1/2$).

Section 32: East one-half of the Northeast one-quarter (E $1/2$ NE $1/4$).

The area described contains 960 acres.

EXCEPTING AND RESERVING TO THE UNITED STATES:

1. A right-of-way thereon for ditches and canals constructed by the authority of the United States. Act of August 30, 1890, 26 Stat. 391; 43 U.S.C. 945.

2. All mineral deposits in the lands so patented, and to it, or persons authorized by it, the right to prospect, mine, and remove such deposits from the same under applicable law and such regulations as the Secretary of the Interior may prescribe.

SUBJECT TO:

1. A right-of-way for communication line purposes granted to Bell Telephone Company of Nevada, its successors or assigns, on February 11, 1915 for a period of 50 years, and renewed in 1965 for an additional 50 year period, under the Act of March 4, 1911 (36 Stat. 1253, 43 U.S.C. 961). (Elko 01655)

2. A right-of-way for railroad purposes granted to Western Pacific Railway Company, its successors or assigns, on September 15, 1910, under the Act of March 3, 1875 (18 Stat. 482, 43 U.S.C. 934-939). (CC-04518)

3. A right-of-way for railroad purposes granted to Western Pacific Railway Company, its successors or assigns, on March 1, 1907, under the Act of March 3, 1875 (18 Stat. 482, 43 U.S.C. 934-939). (CC-04690)

4. A right-of-way for power transmission line purposes granted to the Sierra Pacific Power Company, its successors or assigns, on July 27, 1978, for a period of 48 years, under P.L. 94-579 (October 21, 1976), Title V, 90 Stat. 2743. (N-7639-B).

PARCEL 7:

All that certain real property situate in the County of Lander, State of Nevada, bounded and described as follows:

TOWNSHIP 34 NORTH, RANGE 45 EAST, MDB&M.
Section 4: South one-half (S1/2).

EXCEPTING THEREFROM all oil and gas in said land as reserved in the patent from the United States of America, recorded in Book 98, Page 493 Official Records, Lander County, Nevada.

PARCEL 8:

All that certain real property situate in the County of Lander, State of Nevada, bounded and described as follows:

TOWNSHIP 34 NORTH, RANGE 45 EAST, MDB&M.
Section 30: West one-half (W1/2)

EXCEPTING THEREFROM all that certain real property being a portion of the Southeast one-quarter of the Southwest one-quarter (SE1/4 SW1/4) of Section 30, Township 34 North, Range 45 East, MDB&M, Lander County, Nevada, more particularly described as follows:

Beginning at the Southeast corner of said Southeast one-quarter of the Southwest one-quarter (SE1/4 SW 1/4); thence West 1320.0 feet along the South line of said Section 30 to the Southwest corner of said Southeast one-quarter of the Southwest one-quarter (SE1/4 SW1/4); thence Northeasterly along the arc of a curve to the left having a radius of 1320.0 feet, a central angle of 90°00' and a tangent of East, a distance of 2073.45 feet to the Northeast corner of said Southeast one-quarter of the Southwest one-quarter (SE1/4 SW1/4); thence South 1320.0 feet along the East line of the West one-half (W1/2) of said Section 30 the the point of beginning. Containing 8.584 acres, more or less.

PARCEL 9:

particularly described as follows:

The North one-half (N1/2) of Section 4, Township 34 North, Range 45 East, MDB&M.

TOGETHER with all the tenements, hereditaments, and appurtenances thereunto belonging, or appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, excepting and reserving therefrom any and all water rights appurtenant to said lands.

TO HAVE AND TO HOLD said undivided one-half interest as a tenant in common in the premises, with the appurtenances, unto Grantee and to its successors and assigns forever.

ADDITIONALLY, AND FOR VALUE RECEIVED, the Grantor does hereby sell, assign and transfer to Grantee all right, title and interest in and to an undivided one-half interest in all the Valmy Generating Station located in Humboldt County, Nevada, in accordance with that certain Agreement for the Ownership of the North Valmy Power Plant Project between Idaho Power Company and Sierra Pacific Power Company dated December 12, 1978.

IN WITNESS WHEREOF, Grantor has caused this instrument to be executed the day and year first above written.

SIERRA PACIFIC POWER COMPANY

By Joe L. Gremban
Title President

ATTEST:

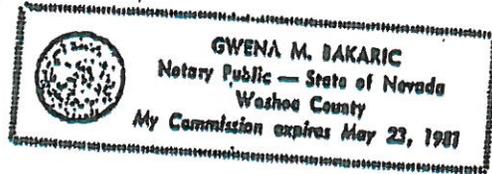
J. R. Anderson
Secretary

STATE OF NEVADA)
) ss.
COUNTY OF WASHOE)

On this 27th day of January, 1981, personal:
appeared before me, a Notary Public, JOE L. GREMBAN
known to me to be the President of SIERRA PACIFIC
POWER COMPANY, who acknowledged to me that he executed the
within GRANT, BARGAIN AND SALE DEED AND BILL OF SALE on
behalf of SIERRA PACIFIC POWER COMPANY.

Gwena M. Bakaric

Notary Public



OFFICIAL RECORDS
HUMBOLDT CO., NEVADA
RECORDED AT REQUEST OF
Sierra Pacific Power

81 JAN 27 AIO: 27

145-422
EVELYN JOHNSON
COUNTY CLERK
JAN 6 1981 INDEXED

Appendix B

Appendix C

Responsibility Statement

The findings, design, and recommendations presented in this *Permit Modification Application for NV Energy's, North Valmy Power Plant, Class III Landfill, Humboldt County, Nevada* were prepared in accordance with the degree of professional care, prudence and skill of a nationally recognized, properly licensed, professional firm.

We trust this information suits your current need. If you have any questions or would like to discuss this report in more detail, please do not hesitate to contact us at (775) 284-5500.

Sincerely,

Applied Soil Water Technologies, LLC



Robert B. Valceschini, P.E.
Principal/Senior Engineer