Planning Commission Staff Report

Meeting Date: September 1, 2020 **Agenda Item: 8B**

SPECIAL USE PERMIT CASE NUMBER: WSUP20-0013 Ormat Geothermal

BRIEF SUMMARY OF REQUEST: Special use permit for renewable energy production, utility services, hazardous materials, major grading and to vary parking, landscaping, and grading standards.

STAFF PLANNER: Planner's Name: Dan Cahalane, 775.328.3628, dcahalane@washoecounty.us

CASE DESCRIPTION

For possible action, hearing, and discussion to approve a special use permit for 1) the establishment of an Energy Production, Renewable use type including two 24MW geothermal power plants, 2) the establishment of a Hazardous Materials use, in the form of 720,000 lbs. of flammable pentane gas (a refrigerant) for use as a turbine working fluid, 3) major grading for 194.9 acres of ground disturbance, including 300,000cy of excavation, for well pads and access roads and 4) a 120kV power transmission line that extends ±21.6 miles over 20 parcels. The application also requests to vary landscaping, parking, and grading standards by waiving all landscaping requirements, waiving the paved parking requirement, and allowing grading height differentials of greater than 10ft from natural grade. This project meets the standard for a project of regional significance, because it will generate more than 5 MW of electricity, require construction of 2 substations, and require the construction of a new transmission line and will require approval by the regional planning authorities before any approval at the county level would take effect. The two substations will be located on APNs 071-070-13 and 071-030-06. This project also requires recommendation to amend to the Regional Utility Corridor Map from the Board of County Commissioners. This project will also need to comply with all Federal and State approvals before any approval at the county level would take effect.

Applicant:	Orni 36, LLC
Property Owners:	Ceresola Brothers, LLC; GM Gabrych Family LTD PTSP; Kosmos Company; New Nevada Lands LLC; United States of America; US Geothermal Inc
Location:	Well Heads – approximately 10 miles north of Pyramid Lake Transmission Line – approximately 10 miles east of the southern tip of Pyramid Lake south to the border of Washoe County
APN:	Transmission Line - 079-180-02, 079-180-12, 079-180-45, 079-570-01, 079-570-07, 079-570-13, 079-320-12, 079-320-18, 079-320-04, 079-170-39, 079-180-34, 079-180-37, 079-180-44, 079-320-42, 079-320-47, 079-320-52, 079-320-55, 079-570-02, 079-570-06, 079-570-12 Power Generation - 071-070-13, 071-030-06 Wells and Well Pads - 071-030-07, 071-060-18, 071-070-09, 071-070-12, 071-070-16, 071-070-18, 071-070-19, 079-170-02
Parcel Size:	Varies. Affected area: 189.9 acres
Master Plan:	Rural
Regulatory Zone:	General Rural
Area Plan:	High Desert/Truckee Canyon
Citizen Advisory Board:	Gerlach/Empire and East Truckee Canyon
Development Code:	Authorized in Article 302, 324, 438, 810, 812
Commission District:	5 – Commissioner Herman

STAFF RECOMMENDATION

APPROVE **APPROVE WITH CONDITIONS** **DENY**

POSSIBLE MOTION

I move that, after giving reasoned consideration to the information contained in the staff report and information received during the public hearing, the Washoe County Planning Commission approve with conditions Special Use Permit Case Number WSUP20-0013 for Orni 36, LLC for the following requests 1) establishment of an Energy Production, Renewable use type, 2) the establishment of a Hazardous Materials use, 3) major grading, and 4) request to vary parking, landscaping, and grading standards as recommended in the conditions of approval in Exhibit A , having made all five findings in accordance with Washoe County Code Section 110.810.30 and the additional findings in accordance with Washoe County Code Section 110.810.35, 40, & 42:

(Motion with Findings on Page 21)

Staff Report Contents

Exhibits Contents

Special Use Permit

The purpose of a special use permit is to allow a method of review to identify any potential harmful impacts on adjacent properties or surrounding areas for uses that may be appropriate within a regulatory zone; and to provide for a procedure whereby such uses might be permitted by further restricting or conditioning them so as to mitigate or eliminate possible adverse impacts. If the Planning Commission grants an approval of the special use permit, that approval is subject to conditions of approval. Conditions of approval are requirements that need to be completed during different stages of the proposed project. Those stages are typically:

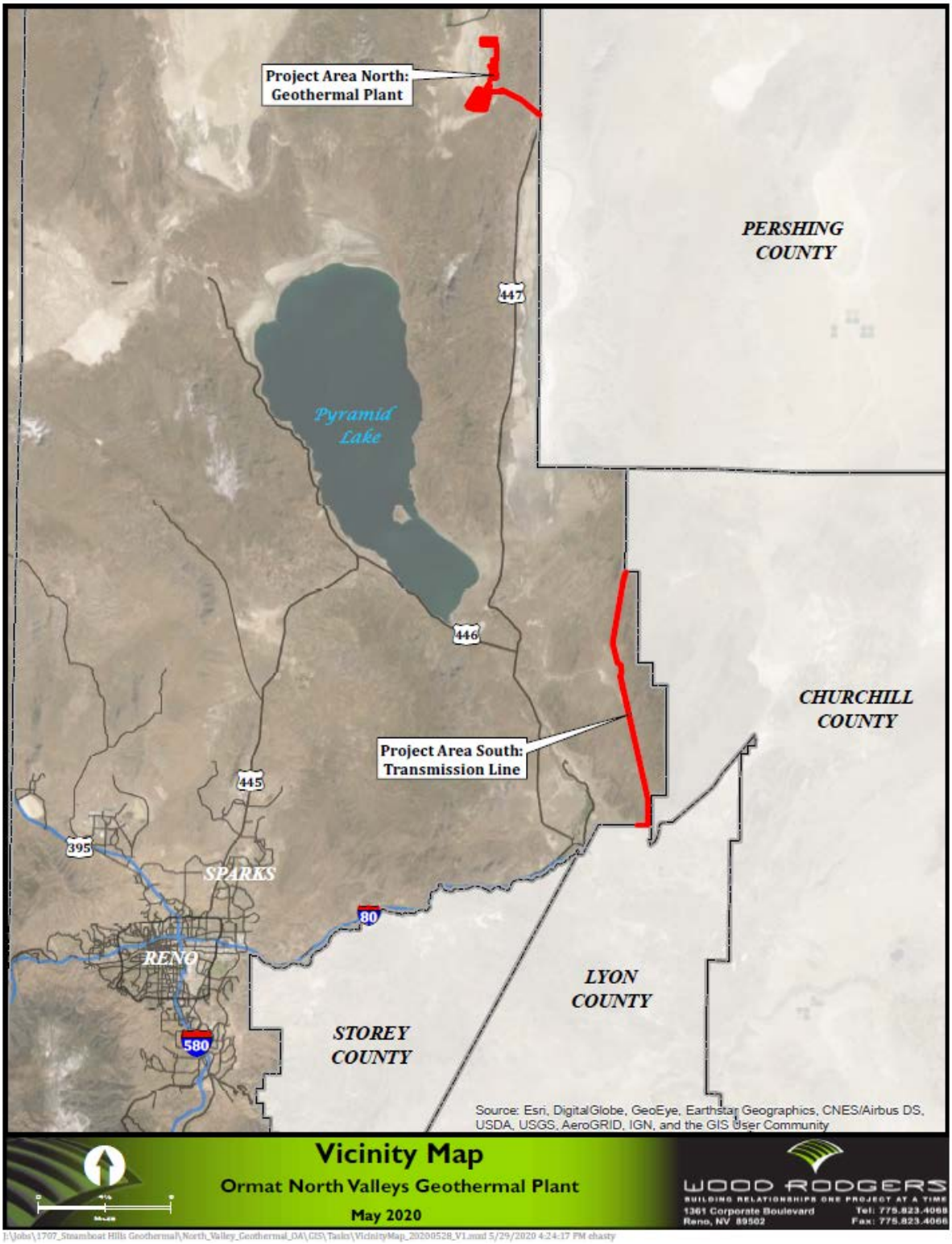
- Prior to permit issuance (i.e. a grading permit, a building permit, etc.)
- Prior to obtaining a final inspection and/or a certificate of occupancy on a structure
- Prior to the issuance of a business license or other permits/licenses
- Some conditions of approval are referred to as "operational conditions." These conditions must be continually complied with for the life of the business or project.

The conditions of approval for Special Use Permit Case Number WSUP20-0013 are attached to this staff report and will be included with the action order.

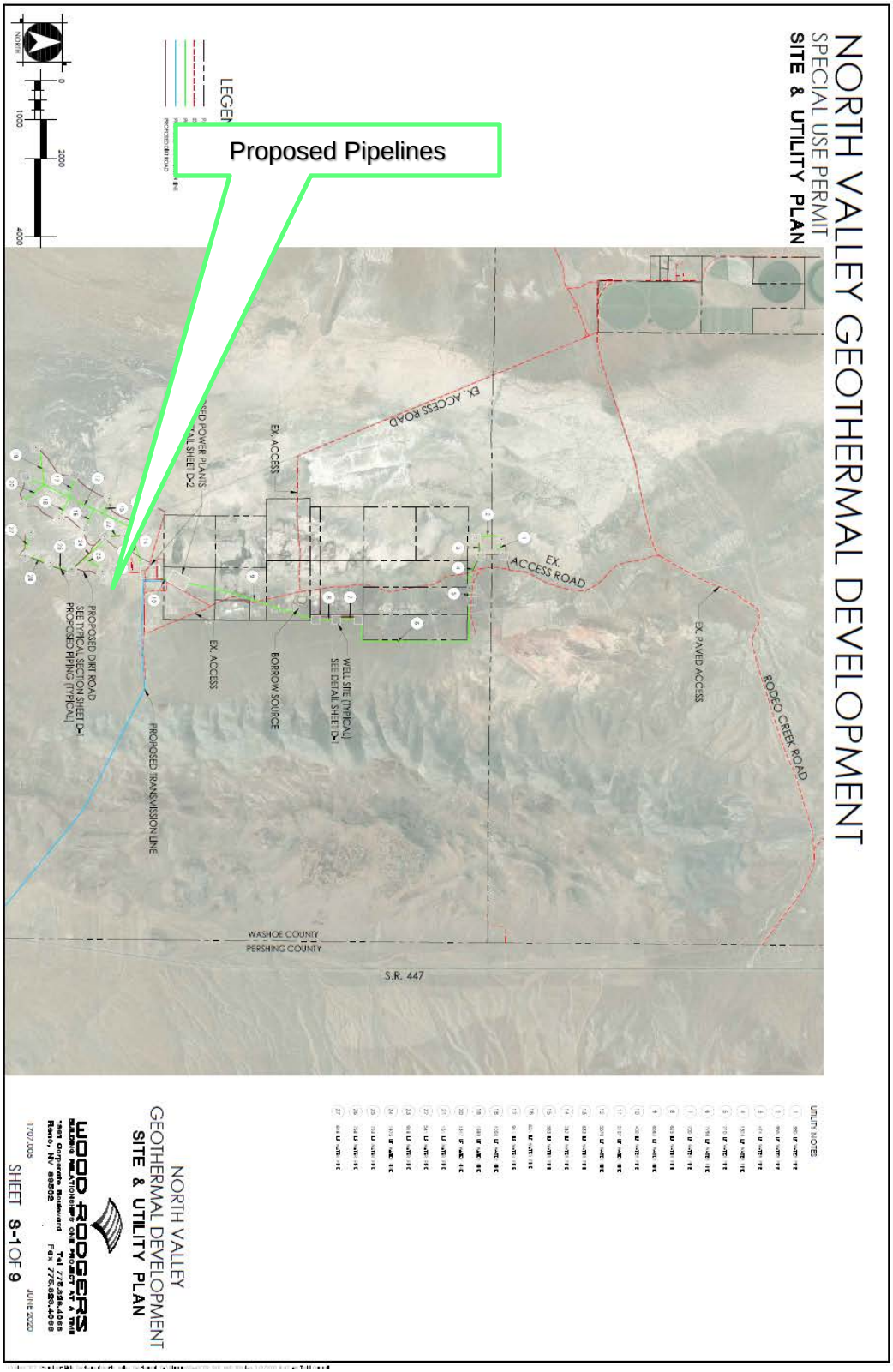
The subject property is designated as General Rural (GR). The proposed use of geothermal energy production, transmission line which is classified an energy production, renewable use, and utility services use type which are permitted in a General Rural regulatory zone with a special use permit per WCC 110.302.05.2 & 4. This facility also triggers a Hazardous Materials permit, which requires approval of an SUP per 110.810.42 by the BCC following approval by the PC. Therefore, the applicant is seeking approval of this SUP from the Planning Commission.

In addition, the SUP ordinance allows the Planning Commission to vary standards in conjunction with the approval process per WCC 110.810.20(e). The applicant is seeking a variance of

landscaping, parking, and grading requirements. The Planning Commission will also be ruling on these requests.



Vicinity Map

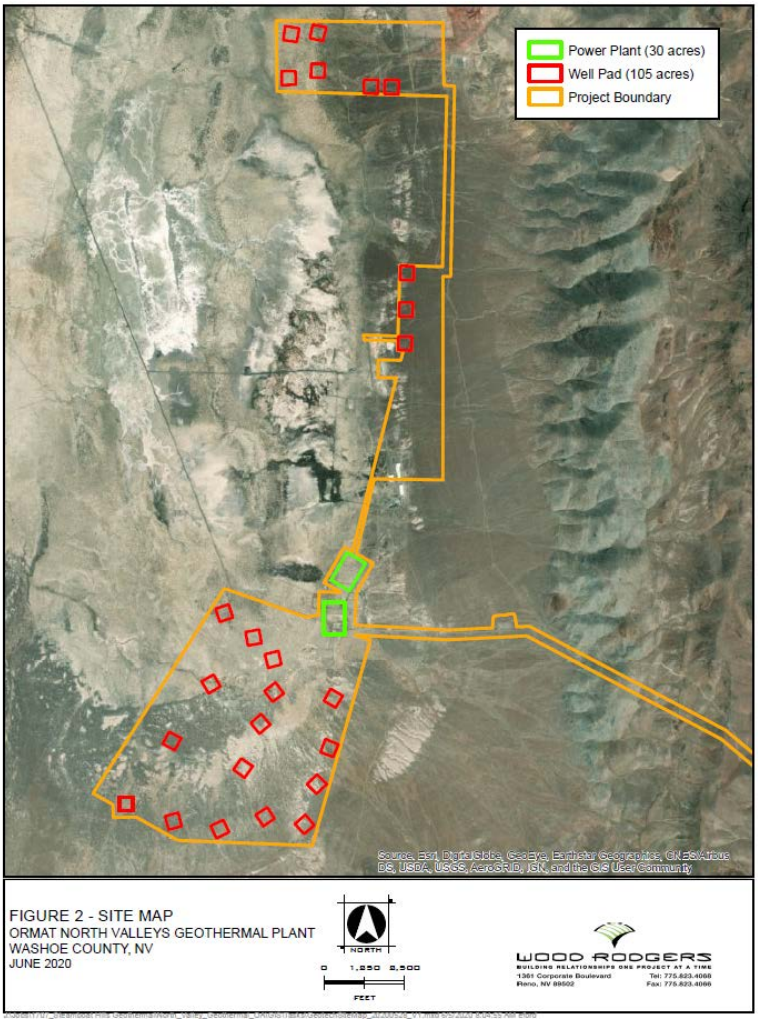

Proposed Pipelines
NORTH VALLEY GEOTHERMAL DEVELOPMENT
SPECIAL USE PERMIT
SITE & UTILITY PLAN
EX. ACCESS ROAD
EX. ACCESS
EX. ACCESS ROAD
EX. PAVED ACCESS
RODEO CREEK ROAD
BORROW SOURCE
WELL SITE (TYPICAL)
SEE DETAIL SHEET D-1
PROPOSED TRANSMISSION LINE
PROPOSED DIRT ROAD
SEE TYPICAL SECTION SHEET D-1
PROPOSED PIPING (TYPICAL)
WASHOE COUNTY
PERSHING COUNTY
S.R. 447
UTILITY NOTES
NORTH VALLEY
GEOTHERMAL DEVELOPMENT
SITE & UTILITY PLAN
WOOD RODGERS
SHEET S-1 OF 9
JUNE 2020

Site Plan

Project Background

The applicant is requesting to establish a new renewable energy production use type for: 1) two 24MW geothermal power plants and geothermal power generation, 2) a Hazardous Materials use, in the form of 720,000 lbs. of flammable pentane gas (refrigerant) for use as a turbine working fluid, and a major grading permit for 194.9 acres of ground disturbance, including 300,000cy of excavation and 100,000cy of gravel, for well pads and access roads and a 120kV power transmission line that extends ±21.6 miles over 20 parcels. The applicant is also requesting to vary the landscaping, parking, and grading standards by waiving all landscaping requirements, requiring no paved parking spaces, and proposing finished grades over 10ft from their natural state. This project is anticipated to affect 2,414 acres among these four requests. This project meets the standard for a project of regional significance, because it will generate more than 5 MW of electricity, require two 12.48kV+/- substations, and require the construction of a new transmission line.

Geothermal Site Plan



The applicant owns the existing and currently operating San Emidio geothermal facility, which is in general vicinity of the proposed geothermal sites. The proposed project is spread across 30 General Rural regulatory zone parcels located in both the High Desert and Truckee Canyon areas Area Plans. Up to 25 geothermal well pads will be spread across 8 parcels, connected by 7.6 miles of production and injection pipelines to two 24mW binary design geothermal generation facilities

located on two additional parcels. The remaining 20 parcels make up the proposed transmission line.

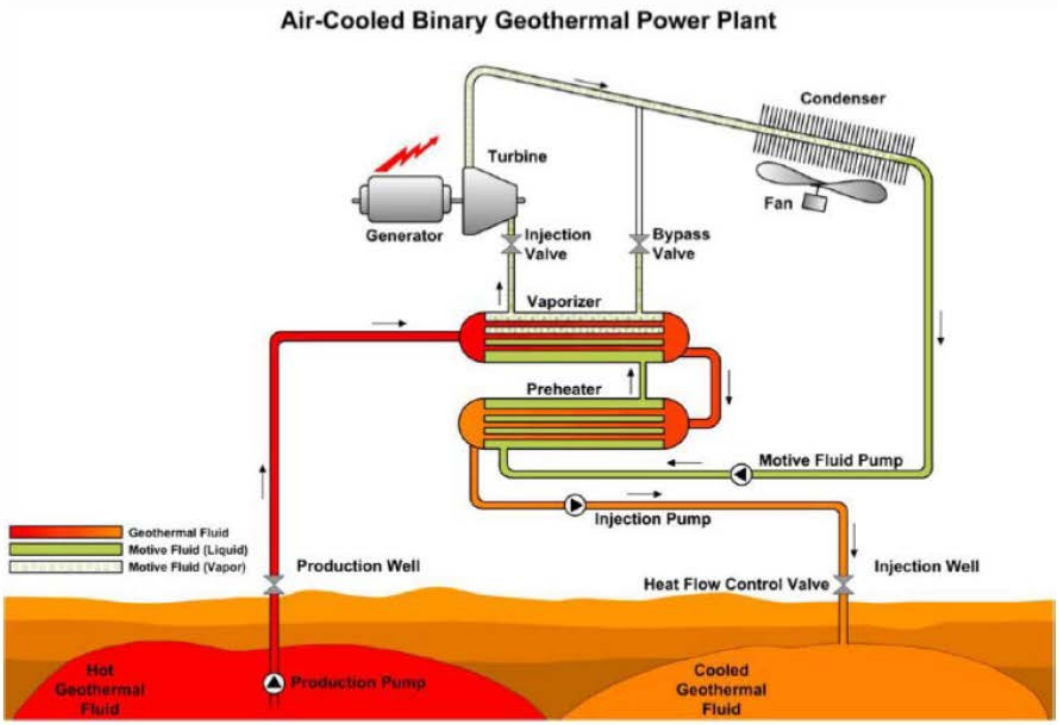


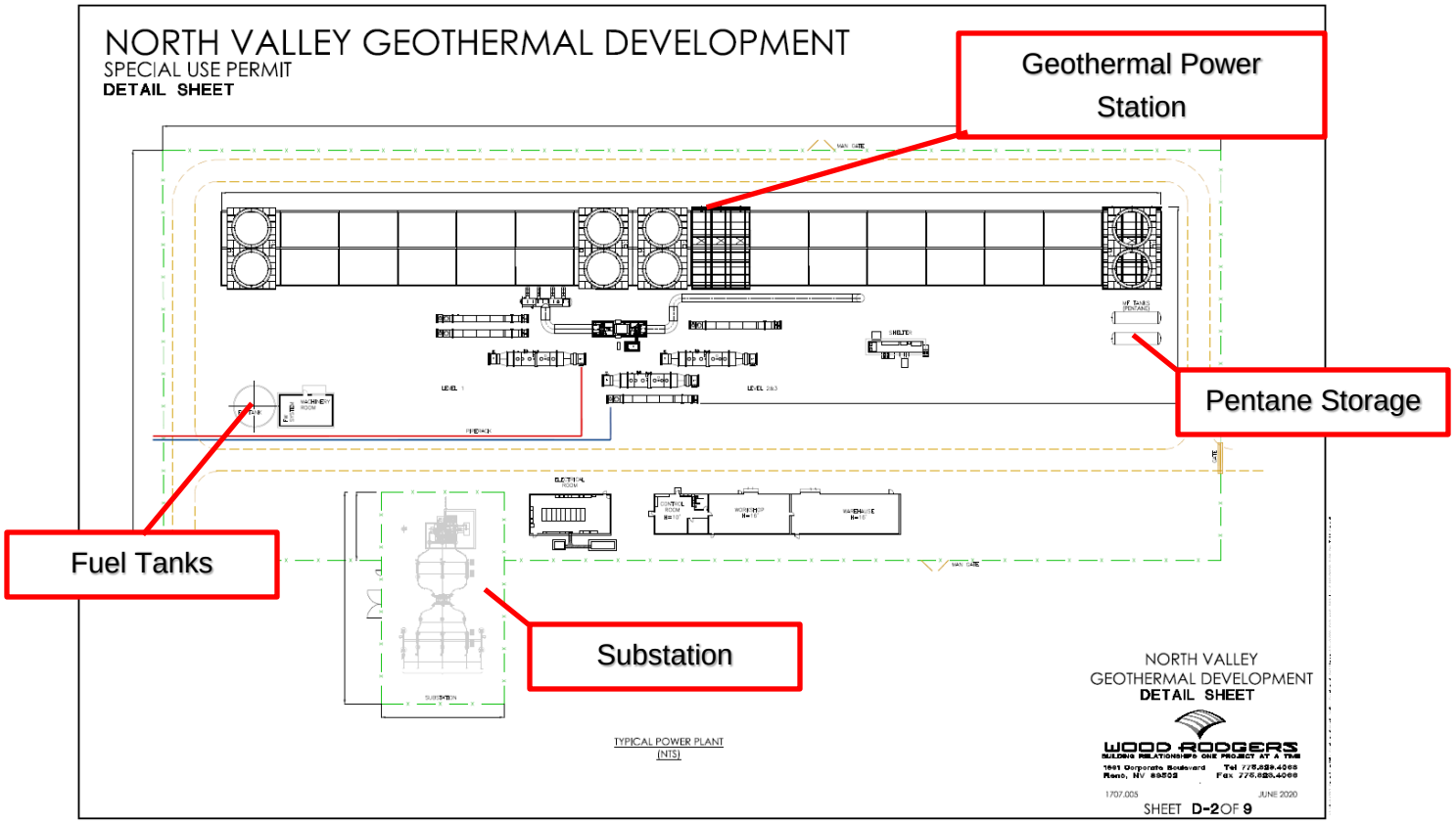
Figure 1 - Binary Plant Operations

The applicant provides a short description and diagram on how this plant design functions on page 2 of the project description below:

> *"The hot brine (geothermal fluid) is pumped up through production wells and fed into a heat exchanger. The heat from the water is absorbed by pentane, the secondary motive fluid, which is a flammable but non-toxic hydrocarbon that circulates in a closed loop. The pentane vapor is used to drive the turbine, producing electricity. The pentane is then condensed back to its liquid state using air-cooled condensers that range between 28-35ft in height. The condensed motive fluid would then be pumped back to the heat exchangers for reheating and vaporization, and the geothermal fluid is injected back into the geothermal reservoir, completing the closed cycle.*

This facility will include two 500-gallon diesel fuel and one 500-gallon unleaded gas storage tanks per plant (x2 for total project) for backup generators and fueling equipment for facility operations.

Geothermal Power Plant Site Plan



The applicant anticipated that the first geothermal power plant will take 9 months to build and the entire project will be completed within 3 years.

Article 302/304- Uses

Staff Comment: The applicant is requesting to establish a geothermal power station, install a new transmission line, and expand an existing "borrow pit" on parcels with General Rural regulatory zoning. These uses correspond with the following use types as defined in WCC article 304 and required permits per Washoe County Code tables 110.302.05.2 and 110.302.05.4, as defined below:

> Energy Production, Renewable - refers to the commercial production of energy utilizing solar, geothermal, wind, hydroelectric, and biomass sources of energy. This use is permissible in General Rural (GR) regulatory zoning with an approved special use permit.
>
> Utility Services – refers to the provision of electricity, water or other liquids, or gas, through wires, pipes or ditches through utility services involving major structures that have flexibility in location. Typical uses include natural gas transmission lines and substations, petroleum pipelines, and irrigation water ditches. This use is permissible in General Rural (GR) regulatory zoning with an approved special use permit.
>
> Aggregate Facilities - refers to the extraction and processing of sand, gravel, and rock from the ground. Typical uses include sand and gravel pit and ancillary uses such as concrete and asphalt batch plants. This use is permissible in General Rural (GR) regulatory zoning with an approved special use permit.

Article 328 – Geothermal Resources

Staff Comment: The proposed renewable energy production facility will use geothermal resources in order to generate power. This use is required to abide by the use standards outlined in Article 328 – Geothermal Resources.

WCC 110.328.10 requires that the applicant shall obtain all necessary permits from the Nevada Dept of Minerals, Nevada Department of Environmental Protection (NDEP), Nevada Department of Wildlife Resources (NDWR), Washoe County District Health (WCDH), and the Bureau of Land Management (BLM) prior to the issuance of any building permits.

Staff notes that this application does not include permits for geothermal gradient and exploration test wells. An administrative permit is required for any test permit per WCC 110.328.15. **The approval of this application does not constitute an approval of test wells.**

Geothermal wellfield gathering systems and power generation facilities are required to abide by the standards in WCC 110.328.20. Geothermal power generation facilities are allowed only within General Rural (GR) and Industrial (I) regulatory zones with approval of a Special Use Permit. The entirety of the Area of Interest (AOI) is within a General Rural (GR) regulatory zone.

Geothermal power generation facilities shall not use toxic materials in the drilling fluid per 110.328.20(b). Staff has provided conditions in in Exhibit A requiring that the county be provided a list of drilling chemicals prior to the issuance of any building permits.

Geothermal wellfield gathering system sites are required to be revegetated and returned to approximately its original condition upon abandonment. Staff has provided operational conditions in Exhibit A requiring a revegetation bond for the reclamation of the site.

Staff will review the required geothermal power generation minimum standards per WCC 110.328.20(e)1-4 in the analyses for Article 406, Article 412, and Article 414. This application was referred the Washoe County District Health Air Quality Management department to satisfy WCC 110.328.20(e)5, who provided operational conditions in Exhibit A.

Article 332 – Aggregate Facilities

Staff Comment: The applicant is requesting approval for a major grading permit including 300,000 cubic yards of excavation. According to the applicant's project description (pg. 5):

> *"As much as possible, native materials (derived from grading to balance cut and fill) will be used for site and road building materials. Approximately 100,000 cubic yards of surfacing material may be needed for energy plant and pipeline construction. Material will be obtained from an existing pit previously used for the San Emidio Geothermal Facility (located on APN 071-070-09), which is within the project area. This existing pit is anticipated to be expanded by up to five acres (refer to Plan Sheet G2)."*

This description outlines that there will be approximately 100,000cy of surfacing material will be required. Staff has determined that this description constitutes a Restricted Market Temporary Aggregate Facility use as this facility will be providing approximately 100,000cy of surfacing material on a temporary basis for this specific project as outlined in 110.332.10(b)1 and 110.332.10.(b)4. This type of aggregate facility is permissible in any regulatory zone with an approved special use permit and is only active for the life of a project. Projects requiring less than approximately 100,000cy of aggregate shall be regulated under Article 438, Grading Standards.

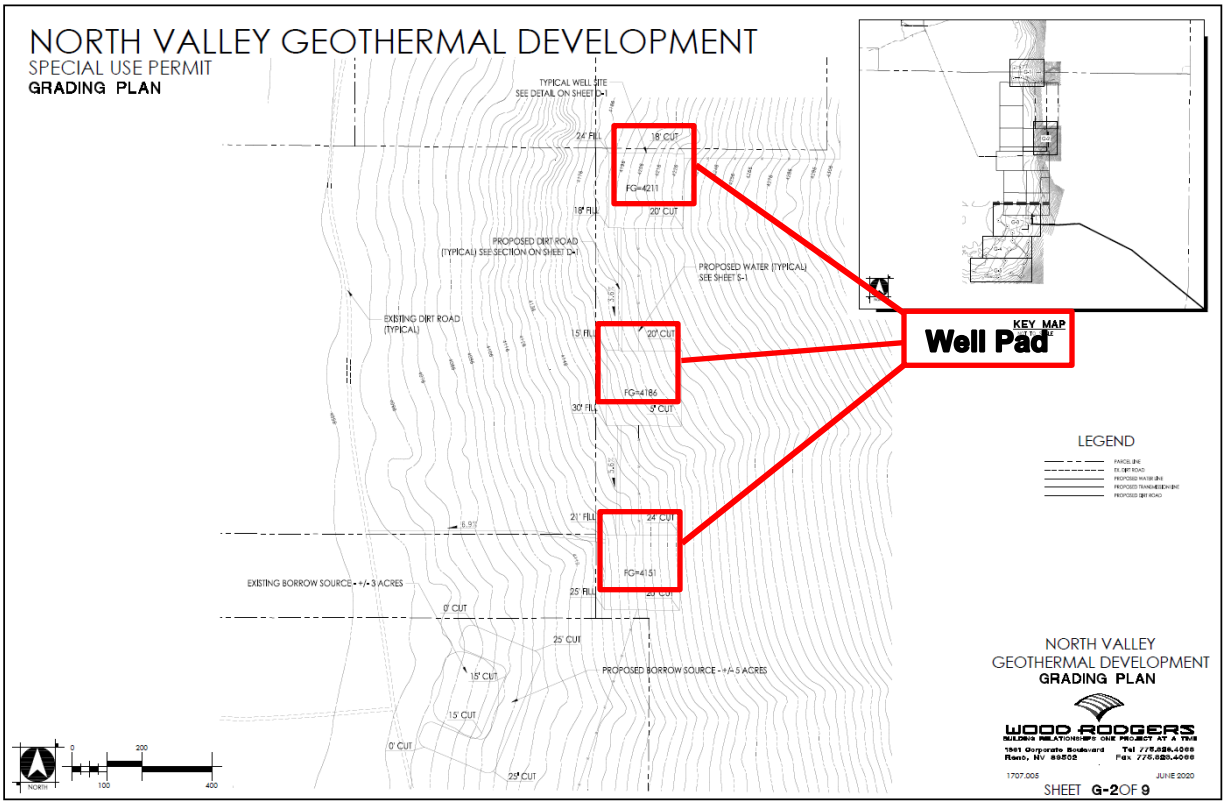
The parcel in question, APN 071-070-09, is only associated with SUP8-31-91 for a geothermal plant. Per 110.332.35, all active aggregate facilities shall comply with the provisions of Article 332 by December 31. 2011. The existing aggregate facility is currently unpermitted and therefore illegal.

The applicant will submit and complete an aggregate facility SUP prior to disturbing the pit to remove 100,000cy of aggregate material in compliance with Washoe County code.

Article 406- Building Placement Standards

Staff Comment: The applicant is proposing construction of 25 well pads and two geothermal power generating facilities. The proposed air-cooled air condensers are between 28-35ft in height. These facilities are located on General Rural (GR) regulatory zoned parcels. Structures are required to meet a 30ft front and rear yard setback and a 50ft side yard setback and 35ft height maximum in GR zoning.

Staff reviewed the plans in detail. Sheet G-2 shows the location of three well pads between 25ft and 40ft of the property line, as seen below:



Any permanent structures on in these well pads on sheet G-2 must comply with the required GR setbacks. All other well pads and structures are clearly within the setback envelope and meet the height requirements.

The applicant is proposing to install an un-slatted 8ft high fence topped with barbed wire around the perimeter of the well pads. This complies with WCC 110.406.50(b), which limits industrial fences to a maximum height of 8ft.

Article 410 – Parking and Loading Standards

Staff Comment: The proposed renewable energy production use type requires (1) parking space per employee per table 110.410.10.4, (1) handicapped accessible space per table 110.410.15.1, and (1) 25ft by 15ft loading space for every 20,000sf of gross floor area per 110.410.30(b).

The applicant anticipates that there will be a maximum of 2 employees on site at the facility during operations. This facility shall provide 3 total parking spaces in front of the power generation facilities., one of which must be a handicapped accessible space with applicable signage.

The applicant is also requesting to waive the paved parking requirement on the basis that the facility is in a rural area without paved roads. Staff agrees that the paved parking requirement does not fit the surrounding high desert environment. Staff has provided conditions in Exhibit A waiving the pavement requirement.

Article 412 – Landscaping Standards

Staff Comment: The proposed application provides no formal landscaping and the applicant is requesting to waive all of the provisions of Article 412 in accordance with 110.412.10(d) for an energy production use. The applicant specifically cites that these standards be waived to make use of native drought tolerant plants and limit the negative impact of formal landscaping within the high desert. The applicant also suggested using chain link fencing in order to limit the visual impact on surrounding properties.

Staff agrees that the required yards adjoining streets outlined in WCC110.412.45(b) do not match the character of the high desert. There are no adjacent residential uses to the proposed geothermal well pads and geothermal power plants. Therefore, the applicant is not required to provide residential screening or buffering. The applicant's request to waive the landscaping standards only applies to energy production use types. However, staff believes that requiring landscaping screening, and buffering is excessively onerous for a transmission line, which is a utility services type. Staff has provided conditions of approval in Exhibit A waiving the formal landscaping standards outlined in WCC 110.412.45(a-d). The applicant shall be required to maintain any landscaping they place on the property beyond the waived requirements in accordance with Article 412.

However, waiving the formal landscaping standards shall not exempt the applicant from the revegetation and stabilization requirements outlined in WCC 110.438.70 and 110.438.77, outlined in detail in the Article 438 section below.

Article 414 – Lighting Standards

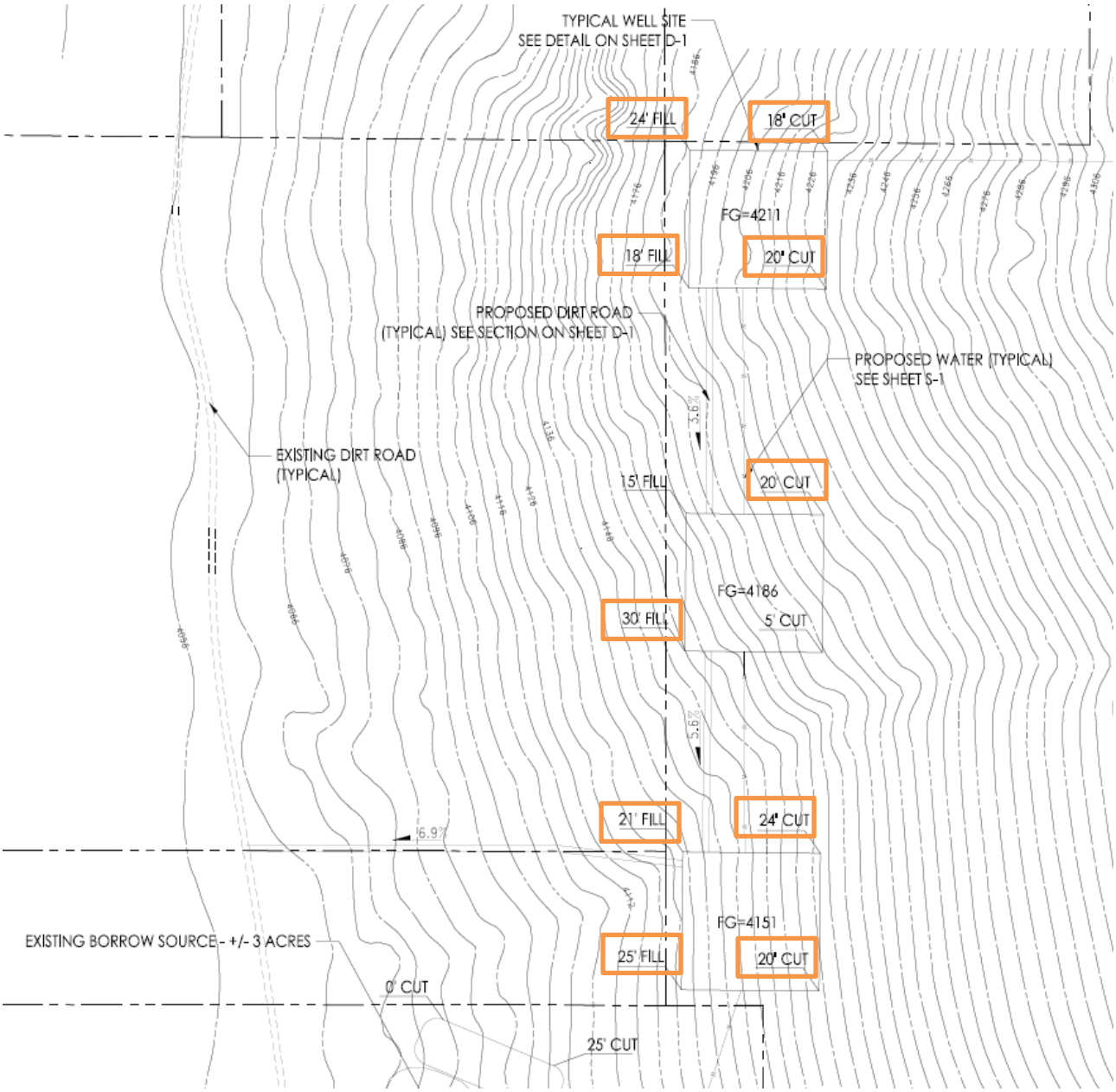
Staff Comment: The applicant is proposing that all lighting will meet dark sky standards. This conforms with the requirement that lighting facilities shall be installed to reflect away from adjoining properties and lamps must not extend below the bottom of the cover per WWC 110.414.21.

Article 438 – Grading Standards

Staff Comment: The applicant is requesting a major grading permit for 300,000cy of excavation across 194.9 acres of disturbed area in order to create up to 25 well pads and 7.6 miles of geothermal piping. The applicant is also requesting to waive the 10ft maximum finished slopes requirement per 110.438.45(c). The requested grading exceeds both the 4 acres of grading area and 5000 cy cut/fill grading thresholds for a major grading permit per 110.438.35(a)i/ii.

The applicant estimates that the well pads will initially disturb 4.2 acres per well pad (105 acres in total), and result in a final disturbance of 2.5 acres per well pad (62.5 acres). The applicant will salvage and stockpile the topsoil from each pad on the pad site in order to facilitate revegetation activities. The applicant estimates that the pipelines will require initial temporary surface grading of 36.8 acres and will result in permanent disturbance to be 18.4 acres. The applicant will reseed 60.9 acres of the disturbed area with native shrub mix.

Sheet G-2 (Zoomed in)



The applicant is requesting to vary the 10ft maximum height difference from natural grade for the entirety of this project in order to preserve flexibility in siting geothermal well pads across the site. This request is currently applicable to the well pads listed on sheet G-2 (above) which shows cuts and fills ranging from 15-30ft in height. The nature of geothermal exploration means that the placement and number of wells for this project depends on the availability of geothermal resources. This may require that some of the wells may be placed in more topographically constrained areas in order to maximize the geothermal efficiency while minimizing the required grading across the site overall through a reduction in required well pad sites. Therefore, staff agrees that waiving this standard is reasonable in order to preserve placement flexibility and potentially reduce the required

grading required. Staff has recommended conditions in Exhibit A specifying mitigating requirements for a greater than 10ft height differential.

All other slopes must comply with Washoe County Code 110.438.45, which are summarized in the table below:

Type of Regulation	Requirements			
	Front Yard	**Side Yard**	**Rear Yard**	**Setback Envelope**
Slopes	3:1	3:1	3:1	3:1
Difference from Natural Grade	Proposed to be varied. See Exhibit A.			
Retaining Wall Height	4.5ft	6ft Res/8ft non res	6ft Res/8ft non res	10ft
Retaining Wall Terrace Widths	Min. 6ft	Min. 6ft	Min. 6ft	Min. 6ft
Retaining Wall Bench Widths	Min. 4ft	Min. 4ft	Min. 4ft	Min. 4ft
Intersection Angle	45 degrees	45 degrees	45 degrees	45 degrees
Transitions	Contoured	Contoured	Contoured	Contoured

All remaining cut slopes shall be treated with a dust palliative if left undeveloped for 30 days and revegetated if left undeveloped for more than 90 days per WCC 110.438.70. All remaining disturbed areas are required to be stabilized, defined as final stabilization per WCC 110.438.25, prior to the issuance of the Certificate of Occupancy (CoO) in accordance with WCC 100.438.77.

The application was routed to the Engineering Division (memo Exhibit C), Parks and Open Space Program (memo Exhibit F) and their respective conditions are in Exhibit A. This application was also routed the Nevada Department of Environmental Protection (NDEP) for comment, who did not respond. **This does not absolve the applicant of their requirement to secure an NDEP permit in accordance with 110.438.100.**

Article 810.35 – Development of Natural Resources

Staff Comment: The proposed application qualifies as a development of Natural Resources SUP. Therefore, the following additional findings are required:

a) The proposed development is not unduly detrimental to surrounding properties, land uses, and the environment in general
b) The proposed development will not unduly block scenic views or degrade surrounding scenic resources
c) The proposed development will reclaim the site at the conclusion of the operation.

Article 810.42 – Hazardous Materials

Staff Comment: The application outlines that approximately 720,000 lbs. (360,000 lbs. per plant) of pentane gas will be used as the motive fluid in the proposed power plants. This meets the Hazardous Materials SUP threshold as outlined in WCC 110.810.42. The application was forwarded to the following additional agencies for comment in compliance with 110.810.42(b)3:

1. Washoe County Director of Emergency Management and Homeland Security
2. The Administrator of the Division of Environmental Protection of the Nevada State Department of Conservation and Natural Resources
3. The Nevada State Fire Marshall

4. The Administrator of the Division of Industrial Relations of the Nevada State Department of Business and Industry

Hazardous Materials use special use permits require noticing property owners within 1,000ft of the project 30 days prior to a Planning Commission or Board of County Commissioner hearing per 110.810.42.(c). Thirty-five property owners within 21,000ft of the site were noticed for this application in order to meet normal SUP noticing requirements.

Truckee Canyon Area Plan

Staff reviewed the Truckee Canyon area plan and did not find any applicable policies.

High Desert Area Plan

HD2.2 Site development plans in the High Desert planning area must submit a plan for the control of noxious weeds. The plan should be developed through consultation with the Washoe County District Health Department, the University of Nevada Cooperative Extension, and/or the Washoe-Storey Conservation District. The control plan will be implemented on a voluntary compliance basis.

Staff Comment: The application was forwarded to the Washoe Storey Conservation District, who provided comments in Exhibit M.

HD2.3 Applicants required to present their items to the Citizen Advisory Board (CAB) must submit a statement to staff regarding how the final proposal responds to the community input received from the CAB.

Staff Comment: The applicant provided a statement responding to community input received from the CAB. This can be found in Exhibit B.

HD2.5 Any lighting proposed must show how it is consistent with current best practice “dark-sky” standards. In subdivisions established after the date of final adoption of this plan the use of street lights will be minimized.

Staff Comment: The application states that all lighting will be dark-sky compliance. Staff provided detailed analysis of the implementation of the lighting code in the Article 414 section, above.

HD2.6 Street lights, security lights, and other outdoor lighting should be powered by solar or other renewable energy sources whenever possible. Proposals to utilize traditional energy sources must explain why alternative sources are not possible.

Staff Comment: The proposed application is a renewable power facility. Any lighting provided on site will be provided by this renewable energy source.

HD 2.11 Development activities should be designed to support the efficient use of infrastructure and the conservation of recharge areas, habitat, and open vistas.

Staff Comment: The application was forwarded to Washoe County Engineering division, Nevada Water Resources, and Nevada Department of Environmental Protections. Washoe County Engineering and Nevada Water Resources both provided conditions in Exhibit A addressing these concerns.

HD 2.13 – The approval of all special use permits and administrative permits must include a finding that the community character as described in the Character Statement can be adequately conserved through mitigation of any identified potential negative impacts.

Staff Comment: Staff believes that the proposed development adequately conserves the community character described in the Character Statement with the waived landscaping requirements. The absence of formal landscaping and revegetation of disturbed areas maintains the existing high

desert environment and the un-slatted chain link fence reduces noise and preserves views in the San Emidio Valley.

HD 6.1 The Washoe County Departments of Community Development and Public Works will establish and oversee compliance with design standards for grading that minimize the visual impact of all residential and non-residential hillside development, including road cuts and driveways. See Policy HD.2.1 regarding grading under Goal Two.

Staff Comment: Staff provided detailed analysis of the implementation of the grading code in the Article 438 section, above.

HD 6.2 The grading design standards referred to in HD.6.1 are intended to, at a minimum, ensure that disturbed areas shall be finished, fill slopes will not exceed a 3:1 slope, and that hillside grading will establish an undulating naturalistic appearance by creating varying curvilinear contours.

Staff Comment: Staff provided detailed analysis of the implementation of the grading code in the Article 438 section, above.

HD 6.4 County will review its revegetation policy, require additional funds be set aside for revegetation, and mandate eighty percent (80%) reestablishment of vegetation prior to release of the bonds.

Staff Comment: Staff provided detailed analysis of both the landscaping and grading codes in the Article 412 and Article 438 sections above. This application was forwarded to Washoe County Engineering, who provided conditions of approval in Exhibit A. Their memo can be found as Exhibit C.

HD7.2 Washoe County will cooperate and participate with state, federal and Native American agencies in the planning and conservation activities of those agencies related to cultural and historic resources.

Staff Comment: The applicant is currently working with the federal government to complete an Environmental Assessment. This assessment can be found at: https://eplanning.blm.gov/public_projects/1503204/200352910/20019390/250025594/North%20Valley%20Geothermal%20Public%20Draft%20EA_508.pdf .

Washoe County forwarded this application to the Bureau of Land Management, Pyramid Lake Paiute Tribe, the Nevada Historical Preservation Office for comment. The Pyramid Lake Paiute Tribe provided comments in Exhibit L. Staff received no comments or conditions regarding this application from the other two agencies.

HD 10.2 Development in the High Desert planning area will comply with all local, state and federal standards regarding air quality.

Staff Comment: The application was forwarded to Washoe County Health District's Air Quality Management division who provided conditions in Exhibit A. Their memo can be found as Exhibit E.

HD 10.3 The granting of special use permits in the High Desert planning area must be accompanied by a finding that no significant degradation of air quality will occur as a result of the permit. As necessary, conditions may be placed on special use permits to ensure no significant degradation of air quality will occur. The Department of Community Development will seek the advice and input of the Air Quality Division of the Washoe County Health District in the implementation of this policy.

Staff Comment: The application estimates that approximately 12 tons of pentane will be lost every year through rotation seals and flanges on the heat exchangers and maintenance. The application was forwarded to Washoe County Health District's Air Quality Management division who provided conditions in Exhibit A. Their memo can be found as Exhibit E.

HD 11.1 Development proposals, with the exception of single family homes and uses accessory to single family homes within the High Desert planning area will include detailed soils and geo-technical studies sufficient to:

a. Ensure structural integrity of roads and buildings.
b. Provide adequate setbacks from potentially active faults or other hazards.
c. Minimize erosion potential.

Staff Comment: The applicant provided detailed geotechnical studies in section 4 of the application packet.

HD 11.2 Development proposals in areas with identified geological hazards will follow the recommendations of any geo-technical study conducted pursuant to Policy HD.11.1

Staff Comment: The applicant provided a geotechnical study within section 4 of the application. The application was forwarded to Washoe County Engineering, who provided conditions of approval in Exhibit A. Their memo can be found as Exhibit C.

HD 12.1 Prior to the approval of master plan amendments, tentative maps, public initiated capital improvements, or any project impacting 10 or more acres in the High Desert planning area, the Nevada Department of Wildlife will be contacted and given an opportunity to provide conservation, preservation, or other wildlife and habitat management input to the project.

Staff Comment: The application was forwarded to the Nevada Department of Wildlife to review. Staff received no comments or conditions regarding this application.

HD 12.2 Any development that has the potential to negatively impact an established wildlife migration route or critical habitat, including but not limited to traditional mule deer migration routes, deer winter range, federally classified Threatened and Endangered Species and their associated habitat must demonstrate how that project will protect the integrity of the migration route or habitat.

Staff Comment: This application does not impact mule deer habitat, sage grouse breeding areas, crucial antelope winter range, nor known raptor nests as outlined in the Conservation Element of the Master Plan.

HD 14.1 Washoe County will promote geothermal development, except where mitigation measures will not protect the existing air and water quality standards.

Staff Comment: Washoe County has reviewed the application for geothermal development. The application was forwarded to the Washoe County Health District Air Quality Management, who provided conditions in Exhibit A. The application was forwarded to the Washoe County Water Rights Coordinator, who provided comments and conditions in Exhibit H. Their memo can be found as Exhibit H.

HD14.2 Washoe County will apply adequate standards to govern all phases of geothermal exploration and development, including the restoration of all such areas once the resource becomes nonproductive.

a. The Washoe County Department of Community Development, in conjunction with existing or newly created public and private agencies and individuals will identify and document standards for use of geothermal resources, disposal of any resulting waste, and reclamation of geothermal sites. Until such standards are available, the Washoe County Department of Community Development will review all proposals for geothermal resource development to encourage full use of the potential and to ensure that adverse environmental impacts are avoided.

b. The Washoe County Department of Community Development will require the developer of geothermal resources to comply with local, state, and federal laws and regulations governing the

disposal of geothermal fluids. Before approval is given for resource development, a disposal plan must be submitted to and approved by the Washoe County Board of County Commissioners.

Staff Comment: Washoe County has provided standards to govern all phases of geothermal exploration and development in Article 328 of the development. Staff reviewed the proposed facility in the Article 328 section, above.

HD 16.4 Developments served by on-site sewage disposal systems must comply with current regulations, protect surface and groundwater from contamination, and prevent the spread of disease with regard to sewage disposal and water quality and supply.

Staff Comment: The application was forwarded to the Washoe County Health District, who provided comments and conditions in Exhibit A. Their memo can be found as Exhibit D.

HD 17.2 The use of new production wells for future development must not create water quality degradation at existing production and domestic wells.

Staff Comment: The applicant outlines that the proposed project construction will use 50,000 gallons per day for first 2 months for dust control and 5,000 gallons per day for next 6 months. The proposed facility will used 325 gallons per day (0.37 acre feet per year). during normal operations.

The application was forwarded to the Washoe County Water Rights Coordinator who provided comments and conditions in Exhibit H.

HD20.4 Developments served by on-site sewage disposal systems must comply with current regulations, protect surface and groundwater from contamination, and prevent the spread of disease with regard to sewage disposal and water quality and supply.

Staff Comment: The application was forwarded to the Washoe County Health District, who provided comments and conditions in Exhibit D.

High Desert and East Truckee Canyon Citizen Advisory Boards.

Neither the High Desert nor the East Truckee Canyon Citizen Advisory Boards had a scheduled CAB meeting within the required processing time prior to the Planning Commission. CAB worksheets were sent out to both CAB. Staff received two CAB worksheets back from CAB members, attached in Exhibit B. These worksheets reflect concerns on the following items:

- Distance to the fire station
- Issues regarding the borrow pit
- Wear and tear on Rodeo Creak Road
- Fire prevention for reduce brush
- Water table concerns
- Water use and construction crews
- Pentane emissions

The CAB worksheet specifically mentioned that Ormat has been a good neighbor overall.

Reviewing Agencies

The following agencies received a copy of the project application for review and evaluation.

- Bureau of Land Management
  - Nevada State Office

- Winnemucca District Office
- US Fish and Wildlife
- Nevada Department of Environmental Protection
- Nevada Department of Forestry – Endangered Species
- Nevada Department of Transportation
- Nevada Division of Water Resources
- Nevada Department of Wildlife
- Nevada Division of Minerals
- Washoe County Community Services Department
  - Planning and Building Division
  - Engineering and Capital Projects Division
  - Water Resource Planning
  - Water Rights Manager
  - Parks and Open Spaces
- Washoe County Sheriff's Office
- Washoe County Health District
  - Air Quality Management Division
  - Environmental Health Services Division
  - Emergency Medical Services
- Truckee Meadows Fire Protection District
- Washoe Storey Conservation District
- Pyramid Lake Paiute Tribe
- Nevada Historic Preservation
- Washoe County Director of Emergency Management
- Nevada State Fire Marshall
- Division of Industrial Relations of the Nevada Department of Business and Industry
- Truckee Meadows Regional Planning Agency.
- Regional Transportation Commission

Twelve out of the twenty-seven above listed agencies/departments provided comments and/or recommended conditions of approval in response to their evaluation of the project application. Three of the agencies reviewed the application and had no comments. A **summary** of each agency's comments and/or recommended conditions of approval and their contact information is provided. The Conditions of Approval document is attached to this staff report and will be included with the Action Order

- Washoe County Planning and Building Division addressed the hours of operation, set landscaping, parking and grading standards and imposed operational conditions that will be in effect for the life of the project.

  Contact: Dan Cahalane, Planner, dcahalane@washoecounty.us, 775-328-3628

- Washoe County Engineering Division addressed grading and drainage will be in effect for the life of the project.

  Contact: Leo Vesely, lvesely@washoecounty.us, 775-328-2313

- Washoe County Health District addressed water and septic system requirements.

  Contact: James English, jenglish@washoecounty.us

- Washoe County Air Quality Management addressed emissions and dust control requirements.

  Contact: Genine Rosa, grosa@washoecounty.us, 775-784-7204

- Washoe County Parks Program addressed revegetation and noxious weed requirements.

  Contact: Sophia Kirschenman, skirschenman@washoecounty.us

- Truckee Meadow Fire Protection District addressed fire access, the wildland urban interface, fire water supply, and hazardous materials requirements.

  Contact: Dale Way/Brittany Lemon, dway@tmfpd.us / blemon@tmfpd.us, 775-326-6000

- Washoe County Water Rights Coordinator addressed water rights issues.

  Contact: Vahid Behmaram, vbehmaram@washoecounty.us

- Nevada Water Resources addressed water rights issues.

  Contact: Steve Shell, sshell@water.nv.gov

- Nevada Department of Transportation addressed transmission lines crossing their right of way, trip generation, and mitigation measures.

  Contact: Tara Smaltz, 775-834-8365 (Alex Wolfson)

- Washoe County Emergency Management requested the applicant coordinate with the Gerlach Fire Department to review emergency response procedures.

  Contact: Aaron Kenneston, akenneston@washoecounty.us

- Pyramid Lake Paiute Tribe provided comments on effects on ground water, geothermal resources, and impacts on endangered species in Pyramid Lake.

  Contact: Donna Marie Noel, DNoel@plpt.nsn.us

- Washoe Storey Conservation District provided comments on reseeding, building color, and lighting.

  Contact: Brett Tyler, 775-857-8500 ex 131

- Truckee Meadows Regional Planning Agency provided comments on compliance with the 2019 regional plan.

  Contact: Chris Tolley, CTolley@tmrpa.org

Staff Comment on Required Findings

WCC Section 110.810.30, Article 810, *Special Use Permits*, requires that all of the following findings be made to the satisfaction of the Washoe County Planning Commission before granting approval of the request. Staff has completed an analysis of the special use permit application and has determined that the proposal is in compliance with the required findings as follows.

1. Consistency. That the proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the East Truckee Canyon and High Desert Area Plans.

Staff Comment: The proposed project and use is consistent with the action programs, policies, standards, and maps of the Master Plan and Area Plan with the conditioned standards described in Exhibit A, Conditions of Approval.

2. Improvements. That adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven.

   Staff Comment: The applicant will provide commercial potable water in lieu of a well in order to reduce impacts to the relatively shallow water table and warm ground water. Therefore, there are adequate utilities, roadway improvements, sanitation, water supply, drainage and other necessary facilities.

3. Site Suitability. That the site is physically suitable for energy production, renewable; utility services, and hazardous material uses and for the intensity of such a development.

   Staff Comment: The site is physically suitable for the proposed use and intensity of the development. These parcels are located in an isolated area, generally surrounded by Federal lands. The negative impacts are adequately separated from incompatible residential uses.

4. Issuance Not Detrimental. That issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area.

   Staff Comment: The proposed conditions of approval and remaining state and federal permitting requirements mitigate the negative effects associated with operating the proposed facilities to the point of not being significantly detrimental to the public health, safety, or welfare.

5. Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

   Staff Comment: This facility will not affect a military installation.

Additional Findings:

110.810.35 Development of Natural Resources:

6. That the proposed development is not unduly detrimental to surrounding properties, land uses and the environment in general.

   Staff Comment: The applicant will provide revegetation to mitigate the impacts of dust and erosion from the construction of this facility. There will be no unduly detrimental effects to the surrounding environment.

7. That the proposed development will not unduly block scenic views or degrade and surrounding scenic facilities.

   Staff Comment: The applicant is providing un-slatted chain link fence and all structures will be in compliance with the 35 ft General Rural building height, mitigating impacts to scenic views and facilities.

8. That the proposed development will reclaim the site and all affected areas at the conclusion of the operation.

   Staff Comment: The applicant is required by code to reclaim the site and all affected areas per WCC 110.328.20(d).

Recommendation

After a thorough analysis and review, Special Use Permit Case Number WSUP20-0013 is being recommended for approval with conditions. Staff offers the following motion for the Commission's consideration.

Motion

I move that, after giving reasoned consideration to the information contained in the staff report and information received during the public hearing, the Washoe County Planning Commission approve with conditions Special Use Permit Case Number WSUP20-0013 for Orni 36, LLC for the following requests 1) establishment of an Energy Production, Renewable use type, 2) the establishment of a Hazardous Materials use, 3) major grading, and 4) request to vary parking, landscaping, and grading standards as recommended in the conditions of approval in Exhibit A , having made all five findings in accordance with Washoe County Code Section 110.810.30 and the additional findings in accordance with Washoe County Code Section 110.810.35, 40, & 42:

1. Consistency. That the proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the East Truckee Canyon and High Desert Area Plans;
2. Improvements. That adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;
3. Site Suitability. That the site is physically suitable for energy production, renewable; utility services, and hazardous material uses and for the intensity of such a development;
4. Issuance Not Detrimental. That issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area;
5. Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

110.810.35 Development of Natural Resources:

6. That to proposed development is not unduly detrimental to surrounding properties, land uses and the environment in general.
7. That to proposed development will not unduly block scenic views or degrade and surrounding scenic facilities.
8. That to proposed development will reclaim the site and all affected areas at the conclusion of the operation.

Appeal Process

Planning Commission action will be effective 10 calendar days after the written decision is filed with the Secretary to the Planning Commission and mailed to the applicant, unless the action is appealed to the Washoe County Board of County Commissioners, in which case the outcome of the appeal shall be determined by the Washoe County Board of County Commissioners. Any appeal must be filed in writing with the Planning and Building Division within 10 calendar days from the date the written decision is filed with the Secretary to the Planning Commission and mailed to the applicant.

Applicant:	Orni 36, LLC, 6140 Plumas St, Reno, NV, 89519
Representative	Wood Rogers, Inc. 1361 Corporate Blvd. Reno, 89502

Conditions of Approval

Special Use Permit Case Number WSUP20-0013

The project approved under Special Use Permit Case Number WSUP20-0013 shall be carried out in accordance with the conditions of approval granted by the Planning Commission on September 1, 2020. Conditions of approval are requirements placed on a permit or development by each reviewing agency. These conditions of approval may require submittal of documents, applications, fees, inspections, amendments to plans, and more. These conditions do not relieve the applicant of the obligation to obtain any other approvals and licenses from relevant authorities required under any other act.

Unless otherwise specified, all conditions related to the approval of this special use permit shall be met or financial assurance must be provided to satisfy the conditions of approval prior to issuance of a grading or building permit. The agency responsible for determining compliance with a specific condition shall determine whether the condition must be fully completed or whether the applicant shall be offered the option of providing financial assurance. All agreements, easements, or other documentation required by these conditions shall have a copy filed with the County Engineer and the Planning and Building Division.

Compliance with the conditions of approval related to this special use permit is the responsibility of the applicant, his/her successor in interest, and all owners, assignees, and occupants of the property and their successors in interest. Failure to comply with any of the conditions imposed in the approval of the special use permit may result in the institution of revocation procedures.

Washoe County reserves the right to review and revise the conditions of approval related to this Special Use Permit should it be determined that a subsequent license or permit issued by Washoe County violates the intent of this approval.

For the purpose of conditions imposed by Washoe County, "may" is permissive and "shall" or "must" is mandatory.

Conditions of approval are usually complied with at different stages of the proposed project. Those stages are typically:

- Prior to permit issuance (i.e., grading permits, building permits, etc.).
- Prior to obtaining a final inspection and/or a certificate of occupancy.
- Prior to the issuance of a business license or other permits/licenses.
- Some " conditions of approval" are referred to as "operational conditions." These conditions must be continually complied with for the life of the project or business.

The Washoe County Commission oversees many of the reviewing agencies/departments with the exception of the following agencies.

- **The DISTRICT BOARD OF HEALTH, through the Washoe County Health District, has jurisdiction over all public health matters in the Health District. Any conditions set by the Health District must be appealed to the District Board of Health.**

FOLLOWING ARE CONDITIONS OF APPROVAL REQUIRED BY THE REVIEWING AGENCIES. EACH CONDITION MUST BE MET TO THE SATISFACTION OF THE ISSUING AGENCY.

Washoe County Planning and Building Division

1. The following conditions are requirements of Planning and Building, which shall be responsible for determining compliance with these conditions.

   Contact Name – Dan Cahalane, Planner, dcahalane@washoecounty.us, 775.328.3628

   a. The applicant shall attach a copy of the action order approving this project to all permits and applications (including building permits) applied for as part of this special use permit.

   b. The applicant shall demonstrate substantial conformance to the plans approved as part of this special use permit. The Planning and Building Division shall determine compliance with this condition.

   c. The applicant shall submit construction plans, with all information necessary for comprehensive review by Washoe County, and initial building permits shall be issued within two years from the date of approval by Washoe County. The applicant shall complete construction within the time specified by the building permits. Compliance with this condition shall be determined by the Planning and Building Division.

   d. A note shall be placed on all construction drawings and grading plans stating:

      NOTE

      Should any cairn or grave of a Native American be discovered during site development, work shall temporarily be halted at the specific site and the Sheriff's Office as well as the State Historic Preservation Office of the Department of Conservation and Natural Resources shall be immediately notified per NRS 383.170.

   e. The applicant shall provide Washoe County staff a list of the drilling chemicals along with a chemical fact sheet prior to issuance of any building permits.

   f. Parking standards shall be varied to allow all non-ADA required parking spaces to be unpaved.

   g. Landscaping standards shall be varied so as to not require the standards listed in WCC 110.412.45(a-d).

   h. Prior to the issuance of building/grading permits, the applicant shall post a financial assurance for reclamation for eighty percent (80%) of the total reclamation costs for each well pad to ensure compliance with WCC 110.328.25(d). At a minimum, revegetation of the well pads must result in eighty percent (80%) re-establishment of vegetation prior to the release of the bonds.

   i. Finish grading may vary from the natural slope by more than ten (10) feet in elevation on this project provided that these areas abide by the following mitigating standards:

      i. The proposed cut and/or fill slopes shall include stepped-back terraces (either retaining walls or stabilized slopes), and;

      ii. The proposed terraces are revegetated, are a minimum of six (6) feet in width, and have a slope flatter than three horizontal to one vertical (3:1);

      iii. Retaining walls used to create terraces are limited to a maximum vertical height of ten (10) vertical feet;

      iv. Terrace widths shall be at least 60% percent of the height of the higher of the two adjacent retaining walls;

v. Bench widths shall be at least four (4) feet.

j. The following **Operational Conditions** shall be required for the life of the development:

i. Per WCC 110.810.70 (b)(2), failure to comply with one or more of the conditions of approval shall result in the initiation of revocation proceedings as set forth in WCC 110.810.70. Compliance with this condition shall be determined by Planning and Building.

Washoe County Engineering and Capital Projects

2. The following conditions are requirements of the Engineering Division, which shall be responsible for determining compliance with these conditions.

Contact Name – Leo Vesely, lvesely@washoecounty.us, 775.328.2313

a. A complete set of construction improvement drawings, including an on-site grading plan, shall be submitted when applying for a building/grading permit. Grading shall comply with best management practices (BMPs) and shall include detailed plans for grading, site drainage, erosion control (including BMP locations and installation details), slope stabilization, and mosquito abatement. Placement or removal of any excavated materials shall be indicated on the grading plan. Silts shall be controlled on-site and not allowed onto adjacent property.

b. The developer shall obtain from the Nevada Division of Environmental Protection a Stormwater Discharge Permit and submit a copy to the Engineering Division prior to issuance of a grading permit.

c. The Truckee Meadows Regional Stormwater Quality Management Program Construction Permit Submittal Checklists and Inspection Fee shall be submitted with the grading permit.

d. A grading bond of $2,000/acre of disturbed area shall be provided to the Engineering Division prior to any grading.

e. All grading shall be in accordance with Article 110.438 Grading Standards.

f. Estimated total earthwork volumes and area of disturbance shall be indicated on the grading plans.

g. All disturbed areas left undeveloped for more than 30 days shall be treated with a dust palliative. Disturbed areas left undeveloped for more than 45 days shall be revegetated. Specifications for revegetation procedure and seed mix shall be prepared by a licensed landscape architect.

h. Prior to the issuance of the grading permit, applicant shall demonstrate they have legal access to their parcels including access across any private property and/or BLM lands.

i. Access roads serving the project shall be all-weather and shall be surfaced with a minimum of six (6) inches of Type 2 Class B aggregate road base or approved equal and shall be provided with adequate roadside drainage and cross drainage consistent with County standards.

j. The applicant shall provide permanent easements for lease areas, access and utilities. A copy of the easements shall be submitted to the Engineering Division prior to issuance of a building permit.

k. All existing and proposed easements shall be shown on the site and/or grading plan. The County Engineer shall determine compliance with this condition.

l. A hydrology/hydraulic report prepared by a registered engineer shall be submitted to the Engineering Division for review and approval. The report shall include the locations, points

of entry and discharge, flow rates and flood limits of all 5- and 100-year storm flows impacting both the site and offsite areas and the methods for handling those flows. The report shall include all storm drain-pipe and ditch sizing calculations and a discussion of and mitigation measures for any impacts on existing offsite drainage facilities and properties.

m. Any increase in storm water runoff resulting from development shall be detained on site to the satisfaction of the County Engineer.

Washoe County Health District

3. The following conditions are requirements of Washoe County Health District, which shall be responsible for determining compliance with these conditions.

   Contact Name – James English, jenglish@washoecounty.us

   a. The WCHD does not have any requirements or conditions for this application as submitted, please see Condition #c for potable water note.

   b. If the application is approved, the applicant will have to go through all WCHD plan review and permitting requirements. Nevada Division of Environmental Protection (NDEP) will approve the design of the proposed onsite sewage disposal system, this approval must be incorporated into the WCHD plan review.

   c. The application states there will not be a potable water well onsite, and water for employee drinking purposes will be provided from a commercial source. It is recommended any emergency showers or other personnel emergency wash equipment utilize potable water.

Washoe County Air Quality Management

4. The following conditions are requirements of the Engineering Division, which shall be responsible for determining compliance with these conditions.

   Contact Name – Genine Rosa, grosa@washoecounty.us, 775.784.7204

   a. The applicant must apply for and obtain a Dust Control Permit prior to commencement of the dust generating activity. In the Dust Control Permit application, the owner and/or operator shall designate a person responsible for compliance with the "District Board of Health Regulations Governing Air Quality Management." Failure to comply with the provisions of an approved Dust Control Permit shall be deemed a violation of this Rule. The Dust Control Permit will be valid for a period of 18 months and dust control plans must be valid during the "construction" of the project. Link to Dust Control Permit Application: https://www.washoecounty.us/health/programs-and-services/air-quality/Dust.php

   b. Before the expiration of the dust control permits for the project a written dust control plan must be submitted to Washoe County Air Quality management describing how dust from the project will be control to comply with District regulations in perpetuity.

   c. An application for Authority to Construct/Modify and/or Permit to Operate will be required, link to Stationary Source page: https://www.washoecounty.us/health/programs-and-services/air-quality/Stationary%20Sources.php

Washoe County Parks Program

5. The following conditions are requirements of the Parks Program Division, which shall be responsible for determining compliance with these conditions in conjunction with Washoe County Planning.

   Contact Name – Sophia Kirschenman, skirschenman@washoecounty.us

a. All earthen material imported as part of this project is required to be "certified weed free" in order to prevent the spread of noxious weeds within the county.

b. Prior to the issuance of building/grading permits, the applicant shall submit a revegetation plan, prepared by a biologist or other qualified professional, to Washoe County Parks for review and approval. At a minimum, the plan will include: existing site conditions; the area of impact; restoration goals; selection of native/perennial adapted plants or seed mixes; revegetation methods; measures to prevent the spread of noxious weeds; revegetation success criteria; and appropriate monitoring provisions.

c. Prior to the issuance of building/grading permits, the applicant shall post a revegetation bond for eighty percent (80%) of the total revegetation costs. At a minimum, revegetation must result in eighty percent (80%) re-establishment of vegetation prior to the release of the bonds.

Truckee Meadows Fire Protection District

6. The following conditions are requirements of the Truckee Meadows Fire Protection District, which shall be responsible for determining compliance with these conditions.

   Contact Name – Dale Way / Brittany Lemon, dway@tmfpd.us / blemon@tmfpd.us, 775.326.6000

   Fire Apparatus Access Roads

   a. Fire apparatus access roads shall be in accordance with *International Fire Code* Appendix D and all other applicable requirements of the IFC. (IFC 503.1 / D101.1)

   b. Approved fire apparatus access roads shall be required for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access roads shall comply with the requirements of IFC Section 503 and Appendix D and shall extend to within 150 feet of all portions of the facility and all portions of the *exterior walls* of the first story of the building as measured by an *approved* route (as the hose lays around obstructions) around the exterior of the building or facility (IFC 503.1.1)

   c. Fire apparatus access roads shall have an all-weather surface and be capable of supporting the weight of Fire District apparatus (80,000 pounds). (IFC 503.2.3 / D102.1)

   d. Fire apparatus access roads shall have a minimum width of 20 feet (with no parking), 26 feet (one side parking), and 32 feet (parking on both sides), exclusive of shoulders, and an unobstructed vertical clearance of not less than 13 feet 6 inches. (IFC 503.2.1 / D103.6.1 / D103.6.2)

   e. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1). (IFC D103.1)

   f. Fire apparatus access roads less than the width required for parking on both sides shall be marked and/or signed in accordance with Section 503.3 and Appendix D103.6 to identify such roads or prohibit the obstruction thereof. The means by which fire lanes are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility. (IFC 503.3 / D103.6)

   g. Fire apparatus access roads shall not exceed 10 percent in grade. Angles of approach and angles of departure must not exceed 6 percent for 25 feet before or after the grade change. (IFC D103.2 / 503.2.8)

   h. Fire apparatus access roads shall have a minimum inside turning radius of 28 feet, and a minimum outside turning radius of 52 feet. (IFC D103.3)

i. Dead-end fire apparatus access roads in excess of 150 feet shall be provided with width and turnaround provisions in accordance with Table D103.4. (IFC D103.4)

j. Gates across fire apparatus access roads shall comply with Appendix D103.5 and Sections 503.4 and 503.5.

k. Buildings four or more stories or 30 feet in height shall have at least two (2) means of fire apparatus access for each structure. (IFC D104.1).

l. Buildings exceeding 62,000 square feet in area shall have at least two (2) means of fire apparatus access for each structure. (IFC D104.2).

m. Where two (2) fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses. (IFC D104.3)

n. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet *approved* aerial fire apparatus access roads shall be provided. (IFC D105.1)

o. When aerial fire apparatus access roads are required, aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building or portion thereof. (IFC D105.2)

p. When aerial fire apparatus access roads are required, one or more of the required access routes meeting this condition shall be located not less than 15 feet and not greater than 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the *fire code official*. (IFC D105.3)

q. When aerial fire apparatus access roads are required, overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the *fire code official*. (IFC D105.4)

Fire Protection Water Supplies

r. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises on which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. (IFC 507.1)

s. The number of fire hydrants available to a building shall be not less than the minimum specified in Table C102.1. (IFC C102.1)

t. Fire hydrant systems shall comply with Washoe County Standard Detail W-23 and IFC Sections 507.5.1 through 507.5.6. (IFC 507.5 / Washoe County Code)

u. Fire hydrants must be spaced at a maximum separation of 500 feet along the required apparatus access lane in residential areas and 1,000 feet where not required for structures to provide for transportation hazards. Hydrant spacing may be increased by 125 feet if all structures within the development are provided with fire sprinkler protection. There is no allowable increase for hydrants installed for transportation hazards. (IFC Table C102.1)

v. In developments with R-3 occupancies, where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 600 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official. (IFC 507.5.1)

w. Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants. (IFC 507.5.4)

x. A 3-foot minimum clear space shall be maintained around the circumference of fire hydrants, as measured from the furthest edge of a fire hydrant in any direction. (IFC 507.5.5)

y. Fire hydrants shall not be located within six feet of a driveway, power pole, or light standard. (IFC 507.5.6)

z. Fire hydrants shall be located adjacent to apparatus access lanes and a minimum of four feet and a maximum of seven feet from back of curb. Provide a detail on the plans. (IFC 507.5.6)

aa. Fire hydrants shall have a concrete pad around the base in accordance with Washoe County Standard Detail W-23.

International Wildland-Urban Interface Code

bb. All parcels located in other than a Low Hazard WUI Rating shall comply with all provisions of the IWUI as adopted and amended by TMFPD and Washoe County Building.

cc. The IWUI Fire Hazard designation for your project is available on the provided Washoe Regional Mapping System link. (https://gis.washoecounty.us/wrms/firehazard). After you have found your property using the address search feature, the color of the background area will indicate your wildland fire risk.

dd. When you have determined your Fire Risk Rating use the link provided, to determine the *IWUIC* construction and defensible space requirements. (https://www.washoecounty.us/building/Files/Files/2012%20WUI%20CODE%20GUIDE_rev%2011-25-13.pdf).

Hazardous Materials

ee. The proposed project states that it will use 720,000 gallons of pentane which equates to 376,264.24 pounds and therefore exceeds the threshold quantity for this chemical in NAC 459.9533. Hazardous materials storage, use, and handling shall comply with the 2018 IFC and all associated Referenced Standards.

Fire Protection Report

ff. Due to the complexity of this facility, a Fire Protection Report (FPR) prepared by a Nevada licensed Fire Protection Engineer shall be required, in accordance with IFC 104.12, to be submitted and approved to TMFPD prior to construction of any tanks or vessels for the storage of chemicals deemed hazardous materials by the 2018 IFC. The FPR shall include a description of the facility, construction types, occupancy and use groups, and how fire protection will be provided for the facility.

Nevada Division of Water Resources

7. The following conditions are requirements of the Nevada Division of Water Resources, which shall be responsible for determining compliance with these conditions.

Contact Name – Steve Shell, sshell@water.nv.gov

a. A permit to appropriate the geothermal water of the state of Nevada must be presented to the State Engineer for approval and signed through his office prior to development.

Nevada Department of Transportation

8. The following conditions are requirements of the Nevada Department of Transportation, which shall be responsible for determining compliance with these conditions.

   Contact Name – Tara Smaltz, 775.834.8365 (Alex Wolfson)

   a. The project proposes a transmission line crossing of State Route 447 (SR-447) at APNs 071-030-06 and 071-030-07. SR-447 is a NDOT owned and maintained roadway that is functionally classified as a major collector.

      i. NDOT will require an occupancy permit for the transmission line crossing within the NDOT right of way. Please contact the NDOT District II Permits Office at (775) 834-8330 for more information relating to obtaining occupancy permits.

      ii. All work constructed within the NDOT right of way will be required to comply with the NDOT Standard Plans and Terms and Conditions Relating to Right-of-Way Occupancy Permits, current at the time of application.

   b. The project proposes to use existing dirt approaches to SR-447 for project access during construction and after full build-out.

      i. The applicant will be required to submit a trip generation document or traffic study to NDOT showing how many vehicle trips are generated during the construction phase and after full build-out of the project.

      ii. Based on the vehicle trips generated by the project, permanent or temporary mitigation measures may be required to reduce project impacts to the State highway system.

*** End of Conditions ***

Washoe County Citizen Advisory Boards
CAB Member Worksheet

Citizen Advisory Board: Gerlach CAB
Meeting Date (if applicable)**:**
Topic or Project Name (include Case No. if applicable)**:**
WSUP20-0013

Washoe County Planner Dan Cahalane

Please check the appropriate box:

My comments ❑ were (or) x❑ were not discussed during the meeting.

Identified issues and concerns:

1. Sect 1 –pg8 – #10 -Fire station is over 22 miles away. **An on-site fire suppression system, along with fire protection training of personnel, will be included with the project implementation.**

2. Sect 1 – pg9 - #4, 5, 6 – Is the borrow pit expansion covered under and EIS? **The Borrow/Aggregate Pit expansion is covered in the Environmental Assessment (EA) being completed to fulfill the requirements of the National Environmental Policy Act (NEPA).**

3. Sect 2 – pg 2 – Site Char – Has any discussion been made on the wear and tear of Rodo Creek Road. With the added use during building and even long term wear afterwards. Does Ormat intend to help with maintenance? **Discussions with Washoe County Community Services Department (Roads) have not begun. However, Ormat would have a Road Maintenance Agreement in place prior to major construction activities. This is standard procedure for all of our development projects.**

4. Sect 2 – pg 3 – last para – Is there a reduce brush near these plan in place, is there a fire prevention/suppression system in place? **Vegetation clearing would only take place in areas where deemed necessary – of which all areas would be covered with gravel. For fire suppression, the power plants utilize a fire loop system with deck guns strategically placed through the footprint.**

5. Sect 2 – pg 4 – last para – Can the Sweetwater Well and water table handle this? Will it affect the drinking water on the ranch side? **Ormat is not proposing to consume additional water resources than what is under permit/certificate with Nevada DWR. The Project would require less than 0.4 afa for septic, which would be utilized under our existing water rights. Therefore, no additional drawdown of the freshwater aquifer on the west side of the valley would occur. Further, Ormat is working with BLM to develop a monitoring plan, where non-geothermal water resources would be monitored to identify any impacts from operations of a new power plant.**

6. Sect 2 – pg 5 – 2nd para and 3rd para - - My understanding is that this is a Pentane cooled system and only 2 employees will be on site after it becomes operational. So what are the 325 gallons of water a day being used for, how is it being disposed of? **The operational freshwater requirements (less than 0.4 afa) are intended for septic at the new power plant control room. This includes service to the sinks and toilets. Disposal would be through septic.** **With regards to the septic system can it handle the influx of construction crews, if they are staying onsite in trailers are they using a no-toxic, bio-degradable product for their RV tanks.** **The onsite trailers for construction crews are to be self-contained, and would be serviced regularly by a licensed contractor. Septic at the site would not be utilized for construction personnel.**

Sect 2 – pg 6 – HAZMAT – Is 12 tons of Pentane really minor. What happens to it? **Pentane does not degrade with use. During maintenance activities the pentane in the**

system is evacuated to storage tanks. However, small amounts trapped in flanges and at fitting may be released during maintenance activities, and Ormat is required to permit these small losses through NDEP BAPC.

Sect 2 – pg 7 – TRF CIR – Same question again – Rodeo Creek improve/maint? See above

Sect 2 – pg 7 – UTIL – This seems to contradict # 6 above about where the water is coming from? And again how are they handling the use of RVS? It should be noted that the only "freshwater" required for operation would be used for domestic purposes (e.g. sinks & toilets). For construction, the majority of personnel would stay in hotels/motels, and for the contractors that choose to stay in RVs, the equipment is required to be self-contained with waste being disposed of properly. Hookup to the existing septic will not be allowed for construction personnel.

Suggested alternatives and/or recommendations:

All in all ORMAT has been a good neighbor. I was pleased to note the consideration for our dark skies was included. Water and road maintenance were the only two subjects that kept coming up.

I would also like to ask them what is the other project that has been impacting our area near Gerlach. Trespass on private lands for EIS for a future project. The Gerlach Project is a separate project from North Valley/San Emidio, and is still in the feasibility/exploration phase. Ormat has been invited by the Gerlach Improvement District to speak about the Gerlach Geothermal Project at a community meeting, and we intend to accommodate this request at a later date closer to a determination of project viability.

There are several good clean RV options on the market and for all I know they might already be using them, just would like to check. See above comment on hotel/RV usage.

Thank you

Name Elisabeth Gambrell **Date: 07/30/20**
(Please Print)

Signature: EMAIL SIGNATURE COVID PRECAUTION

This worksheet may be used as a tool to help you take notes during the public testimony and discussion on this topic/project. Your comments during the meeting will become part of the public record through the minutes and the CAB action memorandum. Your comments, and comments from other CAB members, will and shall not collectively constitute a position of the CAB as a whole. ****Due to Nevada Open Meeting Law considerations, please do not communicate with your fellow CAB members on items outside of the agendized discussions held at your regular CAB meetings.****

If you would like this worksheet forwarded to your Commissioner, please include his/her name.

Commissioner's Name: Jeanne Herman

Use additional pages, if necessary.

Please mail, fax or email completed worksheets to: Washoe County CSD - Planning
Agency Review Response
1001 East 9th Street, Reno, NV 89512

Email: cab@washoecounty.us

Washoe County Development Code
(Chapter 110 of the Washoe County Code)
Definition of Applications

Type of Application	Definition	Chapter/Article
Parcel Maps; and Second or Subsequent Parcel Maps	A parcel map is required for all minor subdivisions of four or fewer lots or common-interest units. If the application is subdividing a lot or lots created within five years from the creation of the original lot, a public notice card shall be sent to advisory boards indicating the review criteria and date and time of meeting.	110.606
Tentative Subdivisions	A tentative subdivision application is required for all proposed subdivisions of five or more lots and all common-interest units consisting of five or more units.	110.608
Variances	Standards within the Development Code may be varied (e.g. such as building height, setback requirements, landscape modifiers, etc.). Different standards apply in different land use designations. Typical requests are for lots with unique physical conditions that create a hardship (i.e. shape, topography, wetlands, public easements, etc.).	110.804
Use Permits	Civic, residential, commercial and industrial uses on a property may require a use permit. The type of use permit, if required, is noted on the *Table of Uses* in the *Development Code (110.302.05).* **Administrative Permits** are approved by the Hearing Examiner and usually involve relatively small impacts from a use. A **Special Use Permit** may be required for a proposed project when the intensity or size of the project, traffic generation, noise, impact on public facilities or compatibility with surrounding uses or other impacts must be evaluated.	110.808 and 110.810
Development Agreements	Allows for any person having a legal or equitable interest in land to enter into an agreement with Washoe County concerning the development of that land.	110.814
Development Code Amendment	Provides a method for amending the Development Code.	110.818
Master Plan Amendment	Provides a method for amending the Master Plan (e.g. changes of land use).	110.820
Regulatory Zone Amendment	Provides a method for amending regulatory zone boundaries (i.e. zone changes).	110.821

WASHOE COUNTY
COMMUNITY SERVICES DEPARTMENT
Engineering and Capital Projects

1001 EAST 9TH STREET
RENO, NEVADA 89512
PHONE (775) 328-3600
FAX (775) 328.3699

Date: July 30, 2020

To: Dan Cahalane, Planner

From: Leo Vesely, P.E., Licensed Engineer

Re: Special Use Permit Case **WSUP20-0013 – Ormat Geothermal**
APNs see application

GENERAL PROJECT DISCUSSION

Washoe County Engineering staff has reviewed the above referenced application. The Special Use Permit is to allow the establishment of an energy production, renewable use type for two 24mW geothermal power plans; major grading for 189.9 acres of ground disturbance, 200,000cy of excavation; and request to vary landscaping standards. The Engineering and Capital Projects Division recommends approval with the following comments and conditions of approval which supplement applicable County Code and are based upon our review of the site and the application prepared by Wood Rodgers. The County Engineer shall determine compliance with the following conditions of approval.

For questions related to sections below, please see the contact name provided.

GENERAL CONDITIONS
Contact Information: Leo Vesely, P.E. (775) 328-2313

1. A complete set of construction improvement drawings, including an on-site grading plan, shall be submitted when applying for a building/grading permit. Grading shall comply with best management practices (BMPs) and shall include detailed plans for grading, site drainage, erosion control (including BMP locations and installation details), slope stabilization, and mosquito abatement. Placement or removal of any excavated materials shall be indicated on the grading plan. Silts shall be controlled on-site and not allowed onto adjacent property.

2. The developer shall obtain from the Nevada Division of Environmental Protection a Stormwater Discharge Permit and submit a copy to the Engineering Division prior to issuance of a grading permit.

3. The Truckee Meadows Regional Stormwater Quality Management Program Construction Permit Submittal Checklists and Inspection Fee shall be submitted with the grading permit.

4. A grading bond of $2,000/acre of disturbed area shall be provided to the Engineering Division prior to any grading.

5. All grading shall be in accordance with Article 110.438 Grading Standards.

6. Estimated total earthwork volumes and area of disturbance shall be indicated on the grading plans.

7. All disturbed areas left undeveloped for more than 30 days shall be treated with a dust palliative. Disturbed areas left undeveloped for more than 45 days shall be revegetated. Specifications for revegetation procedure and seed mix shall be prepared by a licensed landscape architect.

8. Prior to the issuance of the grading permit, applicant shall demonstrate they have legal access to their parcels including access across any private property and/or BLM lands.

9. Access roads serving the project shall be all-weather and shall be surfaced with a minimum of six (6) inches of Type 2 Class B aggregate road base or approved equal and shall be provided with adequate roadside drainage and cross drainage consistent with County standards.

10. The applicant shall provide permanent easements for lease areas, access and utilities. A copy of the easements shall be submitted to the Engineering Division prior to issuance of a building permit.

11. All existing and proposed easements shall be shown on the site and/or grading plan. The County Engineer shall determine compliance with this condition

DRAINAGE (COUNTY CODE 110.416, 110.420, and 110.421)
Contact Information: Leo Vesely, P.E. (775) 328-2313

1. A hydrology/hydraulic report prepared by a registered engineer shall be submitted to the Engineering Division for review and approval. The report shall include the locations, points of entry and discharge, flow rates and flood limits of all 5- and 100-year storm flows impacting both the site and offsite areas and the methods for handling those flows. The report shall include all storm drain pipe and ditch sizing calculations and a discussion of and mitigation measures for any impacts on existing offsite drainage facilities and properties.

2. Any increase in storm water runoff resulting from development shall be detained on site to the satisfaction of the County Engineer.

TRAFFIC AND ROADWAY (COUNTY CODE 110.436)
Contact Information: Mitchell Fink (775) 328-2050

1. There are no traffic related conditions of approval.

UTILITIES (County Code 422 & Sewer Ordinance)
Contact Information: Tim Simpson, P.E. (775) 954-4648

1. There are no utility related conditions of approval.

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

June 20, 2020

Washoe County Community Services
Planning and Development Division
PO Box 11130
Reno, NV 89520-0027

RE: Ormat Geothermal; Various APNs
Special Use Permit; WSUP20-0013

Dear Washoe County Staff:

The following conditions are requirements of the Washoe County Health District, Environmental Health Services Division, (WCHD), which shall be responsible for determining compliance with these conditions.

Contact Name – James English - jenglish@washoecounty.us

a) Condition #1: The WCHD does not have any requirements or conditions for this application as submitted, please see Condition #3 for potable water note.

b) Condition #2: If the application is approved, the applicant will have to go through all WCHD plan review and permitting requirements. Nevada Division of Environmental Protection (NDEP) will approve the design of the proposed onsite sewage disposal system, this approval must be incorporated into the WCHD plan review.

c) Condition #3: The application states there will not be a potable water well onsite, and water for employee drinking purposes will be provided from a commercial source. It is recommended any emergency showers or other personnel emergency wash equipment utilize potable water.

If you have any questions or would like clarification regarding the foregoing, please contact Choose an item. regarding all Health District comments.

Sincerely,

James English, REHS, CP-FS
EHS Supervisor
Environmental Health Services Divsion
Washoe County Health District

Cahalane, Daniel

From: Rosa, Genine
Sent: Thursday, July 23, 2020 4:40 PM
To: Cahalane, Daniel
Subject: RE: WSUP20-0013 Ormat Geothermal

Thank you Dan.

1. The applicant must apply for and obtain a Dust Control Permit prior to commencement of the dust generating activity. In the Dust Control Permit application, the owner and/or operator shall designate a person responsible for compliance with the "District Board of Health Regulations Governing Air Quality Management." Failure to comply with the provisions of an approved Dust Control Permit shall be deemed a violation of this Rule. The Dust Control Permit will be valid for a period of 18 months and dust control plans must be valid during the "construction" of the project. Link to Dust Control Permit Application: https://www.washoecounty.us/health/programs-and-services/air-quality/Dust.php

2. Before the expiration of the dust control permits for the project a written dust control plan must be submitted to Washoe County Air Quality management describing how dust from the project will be control to comply with District regulations in perpetuity.

3. An application for Authority to Construct/Modify and/or Permit to Operate will be required, link to Stationary Source page: https://www.washoecounty.us/health/programs-and-services/air-quality/Stationary%20Sources.php

Feel free to contact me with any questions or concerns.

-Genine

Genine Rosa
Environmental Engineer II
O: (775) 784-7204

WASHOE COUNTY HEALTH DISTRICT
ENHANCING QUALITY OF LIFE
Public Health

Please consider the environment before printing this e-mail.

From: Cahalane, Daniel <DCahalane@washoecounty.us>
Sent: Thursday, July 23, 2020 4:13 PM
To: Rosa, Genine <Grosa@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

Hi Rosa,

This is a development application. Typically, the agencies either send and email or memo outlining that they have no conditions/comments or that they had conditions/comments.

WSUP20-0013
EXHIBIT E

Planning staff incorporates these comments/conditions into our staff report and conditions the approval of an application by including your conditions.

Most of the time, we don't necessarily get comments from AQM on the application. I've attached the last set of comments I received from AQM below, which was just an email of conditions.

On this case in particular, I wanted to call your attention to two aspects:

1. There is going to be approximately 194.9 acres of grading that will take place over 9months to 3 years
2. There is an estimated 12 tons of pentane gas that will be lost through rotating seals and flanges. (page 6 of the project description also within the draft EA)

Thank you for taking the time to review this application.
Regards,

Dan Cahalane
Planner|Community Services Department- Planning & Building Division
dcahalane@washoecounty.us| Office: 775.328.3628 | Fax: 775.328.6133
Visit us first online: www.washoecounty.us/csd
For Planning call (775) 328-6100 | Email: Planning@washoecounty.us

1001 E. Ninth St., Bldg A., Reno, NV 89512

Connect with us: cMail | Twitter | Facebook | www.washoecounty.us

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From: Rosa, Genine <Grosa@washoecounty.us>
Sent: Thursday, July 23, 2020 4:03 PM
Cc: Cahalane, Daniel <DCahalane@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

Hello Dan,

Can you help me out…what typically happens for these types of permits? Do you simply need an e-mail back from us with some conditions for them? I don't see anything in workflow? I'm sorry, it seems Mike was the only one familiar with this process. I do the plan review for building permits and am the permit writer and familiar with most requirements in these cases.

Please let me know how this is typically handled and I will work on it and for future reference please send to me.

Thank you,

Genine Rosa
Environmental Engineer II
O: (775) 784-7204

WASHOE COUNTY HEALTH DISTRICT
ENHANCING QUALITY OF LIFE
Public Health

Please consider the environment before printing this e-mail.

WSUP20-0013
EXHIBIT E

From: Hunter, Julie D. <JDHunter@washoecounty.us>
Sent: Thursday, July 23, 2020 3:33 PM
To: Rosa, Genine <Grosa@washoecounty.us>
Cc: Cahalane, Daniel <DCahalane@washoecounty.us>
Subject: FW: WSUP20-0013 Ormat Geothermal

Genine,

Here is application from CSD. Dan wanted to make sure you were aware of some information in the application attached. See Dan's email below.

Thank you,
Julie

Julie Hunter, M.S.
Senior Air Quality Specialist | Air Quality Management Division | Washoe County Health District
jdhunter@washoecounty.us | (775) 784-7210 | 1001 E. Ninth St., Bldg. B, Reno, NV 89512

OurCleanAir.com

From: Cahalane, Daniel <DCahalane@washoecounty.us>
Sent: Thursday, July 23, 2020 3:16 PM
To: Hunter, Julie D. <JDHunter@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

Hi Julie,

This should have been sent over as part of the normal review checklist process.

From: Cahalane, Daniel
Sent: Thursday, July 23, 2020 2:25 PM
To: Hunter, Julie D. <JDHunter@washoecounty.us>
Subject: WSUP20-0013 Ormat Geothermal

Hi Julie,

I just wanted to reach out the AQM reviewer on this application. Buried in the application materials is the following statement:

"Minor pentane losses that do occur will be due to the escape of this working fluid through rotating seals and flanges on the heat exchangers and during maintenance on the binary power plant units. All of these losses, estimated to average about 12 tones per year, requires increased safety and monitoring protocol." - page 6 of the Project Description.

I thought it might be something that is easy to miss and I wanted to ensure that AQM provided conditions of approval to mitigate these issues, along with the 193 acres of grading.

Thanks,
Regards,

Dan Cahalane
Planner|Community Services Department- Planning & Building Division
dcahalane@washoecounty.us| Office: 775.328.3628 | Fax: 775.328.6133
Visit us first online: www.washoecounty.us/csd
For Planning call (775) 328-6100 | Email: Planning@washoecounty.us

1001 E. Ninth St., Bldg A., Reno, NV 89512

Connect with us: cMail | Twitter | Facebook | www.washoecounty.us

WASHOE COUNTY
COMMUNITY SERVICES DEPARTMENT
Regional Parks and Open Space

1001 EAST 9TH STREET
RENO, NEVADA 89520-0027
PHONE (775) 328-3600
FAX (775) 328.3699

TO: **Dan Cahalane, Planner**

FROM: **Sophia Kirschenman, Park Planner**

DATE: **July 28, 2020**

SUBJECT: **Special Use Permit Case Number WSUP20-0013 (Ormat Geothermal)**

I have reviewed WSUP20-0013 on behalf of Washoe County Regional Parks and Open Space (Parks) and prepared the following comments:

If approved, this special use permit would allow for the construction of two geothermal power plants ±14 miles south of Empire, Nevada. Project activities would include: installation of ±21.6 miles of power transmission line; ±149.9 acres of disturbance; ±300,000 cubic yards of excavation; and ±60.0 acres of re-vegetation/reclamation. In order to comply with Open Space and Natural Resource Management Plan (OSNRMP) Natural Hazards Policy 2.6, High Desert Area Plan Policy 6.4, and Washoe County Master Plan Conservation Element Policy C.5.3, Washoe County Parks requires the following conditions of approval:

1. All earthen material imported as part of this project is required to be "certified weed free" in order to prevent the spread of noxious weeds within the county.
2. Prior to the issuance of building/grading permits, the applicant shall submit a revegetation plan, prepared by a biologist or other qualified professional, to Washoe County Parks for review and approval. At a minimum, the plan will include: existing site conditions; the area of impact; restoration goals; selection of native/perennial adapted plants or seed mixes; revegetation methods; measures to prevent the spread of noxious weeds; revegetation success criteria; and appropriate monitoring provisions.
3. Prior to the issuance of building/grading permits, the applicant shall post a revegetation bond for eighty percent (80%) of the total revegetation costs. At a minimum, revegetation must result in eighty percent (80%) re-establishment of vegetation prior to the release of the bonds.

Dan Cahalane, Planner
Washoe County – Community Services Department
1001 E. Ninth St
Reno, NV 89512
775.328.3628

July 14, 2020

Re: WSUP20-0013 – Conditions of Approval

Truckee Meadows Fire Protection District (TMFPD)

The following conditions are requirements of the Truckee Meadows Fire Protection District, which shall be responsible for determining compliance with these conditions. Unless otherwise stated, these conditions shall be met prior to the issuance of any building or grading permit or on an ongoing basis (phased development) as determined by TMFPD.

This development is subject to currently adopted Fire (2018 IFC) and Wildland-Urban Interface (2018 IWUI) Codes as well as adopted NFPA Standards, NRS 477, and NAC 459 at the time of development on the specific parcel.

Contact Name – Dale Way / Brittany Lemon, 775.326.6000, dway@tmfpd.us / blemon@tmfpd.us

Fire Apparatus Access Roads

1. Fire apparatus access roads shall be in accordance with *International Fire Code* Appendix D and all other applicable requirements of the IFC. (IFC 503.1 / D101.1)
2. Approved fire apparatus access roads shall be required for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access roads shall comply with the requirements of IFC Section 503 and Appendix D and shall extend to within 150 feet of all portions of the facility and all portions of the *exterior walls* of the first story of the building as measured by an *approved* route (as the hose lays around obstructions) around the exterior of the building or facility. (IFC 503.1.1)
3. Fire apparatus access roads shall have an all-weather surface and be capable of supporting the weight of Fire District apparatus (80,000 pounds). (IFC 503.2.3 / D102.1)
4. Fire apparatus access roads shall have a minimum width of 20 feet (with no parking), 26 feet (one side parking), and 32 feet (parking on both sides), exclusive of shoulders, and an unobstructed vertical clearance of not less than 13 feet 6 inches. (IFC 503.2.1 / D103.6.1 / D103.6.2)

5. Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet (7925 mm), exclusive of shoulders (see Figure D103.1). (IFC D103.1)
6. Fire apparatus access roads less than the width required for parking on both sides shall be marked and/or signed in accordance with Section 503.3 and Appendix D103.6 to identify such roads or prohibit the obstruction thereof. The means by which fire lanes are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility. (IFC 503.3 / D103.6)
7. Fire apparatus access roads shall not exceed 10 percent in grade. Angles of approach and angles of departure must not exceed 6 percent for 25 feet before or after the grade change. (IFC D103.2 / 503.2.8)
8. Fire apparatus access roads shall have a minimum inside turning radius of 28 feet, and a minimum outside turning radius of 52 feet. (IFC D103.3)
9. Dead-end fire apparatus access roads in excess of 150 feet shall be provided with width and turnaround provisions inn accordance with Table D103.4. (IFC D103.4)
10. Gates across fire apparatus access roads shall comply with Appendix D103.5 and Sections 503.4 and 503.5.
11. Buildings four or more stories or 30 feet in height shall have at least two (2) means of fire apparatus access for each structure. (IFC D104.1).
12. Buildings exceeding 62,000 square feet in area shall have at least two (2) means of fire apparatus access for each structure. (IFC D104.2).
13. Where two (2) fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses. (IFC D104.3)
14. Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet *approved* aerial fire apparatus access roads shall be provided. (IFC D105.1)
15. When aerial fire apparatus access roads are required, aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet, exclusive of shoulders, in the immediate vicinity of the building or portion thereof. (IFC D105.2)
16. When aerial fire apparatus access roads are required, one or more of the required access routes meeting this condition shall be located not less than 15 feet and not greater than 30 feet from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the *fire code official*. (IFC D105.3)
17. When aerial fire apparatus access roads are required, overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the aerial fire apparatus road and the building. Other obstructions shall be permitted to be placed with the approval of the *fire code official*. (IFC D105.4)

Fire Protection Water Supplies

1. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises on which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction. (IFC 507.1)
2. The number of fire hydrants available to a building shall be not less than the minimum specified in Table C102.1. (IFC C102.1)
3. Fire hydrant systems shall comply with Washoe County Standard Detail W-23 and IFC Sections 507.5.1 through 507.5.6. (IFC 507.5 / Washoe County Code)
4. Fire hydrants must be spaced at a maximum separation of 500 feet along the required apparatus access lane in residential areas and 1,000 feet where not required for structures to provide for transportation hazards. Hydrant spacing may be increased by 125 feet if all structures within the development are provided with fire sprinkler protection. There is no allowable increase for hydrants installed for transportation hazards. (IFC Table C102.1)
5. In developments with R-3 occupancies, where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 600 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official. (IFC 507.5.1)
6. Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants. (IFC 507.5.4)
7. A 3-foot minimum clear space shall be maintained around the circumference of fire hydrants, as measured from the furthest edge of a fire hydrant in any direction. (IFC 507.5.5)
8. Fire hydrants shall not be located within six feet of a driveway, power pole, or light standard. (IFC 507.5.6)
9. Fire hydrants shall be located adjacent to apparatus access lanes and a minimum of four feet and a maximum of seven feet from back of curb. Provide a detail on the plans. (IFC 507.5.6)
10. Fire hydrants shall have a concrete pad around the base in accordance with Washoe County Standard Detail W-23.

International Wildland-Urban Interface Code

1. All parcels located in other than a Low Hazard WUI Rating shall comply with all provisions of the IWUI as adopted and amended by TMFPD and Washoe County Building.

2. The IWUI Fire Hazard designation for your project is available on the provided Washoe Regional Mapping System link. (https://gis.washoecounty.us/wrms/firehazard). After you have found your property using the address search feature, the color of the background area will indicate your wildland fire risk.
3. When you have determined your Fire Risk Rating use the link provided, to determine the *IWUIC* construction and defensible space requirements. (https://www.washoecounty.us/building/Files/Files/2012%20WUI%20CODE%20GUIDE_rev%2011-25-13.pdf).

Hazardous Materials

The proposed project states that it will use 720,000 gallons of pentane which equates to 376,264.24 pounds and therefore exceeds the threshold quantity for this chemical in NAC 459.9533. Hazardous materials storage, use, and handling shall comply with the 2018 IFC and all associated Referenced Standards.

Fire Protection Report

Due to the complexity of this facility, a Fire Protection Report (FPR) prepared by a Nevada licensed Fire Protection Engineer shall be required, in accordance with IFC 104.12, to be submitted and approved to TMFPD prior to construction of any tanks or vessels for the storage of chemicals deemed hazardous materials by the 2018 IFC. The FPR shall include a description of the facility, construction types, occupancy and use groups, and how fire protection will be provided for the facility.

WASHOE COUNTY
COMMUNITY SERVICES
INTEGRITY COMMUNICATION SERVICE

P.O. Box 11130
Reno, Nevada 89520-0027
Phone: (775) 328-3600
Fax: (775) 328-3699

August 4, 2020

TO: Dan Cahalane, Planner, CSD, Planning & Development Division

FROM: Vahid Behmaram, Water Rights & Water Resources Consultant, CSD

SUBJECT: Special Use Permit Case Number WSUP20-0013 (Ormat Geothermal)

Project description:

The applicant is proposing to approve 1) the establishment of an energy production, renewable use type for two 24mW geothermal power plans, 2) major grading for 189.9 acres of ground disturbance, 200,000cy of excavation, and 3) request to vary landscaping standards.
Project located at: Well Heads – approximately 10 miles north of Pyramid Lake, Transmission Line – approximately 10 miles east of the southern tip of Pyramid Lake south to the border of Washoe County.

Assessor's Parcel Numbers: 079-170-02, 079-180-02, 079-180-12, 079-180-45, 079-570-01, 079-570-07, 079-570-13, 079-320-12, 079-320-18, 071-070-13, 071-070-09, 071-070-12, 071-070-16, 071-070-18, 079-320-04, 071-030-06, 071-060-18, 071-030-07, 079-170-39, 079-180-34, 079-180-37, 079-180-44, 079-320-42, 079-320-47, 079-320-52, 079-320-55, 079-570-02, 079-570-06, 079-570-12, 071-070-19

The Community Services Department (CSD) recommends approval of this project with the following Water Rights comments & conditions:

Comments: The application provides a list of 4 water rights permit with an annual consumptive use duty of 942 acre-feet in support of the proposed power plant and an existing power plant for cooling and other industrial needs. Per personal communication with Ormat staff, the proposed plant is an air-cooled plant, with minimal annual water demand (less than an acer-foot) associated with their offices. Most of the water rights are associated with the adjoining sister power plant. Upon full operation of this facility, and as part of the terms of the water rights permits, the applicant will be required to submit quarterly water meter data to the State Engineer's office. This process will ensure that the applicant does not exceed their permitted duty, and if they do, the State Engineer will require corrective measures or acquisition of additional water rights.

Recommend approval of the Special Use Permit based on the water rights information submitted with the application.

STEVE SISOLAK
Governor

STATE OF NEVADA

BRADLEY CROWELL
Director

TIM WILSON, P.E.
Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES
901 South Stewart Street, Suite 2002
Carson City, Nevada 89701-5250
(775) 684-2800 • Fax (775) 684-2811
http://water.nv.gov

June 26, 2020

RE: Comments on WSUP20-0013 and 21082-T

To: Dan Cahalane
Washoe County Community Services Department
1001 East Ninth Street, Building A
Reno, NV 89512

Name: ***North Valleys Geothermal Development Project***

County: Washoe County – North of Fernley, West of the intersection of Highway's 446 & 447

Location: A portion of Townships 21 & 22 North, Range 25, East, MDB&M.

Plat: Tentative: Twenty-eight lots totaling approximately 2,414 acres.

Water Service Commitment Allocation: Construction water will be available from existing permitted wells.

Owner-Developer: ORNI 36, LLC
6140 Plumas Street
Reno, NV 89519

Engineer: Wood Rodgers, Inc.
1361 Corporate Boulevard
Reno, NV 89502

Water Supply: Permitted wells.

General: There are no active water rights appurtenant to the described lands in this proposed project. The lands of the proposed project do not lie within any municipal service area. Any water used on the described lands should be provided by an established utility or under permit issued by the State Engineer's Office.

Geothermal water is subject to NRS 534A rules and regulations. This project lies within Basin 81, Pyramid Lake Valley.

All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Statutes (NRS), and not otherwise.

Any water or monitor wells, or boreholes that may be located on either acquired or transferred lands are the ultimate responsibility of the owner of the property at the time of the transfer and must be plugged and abandoned as required in Chapter 534 of the Nevada Administrative Code. If artesian water is encountered in any well or borehole it shall be controlled as required in NRS § 534.060(3).

A permit to appropriate the geothermal water of the state of Nevada must be presented to the State Engineer for approval and signed through his office prior to development.

Action: Approval of ***North Valleys Geothermal Development Project*** will be based on permitted water granted by the Division of Water Resources.

Best regards,

Steve Shell

Steve Shell
Water Resource Specialist II

DocuSign Envelope ID: 9C6450CE-6D53-4869-9382-D192E6D0F2C9

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

STEVE SISOLAK
Governor

KRISTINA L. SWALLOW, P.E., *Director*

June 26, 2020

Washoe County Community Services Department
Planning and Building Division
1001 East 9th Street
Reno, NV 89512
Attention: Dan Cahalane, Planner

RE: WSUP20-0013 – Ormat Geothermal

Dear Mr. Cahalane,

Nevada Department of Transportation (NDOT) staff has reviewed the following application and provided comments:

Special Use Permit Case Number WSUP20-0013 (Ormat Geothermal) – For possible action, hearing, and discussion to approve 1) the establishment of an energy production, renewable use type for two 24mW geothermal power plans, 2) major grading for 189.9 acres of ground disturbance, 200,000cy of excavation, and 3) request to vary landscaping standards.

NDOT comments:

1. The project proposes a transmission line crossing of State Route 447 (SR-447) at APNs 071-030-06 and 071-030-07. SR-447 is a NDOT owned and maintained roadway that is functionally classified as a major collector.

    a. NDOT will require an occupancy permit for the transmission line crossing within the NDOT right of way. Please contact the NDOT District II Permits Office at (775) 834-8330 for more information relating to obtaining occupancy permits.

    b. All work constructed within the NDOT right of way will be required to comply with the NDOT Standard Plans and Terms and Conditions Relating to Right-of-Way Occupancy Permits, current at the time of application.

2. The project proposes to use existing dirt approaches to SR-447 for project access during construction and after full build-out.

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a. The applicant will be required to submit a trip generation document or traffic study to NDOT showing how many vehicle trips are generated during the construction phase and after full build-out of the project.

b. Based on the vehicle trips generated by the project, permanent or temporary mitigation measures may be required to reduce project impacts to the State highway system.

3. The State defers to municipal government for land use development decisions. Public involvement for community development related improvements within NDOT right of way should be considered during the municipal land use development process. Significant improvements proposed within NDOT right of way may require additional public involvement. It is the responsibility of the applicant to perform such additional public involvement.

Thank you for the opportunity to review this application. NDOT reserves the right to incorporate further changes and/or comments as these applications and design reviews progress. Should you have any questions, please contact Alex Wolfson at (775) 834-8365.

Sincerely,

DocuSigned by:
F9FB080A68BF478...

Tara Smaltz, PE
Engineering Services Manager
NDOT District II

TMS:alw

Cc: Sondra Rosenberg, PTP – NDOT Assistant Director of Planning
Mike Fuess, PE, PTOE – NDOT District Engineer
Craig Reynoldson – NDOT Right of Way
Alex Wolfson, PE – NDOT Traffic Engineering
Marlene Revera – NDOT Administration
File

Cahalane, Daniel

From: Kenneston, Aaron
Sent: Wednesday, July 15, 2020 3:59 PM
To: Cahalane, Daniel
Cc: Echeverria, Kelly
Subject: Emergency Management Review of Special Use Permit WSUP20-0013 (Ormat Geothermal)
Attachments: July Agency Review Memo I.pdf

Dan,

Thank you for the opportunity to review the subject permit application. From my perspective, the applicant has exercised due diligence and has appropriately addressed the appropriate emergency management issues. Mitigation measures have been considered for the identified hazards of earthquake, flooding, as well as hazardous materials. I have recommended that the Gerlach Fire Department conduct a site visit at a time agreeable to the applicant to review emergency response procedures.

Aaron R. Kenneston, CEM
Washoe County Emergency Management & Homeland Security Program
akenneston@washoecounty.us
Office: 775.337-5898 |Cell: 775.742.6944
24/7 Staff Duty 775.379.5995
www.Readywashoe.com

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EXHIBIT K

Pyramid Lake Paiute Tribe

P. O. Box 256
Nixon, Nevada 89424
Telephone: (775) 574-1000 / 574-1001 / 574-1002
Fax: (775) 574-1008

July 13, 2020

Tai Subia, Project Lead
Bureau of Land Management
Winnemucca District Office
5100 E. Winnemucca Blvd.
Winnemucca, NV 89445
blm_nv_wdo_sanemidioii@blm.gov

Re: Comments on the Draft Environmental Assessment and the Hydrogeologic Evaluation for the North Valley Geothermal Development Project at the San Emidio Geothermal Field

Dear Ms. Subia:

This letter provides comments on behalf of the Pyramid Lake Paiute Tribe ("Tribe") regarding the Draft Environmental Assessment ("Draft EA") and the Hydrogeologic Evaluation ("Hydro Report") for the North Valley Geothermal Development Project at the San Emidio Geothermal Field ("Project"). The U.S. Bureau of Land Management's ("BLM") reports on the Project are both dated May 2020. The Tribe previously provided initial comments to the BLM on the Scoping Report for the Project and those comments are repeated herein.

The Project has been proposed by USG Nevada LLC, a subsidiary of Ormat Nevada, Inc. (collectively "Ormat"), and seeks to construct two 20 MW closed-loop binary geothermal power plants in the San Emidio Desert of Northern Nevada that would require new geothermal fluid production wells, injection wells, approximately 7.5 miles of above-ground pipelines, and an approximately 58-mile long overhead generation tie powerline.

As shown in Figure A-1 of the Draft EA, the Project is located approximately 3 miles to the northeast of the boundary of the Pyramid Lake Paiute Reservation ("Reservation"). The Project proposes to withdraw groundwater from the San Emidio Basin, which basin extends into the Reservation boundaries. Because of its proximity to the Reservation and its proposal to withdraw water from the San Emidio Basin, the Project will impact Tribal trust resources.

As previously stated, the BLM has unique obligations to consider and protect all Tribal trust resources. *See e.g.* Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments (April 29, 1994); Executive Order No. 13007 (May 24, 1996) (implementing policy to protect and preserve Indian religious practices and sacred sites on federal lands); Secretarial Order No. 3206 (June 5, 1997) (outlining Department of the Interior principles regarding American Indian Tribal Rights,

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Federal-Tribal Trust Responsibilities and the Endangered Species Act); Executive Order No. 13175 (November 6, 2000) (Consultation and Coordination with Indian Tribal Governments); Secretarial order No. 3342 (October 21, 2016) (Identifying Opportunities for Cooperative and Collaborative Partnerships with Federally Recognized Indian Tribes in the Management of Federal Lands and Resources). Pursuant to these and other authorities, the Tribe will by separate correspondence request formal government-to-government consultation with the Bureau with respect to the Project, and its impacts on Tribal trust resources.

The Tribe has identified several concerns and questions regarding the Project. First, the Tribe is concerned with impacts to its federal reserved groundwater rights within the Reservation boundary. A portion of the Reservation overlies the groundwater and geothermal resources in the San Emidio Desert Basin. The Tribe has federal reserved rights to the resources, including geothermal and underground water, within the San Emidio Basin.

The groundwater reservoir in the area is at shallow depths with relatively poor quality. The groundwater quality would deteriorate further with the additional pumping for the Project. Any additional exploitation of groundwater under the proposed Project would lower the water table, and possibly recede, underneath the Reservation lands within the San Emidio Desert Basin. This would result in the loss of an irretrievable resource to the Reservation and the Tribe.

In addition to the decline and receding of the water table, there would be impacts to springs on the Reservation within the San Emidio Basin. The area is inhabited by wildlife, including sage grouse, and tribally-protected Big Horn Sheep. Tribal members utilize the rangelands in the Lake Range for cattle grazing, for many of whom this is their sole source of income. These springs are essential to maintain the vegetation on the rangeland habitat as well as streams and wetlands. Any disruption of the water flow in these areas will have a devastating effect on the wildlife and cattle in the area. A complete evaluation of the well construction, groundwater and thermal water movement, and impact to the Tribe's Trust resources must be evaluated. The increased pumping could also result in reversing the groundwater gradients from the playa and older alluvial deposits into fresh water zones. In addition to the loss in groundwater storage, there could be land subsidence in connection with the proposed Project.

The proposed 25 geothermal and injection wells for the Project are a significant increase compared to the existing 3.6 MW San Emidio I facility. Most of the proposed new wells would be located near the Reservation. In addition to pumping, the cone of depressions from these proposed new wells would directly impact the Tribe's groundwater and geothermal resources within the Reservation. Most likely, the spent geothermal water would be injected in places that would not offset the cones of depression.

The Bureau should require Ormat to conduct an investigation, including pump tests, hydrological modeling, temperature analysis, among other research, to quantify the Project's impacts—both from withdrawal and reinjection—on the Tribe's federal reserved groundwater rights within the San Emidio Basin, and within other adjacent areas. This investigation should include an analysis of impacts to both the Tribe's geothermal resources and impacts to groundwater in the alluvium.

The Tribe has spent considerable resources exploring and delineating the geothermal resources with the boundary of the Reservation. The system within the Reservation's boundary is part of the same system found in San Emidio with a shallow thermal aquifer and extensive faulting that intersects the groundwater. The most promising area for geothermal development for the Tribe has been located on the northeast sections of the Reservation contiguous to San Emidio. This is illustrated in the major system fault along the Lake Range East Pyramid Lake Fault that displays down-to- the-west motions, and then splays into a series of dextral dip slip faults on the northwest end of the lake. Evidence of faults in this system can be seen on geologic mapping performed by the Tribe during exploration activities.

The existing San Emidio Geothermal Project is located approximately 4.5 miles northwest of the Reservation. The proposed expansion of the Project (nearly ten times its current capacity) by Ormat could adversely impact freshwater and geothermal resources located within the Reservation. Geothermal water at the existing San Emidio facility has a temperature of about 300°F and 4,250 mg/L Total Dissolved Solids. 40 megawatts of electrical generation from a geothermal resource with a temperature of about 300 F will require pumping approximately 80,000 gallons per minute (350 acre feet per day) of geothermal fluid. The pumping and injection of the geothermal waters will be conducted by a series of 25 wells. The productions wells will extract the geothermal waters from the shallow aquifer forming a cone of depression. This will result in reduction and disturbance of the geothermal aquifer, as well as mixing the thermal waters with the groundwater.

The injection of the spent water back into the geothermal aquifer could also have a negative impact on the Tribal trust resources by cooling the geothermal reservoir in the Reservation. The impact of how the injection fluid from this proposed expansion could impact the freshwater and geothermal resource located on the Reservation need to be fully evaluated. The depth and location of proposed injection and production wells need to be examined to determine whether the proposed expansion at San Emidio could have an adverse impact on the resources located on the Reservation. The Tribe would like to see monitoring wells installed along the border of the Reservation in advance of any expansion in order to establish baseline data for this proposed expansion. In addition, the location, depth, schedule and monitoring program of these monitoring wells should be provided to the Tribe for review to ensure the Tribal trust resources are not diminished.

The Tribe is also concerned of the impacts to Pyramid Lake, which is home to two species of fish listed as threatened and endangered under the Federal Endangered Species Act. The Tribe adopts any comments submitted by any governmental fish and wildlife agency regarding the Project, including the U.S. Fish and Wildlife Service.

Lastly, the Tribe is concerned of impacts to cultural sites in the area of the Project, both within and outside of the Reservation boundary. The Bureau should provide the Tribe with an inventory of known cultural sites so that both the Tribe and Bureau can assess the Project's impacts to these important sites.

Based on these concerns, the Tribe requested that the Bureau bypass an Environmental Assessment and instead proceed directly to the development of an Environmental Impact Statement under the National Environmental Policy Act.

In addition to the comments above, comments prepared on behalf of the Tribe by Stetson Engineers and Ehni Enterprises, are attached to this letter. Thank you for considering the Tribe's comments on this project, and we look forward to continued collaboration and consultation.

Sincerely,

Donna Marie Noel, Director
Natural Resources Department
Pyramid Lake Paiute Tribe

Attachments

1. Comments by Stetson Engineers (Technical Memorandum dated July 13, 2020)
2. Comments by Ehni Enterprises Inc. (dated July 13, 2020)

Technical Memorandum

STETSON ENGINEERS INC.

2171 E. Francisco Blvd., Suite K • San Rafael, California • 94901
TEL: (415) 457-0701 FAX: (415) 457-1638 e-mail: allanr@stetsonengineers.com

TO: Donna Noel, Natural Resources Director
Pyramid Lake Paiute Tribe

DATE: July 13, 2020

FROM: Stetson Engineers Inc.

RE: **Comments on the Draft Environmental Assessment and the Hydrogeologic Evaluation for the North Valley Geothermal Development Project at the San Emidio Geothermal Field**

This Technical Memorandum was prepared at the request of the Pyramid Lake Paiute Tribe ("Tribe") and concerns the Draft Environmental Assessment ("Draft EA") and the Hydrogeologic Evaluation ("Hydro Report") for the North Valley Geothermal Development Project at the San Emidio Geothermal Field ("Project"). The U.S. Bureau of Land Management's ("BLM") reports on the Project are both dated May 2020.

The proposed Project is located in the San Emidio Desert Basin, less than two (2) miles from the northeastern boundary of the Pyramid Lake Reservation. The San Emidio Desert Basin is identified by the Nevada State Engineer's Office as Hydrographic Basin No. 22. The location of the Project relative to the Pyramid Lake Reservation, and within the San Emidio Desert Basin No. 22, is shown on **Figure 1** attached to this Technical Memorandum.

The Project seeks to construct two 20 MW closed-loop binary geothermal power plants in the San Emidio Desert that would require twenty-five (25) new geothermal fluid production wells, injection wells, approximately 7.5 miles of above-ground pipelines, and an approximately 58-mile long overhead generation tie powerline. The proposed Project boundary (referred to as the "Area of Interest" in the EA) and the locations of the proposed Project wells are shown on **Figure 2** attached to this Technical Memorandum. As shown on Figure 2, the Project boundary is only 8,450 feet from the Reservation and the nearest proposed Project well is only a little more than 3 miles from the Reservation. Notably, a significant portion of the San Emidio Desert Basin extends into the Reservation. More than 23,000 acres of the San Emidio Desert Basin is within the Reservation.

Comment #1 (EA and Hydro Report Fault Mapping)

The EA does not provide a map showing the fault systems in the vicinity of the proposed Project. Figure 3 of the Hydro Report does show the location of some faults in relation to the proposed Project, including references to Lake Range, San Emidio, and Empire Faults. As generally illustrated on Figure 3 of the Hydro Report, the Lake Range fault extends from the Pyramid Lake into the San Emidio Desert Basin and the proposed Project area. However, Figure 3 of the Hydro Report does not correctly represent the full extent of the fault identified as the San Emidio Fault.

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The full extent of the faults extending from the Pyramid Lake into the San Emidio Desert Basin are provided on Figure 2 attached to this Technical Memorandum (faults in Figure 2 are based on USGS, 2007). As shown on the attached Figure 2, there are two faults that extend from the Pyramid Lake into the San Emidio Desert Basin. The southernmost fault extends from the Pyramid Lake through the San Emidio Canyon and a second fault to the north extends from the Pyramid Lake through the Sweetwater Canyon/Stag Canyon. Both faults extend from Pyramid Lake into the San Emidio Desert and the geothermal production area associated with the proposed Project. Figure 3 in the Hydro Report should be corrected to accurately show both faults extending from the Pyramid Lake into San Emidio Desert Basin.

Comment #2 (EA, Section 3.2.1 Water Resources, page 3-7)

The EA includes two (2) paragraphs under the heading "**Water Budget**." However, a water budget is missing from this section of the report. The Water Budget section of the report discusses an annual estimate of 4.2 inches of precipitation per year for the San Emidio Basin, cites 7,186 acre-feet of existing groundwater usage in the basin, and states the basin perennial yield is 4,600 acre-feet per year. The second paragraph of the section entitled Water Budget concludes with the statement: "*It can be inferred that the excess recharge due to precipitation is counterbalanced by discharge due to groundwater uses and water uptake by vegetation.*" The EA should provide a proper analysis for a water budget and explain how the proposed Project will affect the existing water budget.

Comment #3 (Hydro Report, Section 3.3.1 Water Budget, page 3-2)

The EA relies on the Hydro Report for most of the conclusions that the proposed Project will not affect the environment, water resources, vegetation, wildlife, and cultural resources. Section 3.3.1 of the Hydro Report is entitled "Water Budget" and it, like the Water Budget section of the EA, does not provide an actual water budget analysis or a discussion of how the proposed Project will impact the existing water budget for the San Emidio Desert Basin. Section 3.3.1 of the Hydro Report correctly notes that the perennial yield of the San Emidio Desert Basin is 4,600 acre-feet annually, and correctly notes that the Nevada State Engineer has permitted 7,296 acre-feet of groundwater to be pumped from the basin annually (not including 1,303 acre-feet of additional permitted pumping from geothermal groundwater). The Hydro Report also correctly notes that the San Emidio Desert Basin is a "designated basin," meaning it is over depleted and in need of additional administration by the State Engineer. However, the Hydro Report fails to explain/justify/reconcile how the proposed Project could not adversely affect the already over-committed groundwater resources of the San Emidio Desert Basin.

Comment #4 (Hydro Report, Section 3.3.3 Surface Water, San Emidio Desert, page 3-7)

The Hydro Report states that there are three perennial springs within 5 miles of the Project area with a reference to Hydro Report Table 4. Table 4 in the Hydro Report does not appear to list any springs. Furthermore, there are several other springs within the portion of the Reservation that extends into the San Emidio Desert Basin that are not mentioned in the Hydro Report. Figure 2 attached to this Technical Memorandum shows springs in the San Emidio Basin (on the Reservation) that should be included in the Hydro Report.

Comment #5 (Hydro Report, Section 3.3.3 Surface Water, Pyramid Lake, page 3-7)
The Hydro Report states that the waters of the Pyramid Lake are hydrologically distinct from the surface and groundwater resources north of the Pyramid Lake basin, including the San Emidio Desert, based on TDS, salinity, and pH levels of the Pyramid Lake water. This statement is made without scientific bases and does not recognize the various sources of water that contribute to TDS, salinity, and pH in the Pyramid Lake that are not present as contributing sources to the San Emidio surface and groundwater resources.

Comment #6 (Hydro Report, Section 3.4 Existing Water Rights, page 3-7)
Section 3.4 of the Hydro Report makes reference to a table of existing water rights and a figure showing existing points of diversion within the San Emidio Desert Basin, presumably derived from data/information published by the Nevada Department of Water Resources. However, the Hydro Report fails to recognize or mention the Tribe's federal reserved rights to the resources of the San Emidio Desert Basin, including geothermal and shallow groundwater, underlying the portion of the Reservation that is within the San Emidio Basin.

Comment #7 (Hydro Report, Section 3.5 Jurisdictional Water, page 3-7)
Section 3.5 of the Hydro Report refers to *"…approximately 115 acres of freshwater emergent wetlands that may be present on the floor of the San Emidio Desert…[that] may be considered jurisdictional Wetlands and Other Waters of the US by the US Army Corps of Engineers"* and concludes that coordination with the USACE would be necessary to determine the jurisdictional status of the wetlands. However, Table 3-2 of the EA shows that *"Wetlands – Riparian Zones are* ***Not Present.*** *A project area habitat inventory (BLM 2020a) determined that wetlands and riparian areas are not present."* The conflicting statements made in the EA and the Hydro Report concerning the existence and status of wetlands and riparian areas should be reconciled.

Comment #8 (EA, page 3-35)
The EA erroneously states: *"…connectivity between the geothermal resources in the San Emidio Desert and adjacent undeveloped geothermal resources is unlikely. Proposed geothermal utilization, including reinjecting cooled geothermal fluids, is not anticipated to affect adjacent geothermal resources or the possibility of developing these resources in the future."* Referring to Figure 2 attached to this Technical Memorandum, clearly the use of well water, geothermal well water production, and reinjection of geothermal well water at the proposed Project site will likely have impacts on the Tribe's undeveloped geothermal resources in the San Emidio Desert Basin. The resources underlying the portion of the Reservation that extends into the San Emidio Desert Basin are part of the same resources associated with the proposed Project.

Comment #9 (EA, page 3-53)
The following comment is made in the EA in regard to cumulative effects:
"Because there is a lack of connectivity between the geothermal resource in the San Emidio Desert Basin and undeveloped geothermal resources in adjacent hydrologic basins, Alternative A is not anticipated to prevent development of these resources in the future. Similarly, there is no direct connection between the geothermal resources in the San Emidio Desert and groundwater and surface water resources in the Pyramid Lake Valley basin; thus, there would be no contributions to cumulative effects on water quality or quantity in Pyramid Lake, including habit for listed fish species."

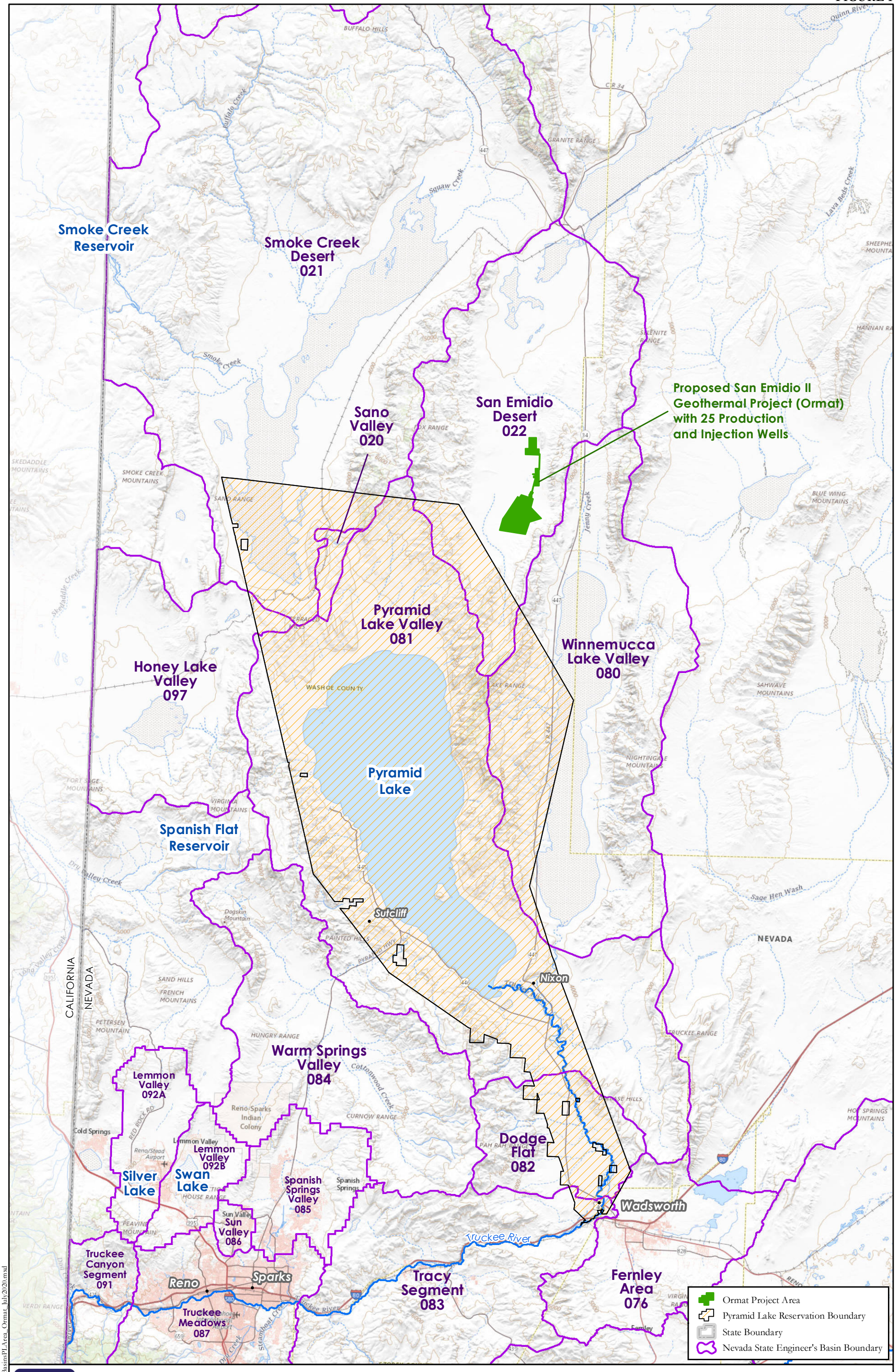
There is no conclusive scientific bases or analyses in either the EA or the Hydro Report to support these statements. The capacity and extent of the geothermal resource from which the proposed Project will withdraw from are not stated, quantified, or otherwise illustrated in either the EA or the Hydro Report. The analyses and information that are provided in the Hydro Report conflict with the statements that are made regarding no effects.

Comment #10 (EA, Section 3.3.6 Cumulative Effects, page 3-53)

The Hydro Report states that the current San Emidio geothermal plant and northern production wells are associated with the San Emidio fault (Hydro Report, page 4-5). The Hydro Report also states that the geothermal system is likely produced by conductive faults that provide pathways for fluid convection (Hydro Report, "Proposed Project" page 4-11). As shown in Figure 2 attached to this Technical Memorandum, there are two (2) faults that extend from the Pyramid Lake into the San Emidio Desert Basin and into the area proposed for geothermal well production. Based on the fault connectivity that exists between the Pyramid Lake and the proposed geothermal production area in the San Emidio Desert Basin, the following conclusion as stated in the EA is unsupported and contradicted by the facts:

> *"Because there is a lack of connectivity between the geothermal resource in the San Emidio Desert Basin and undeveloped geothermal resources in adjacent hydrologic basins, Alternative A [the proposed Alternate] is not anticipated to prevent development of these resources in the future. Similarly, there is no direct connection between the geothermal resource in the San Emidio Desert and groundwater and surface water resources in the Pyramid Lake Valley basin; thus there would be no contributions to cumulative effects on water quality or quantity in Pyramid Lake, including habitat for listed fish.* (EA, page 3-53).

FIGURE 1



Document Path: J:\jn1336\BasinsPLArea_Ormat_July2020.mxd

STETSON ENGINEERS INC.

7/13/2020

HYDROGRAPHIC BASINS IDENTIFIED BY THE NEVADA DIVISION OF WATER RESOURCES IN THE VICINITY OF PYRAMID LAKE

N

0 2.5 5 Miles

WSUP20-0013
EXHIBIT L

San Emidio Desert Basin 22

PYRAMID LAKE RESERVATION

Pyramid Lake

Spring
Proposed Well
Known fault
Inferred fault
Concealed fault
Ormat Project Area
Pyramid Lake Reservation Boundary
Nevada State Engineer's Basin Boundary

STETSON ENGINEERS INC.

7/13/2020

Geologic Faults from:
Crafford, A.E.J., 2007, Geologic Map of Nevada:
U.S. Geological Survey Data Series 249, 1 CD-ROM, 46 p., 1 plate.

PROPOSED SAN EMIDIO II GEOTHERMAL PROJECT (ORMAT)

N

0 2,500 5,000 Feet

Document Path: F:\jnl336\Proposed_San_Emidio_Project.mxd

WSUP20-0013
EXHIBIT L

Ehni Enterprises, Inc.
GEOLOGIC CONSULTING, PROSPECTING, & EVALUATION
P. O. BOX 4228, CARSON CITY, NEVADA 89702-4228
(775) 883-1107 email:ehnient@aol.com

13 July 2020

Comments on the Environmental Assessment (EA) and Hydrogeologic Evaluation for the North Valley Geothermal Development Project at the San Emidio Geothermal Field (Reports dated May 2020)

To
BLM-Black Rock field office
Attn: Tai Subia (NVW010.28)
Bureau of Land Management
Winnemucca District Office
5100 E. Winnemucca Blvd.
Winnemucca, NV 89445.

Via Electronic Mail
blm_nv_wdo_sanemidioii@blm.gov,

Please accept the following comments on Environmental Assessment ("EA") DOI-BLM-NV-W030-2020-0003-EA regarding the draft EA on North Valley Geothermal Development Project at the San Emidio Geothermal Field. These review comments are prepared on behalf of the Pyramid Lake Paiute Tribe (PLPT) by Wm. J. Ehni, consulting geologist.

The EA and supporting documents have numerous deficiencies as outlined below. In addition, the proposed project could seriously endanger PLPT's valuable geothermal and water resources. The areal extent of the geothermal resource is poorly defined and open ended to the southwest, and most likely extends onto the PLPT reservation. The EA erroneously discounts the affect that the proposed development will have on the PLPT resources by making numerous references stating that the "The groundwater systems in the San Emidio Desert are not interconnected to those in the Pyramid Lake Valley groundwater basin" while nearly 23,500 acres (over 36 square miles) of the PLPT reservation lies within the San Emidio Desert ground water basin. Freshwater resources belonging to the PLPT could be adversely affected if the proposed development is mismanaged. Based on the above, and as well as the impact of other geothermal developments that were mismanaged and adversely impacted the freshwater and or geothermal resources, the proposed development will need a robust monitoring program coordinated by the PLPT.

The EA discusses the link between faults and geothermal systems however fails to present maps that show the location of these faults. The supporting documents of the EA and Hydrogeologic Evaluation indicate that the geothermal system at San Emidio extends to the southwest as noted by Warren (2018) where he states "drilling south of the producing field discovered a new, hotter (>160C) resource that is

currently in the early development stages" and this area coincided with the Sweetwater fault that extends onto the PLPT Reservation (see Figure 1 by Wm. J. Ehni). Geologic mapping clearly links the Lake Range Fault on the east side of Pyramid Lake with the production faults at the San Emidio geothermal project (Crafford 2007, Faulds et al 2013, Anderson and Faulds 2013, Moore 1979) as indicated on the attached map by Ehni (Figure 1). San Emidio geothermal production wells are located adjacent to the north end of the Lake Range (Mackelprang and More 1979) which extends south where the Lake Range forms the eastern side of Pyramid Lake. The fault system associated with the San Emidio geothermal system is the northern extension of accommodation faults related to the Lake Range Fault. The Lake Range Fault is a right lateral, right stepping west dipping normal fault. The producing faults at San Emidio are a northern extension of this fault. The Lake Range Fault splays off to the north on the Sweetwater and Hell's Kitchen faults which are most likely extensional accommodation (tensional) faults and are probably the primary fault system that is being produced at the San Emidio geothermal project.

There are four hydrologic systems that could be impacted by the proposed geothermal development at San Emidio. (1) Subsurface freshwater ground water aquifers could be damaged by overproduction and or poorly designed wells. (2) Surface water (and springs) could be impacted by over production. (3) Known geothermal systems in the Pyramid lake basin might be affected and (4) undeveloped geothermal resources that might exist along the Sweetwater fault on the PLPT Reservation in the San Emidio basin could be significantly affected by the proposed development. The water table in the San Emidio basin is at a higher elevation than the surface of Pyramid Lake and if producing the geothermal resource at San Emidio resulted in lowering the water table below the surface elevation of Pyramid Lake, water in Pyramid Lake might be affected. In 1988, one year after the San Emidio power plant went on production, the water table in the San Emido basin was at an elevation of about 4044 feet above sea level, 6 feet below ground level (AMOR II, 1988). By 1994 it had dropped to an elevation of 3923 feet above sea level, 142 feet below ground level (Pruett 1994). The elevation of pyramid lake is 3792 feet above sea level and therefore the hydrologic gradient is from San Emidio into Pyramid lake. Isothermal intervals in geothermal wells in San Emidio and on the PLPT reservation, are convective zones with relatively high fracture connectivity and permeability (Reeves et al., PLPT). Permeable Vocaniclastic rocks at San Emidio (Mesquite 1994, pg 28) could also provide communication between Pyramid Lake and San Emidio.

Wood (1990) recognized the Lake Range Fault as separating Wind Mountain from the Lake Range just north of the San Emidio geothermal project. The Fault zone that produces geothermal fluids at San Emidio is just west of the Lake Range fault, in a similar structural setting to the Wind Mountain Fault as described by Wood in 1990. The Sweetwater Fault zone appears to be a southern extension of the Wind Mountain / San Emidio fault zone, connecting Pyramid Lake with San Emidio.

The Hydrogeologic Evaluation is fraught with numerous errors and false statements. One example is found on page 4-4 where it states that at Emerson Pass "In 2013, the Nevada Bureau of Mines and Geology drilled four shallow wells, from 140 to 250 feet deep. The bottom hole temperatures ranged from approximately 205 to 298˚". These are false and erroneous statements, the Nevada Bureau of Mines and Geology did not drill these holes, the Pyramid Lake Paiute Tribe did, and there are no wells with temperature as high as 298F.

1) Map showing the cumulative effect study area (CESA) is missing

Maps showing the cumulative effect study area(s) are emphasized in the National Environmental Policy Act (NEPA), particularly in section 5 of "cumulative effects"
https://ceq.doe.gov/publications/cumulative_effects.html
and are totally missing from the EA or Hydrogeologic Evaluation. Figure 1 of the Hydrogeologic Evaluation shows a 5 miles buffer area around the Area of Interest (AOI) which is arbitrary and misses several areas that might be affected by the project.

2) The EA fails to identify where the San Emidio Geothermal unit is located.

On page 1-1 in Chapter 1, the EA states: "***The Project proposes geothermal development in the San Emidio Geothermal Unit (SEGU; NVN-85820X), which encompasses approximately 20,400 acres."***

However, on figure A-2, the outline of the San Emidio Geothermal Unit barely encompasses 13,440 acres. The BLM serial page agrees with the unit size of being 20,400 acres, so Figure A-2 must be wrong and a map showing where the unit is needs to be included in the EA. And there is no mention of the Unit geology supporting this geothermal unit.

3) The EA fails to accurately explain how much production and injection is being proposed

On page 2-3, the EA states: "***Ormat is proposing 25 production and injection wells,…..***
During normal well field operations, total geothermal fluid production rates are expected to be approximately 8,400 gallons per minute (gpm) at 320 degrees Fahrenheit. Individual production well flow rates are expected to be approximately 4,200 gpm…. Individual injection wells are expected to receive approximately 2,600 gpm". This math doesn't add up, total field production for 48 mega watts will be closer to 34,000 gpm, not 8,400 gpm. At 320F it will take about 17,000 gpm to produce 24 Mega Watts (gross) for each plant, which will only require 4 production wells at 4,200 gpm. And in order to reinject all 17,000 gpm at 2,600 gpm per well only 6 wells or so would be required. In order to fully assess the environmental impact, PLPT needs to have a better understanding of how much fluid is being produced and injected. In addition it is not clear if the old plant be decommissioned?

4) The EA failed to adequately discuss the potential impact on wetland and riparian areas.

In Table 3-2, the EA makes a false statement that wetlands and riparian zones are "***Not Present A project area habitat inventory (BLM 2020a) determined that wetlands and riparian areas are not present"***. The biological baseline resource document (BLM 2020a) does not mention wetlands and the discussion of riparian areas is inadequate. Section 3.5 of the Hyrdrogeologic Evaluation refers to the wetlands that exist just west of the existing facility and riparian areas exist around perennial springs in the area.

5) The EA erroneously dismisses the possibility for possible adverse impacts to Endangered species.

On page 3-6 in Table 3-2, the EA states **"No threatened, endangered, candidate, or proposed species or designated critical habitat are present in or near the project area and would therefore not be affected by Alternative A (BLM 2020a)."** This statement is not supported by any factual information. And then this section continues with saying "**There were concerns raised during scoping regarding the potential connectivity of the San Emidio geothermal reservoir and surface water in Pyramid Lake and that Alternative A could affect Lahontan cutthroat trout and cui-ui in Pyramid Lake. See analysis for Issue 2 (Section 3.3.3) and the Hydrogeologic Evaluation (BLM 2020b), which indicate that geothermal fluid flows northward following fault structures along the eastern boundary of the San Emidio Valley and there is no connectivity between the San Emidio geothermal reservoir and Pyramid Lake. Accordingly, Alternative A would have no potential to affect threatened or endangered species in Pyramid Lake or the Truckee River."** Not all of the springs in the area have been inventoried for endangered species and the research presented in BLM 2020a is not conclusive that there is not any hydrologic communication between San Emidio and Pyramid Lake. Especially since the water table in San Emidio is higher than the surface level of pyramid lake, it would seem that the hydrologic gradient would flow toward Pyramid Lake. On Page 4-1 the EA discounts the possibility of any endangered species be affected by the proposed development with this statement: "***Current surveys have indicated that ESA-listed species are not found in the project area."*** Since the EA only recognized 3 springs in the area and in reality there are several more, recognized in this EA, it would appear that the other springs that have not been inventoried in this EA might have endangered species inhabiting them, such as mollusks (snails).

6) The EA fails to identify all surface waters that might be affected the proposed action.

On page 3-7, the EA states "***Three springs are present within 5 miles of the AOI. These include Rodeo Creek, Chimney Spring, and Painted Rock Spring".*** This statement is wrong. Sheep Pass Spring is 3.6 miles from the project area and not included in this inventory. Stag Spring is 5 miles from the project area and San Emido Spring is about 5.2 miles from the project area. All three of these springs are on the PLPT Reservation. In addition there are other springs in the area that are within 5 miles of the project area that are not included in this inventory. On Page 3-33; the EA states "***Effects on surface water quality are unlikely because there are no perennial streams or other surface waters in the project area."*** This statement is erroneous; there are perennial springs within the project area.

7) The EA makes misleading statements regarding the potential impact on Pyramid Lake

On Page 3-35; the EA states "***As described in the Hydrogeologic Evaluation (2020b), connectivity between the geothermal resource in the San Emidio Desert and adjacent undeveloped geothermal resources is unlikely. Proposed geothermal utilization, including reinjecting cooled geothermal fluids, is not anticipated to affect adjacent geothermal resources or the possibility of developing these resources in the future. Similarly, there is no direct connection between the geothermal resource in the San Emidio Desert and groundwater and surface water resources in adjacent hydrographic basins such as the Pyramid Lake Valley groundwater basin (Basin 81); thus, Alternative A is not anticipated to have effects on groundwater or surface water quality or quantity in adjacent hydrographic basins or on Pyramid Lake."*** It has not been demonstrated or proven that there is no connection between the San Emidio groundwater basin and Pyramid Lake. The EA infers that there is no "direct" communication between San Emidio and the Pyramid Lake, but there is no data on how is this measured except for indirect conclusions made from geophysical data. Although communication between San Emidio and Pyramid Lake might not be "direct" with obvious surface drainage from San Emido to Pyramid Lake, there is most likely some communication because Pyramid Lake is the low point and fault communication between San Emidio and Pyramid Lake is obvious.
In 1988, one year after the San Emidio power plant went on production, the water table was at an elevation of about 4044 feet above sea level, 6 feet below ground level (AMOR II, 1988). By 1994 it had dropped to an elevation of 3923 feet above sea level, 142 feet below ground level (Pruett 1994). The elevation of pyramid lake is 3792 feet above sea level and therefore there is probably a significant amount of recharge and communication of water from San Emidio into Pyramid lake. If the water table in San Emidio is dropeed below 3792 feet, the hydrologic gradient would be from Pyramid Lake to San Emidio.
On Page 3-36; the EA makes a similar statement; "***The groundwater systems in the San Emidio Desert are not interconnected to those in the Pyramid Lake Valley groundwater basin (Basin 81)."*** The connection between San Emidio and Pyramid Lake has not been fully evaluated. Faulting connects the two basins and how much permeability there is along these faults has not been determined.
On Page Page 3-37; the EA states "***The currently producing geothermal reservoir at the SEGU and the geothermal reservoirs south of the unit on the PLPT Reservation do not interconnect (BLM 2020b). This indicates that proposed geothermal utilization would not affect the PLPT's ability to develop the geothermal resource on the reservation in the future."*** Although BLM 2020b (Hydrogeologic Evaluation) implies that the geothermal systems are separate, the evidence is indirect and inferred from geophysical interpretations. Communication between the two basins might occur along the Sweetwater fault and Hell's Kitchen fault. Both of these fault systems are dilational "transitional pull apart" zones similar to example G on Figure 6 of in the Hydrologic Evaluation report (BLM 2020b). Unknown geothermal resources probably exist in the area, especially within the PLPT reservation in the San Emido Basin. Sacred hot springs at the "Pyramid" in Pyramid Lake are on the Lake Range Fault, which extends all of the way up to San Emidio, and the hydrology of this system in not very well understood.

8) The Hydrogeologic Evaluation does not include all Springs within the AOI.

The Hydrologic baseline data in the report did not include included or characterize all freshwater surface sources and subsurface groundwater well data in the project area. On page 3-7 the reports states that

"Three perennial springs are present within 5 miles of the Project area: Rodeo Creek, Chimney Spring, and Painted Rock Spring (see **Table 4**)". This statement is erroneous, Sheep Pass Spring on the PLPT reservation is only 3.6 miles from the project area and Jackass spring is only 4 miles west of the AOI. Stag Spring is 5 miles from the project area and San Emido Spring is about 5.2 miles from the project area both of which are within the San Emidio hydrologic basin and located on the PLPT reservation. In addition, Table 4 has nothing to do with Springs. Although Stag and San Emido springs are just outside of the arbitrary 5-mile buffer (Figure 1 of Hydrogeologic Evaluation), they should be included the Hydrogeologic study since they are within the San Emidio hydrologic basin and could be affected by the proposed activity.

9) The Hydrogeologic Evaluation lacks critical water table data.

The report failed to include historical data showing how much draw down in the water table has occurred during the production of the existing power plant. In addition, water table data in Table 3 is blacked out. To make a complete Environmental Assessment, the current water table elevations need to be included for baseline data for all existing wells (production, injection, and freshwater wells) within the cumulative effects study area (CESA). Historical data on all wells (water table when first drilled and subsequent measurements) should be included to evaluate how much draw down in the water table has occurred with the current facility. The Hydrologic Evaluation also states that "There is also no evidence that geothermal water or groundwater is connected with geothermal or groundwater resources outside the San Emidio basin" (page ES2). However, the faulting that controls the San Emidio geothermal system is permeable and connects to Pyramid Lake. In addition, the water table in San Emidio is at a higher elevation than the surface elevation of Pyramid Lake (NDWR well file records) and you would have to assume that the faulting that connects the two basins is not permeable; and this is contradictory to the data, since the hottest portion of the San Emidio geothermal system is along the Sweetwater fault. Therefore the Sweetwater fault must have good permeability which is good evidence that the San Emidio basin could be connected to the Pyramid Lake basin.

On Page 3-7 of the Hydrogeologic Evaluation, it states that "The TDS, salinity, and pH levels at Pyramid Lake indicate it is hydrologically distinct from surface and groundwater resources north of the Pyramid Lake basin, including the San Emidio Desert" but does not present the data to support this. And how do you compare ground water to surface water, especially when Pyramid Lake is sourced primarily from the Truckee river. In 1988, one year after the San Emidio power plant went on production, the water table was at an elevation of about 4044 feet above sea level, 6 feet below ground level (AMOR II, 1988). By 1994 it had dropped to an elevation of 3923 feet above sea level, 142 feet below ground level (Pruett 1994). The elevation of pyramid lake is 3792 feet above sea level and therefore, there is probably a significant amount of recharge of fresh water from San Emidio into Pyramid lake along permeable fault zones and or through permeable geologic units (volcaniclastic rocks), as described in the Hydraulic Evaluation on page 4-10.

10) The Hydrogeologic Evaluation failed to accurately characterize the geothermal system.

The report emphasizes that the geothermal system is fault controlled but then states that "These north-northeast striking structures appear to be geologically independent of the Lake Range, Fox Range, and Pyramid Lake faults, which appear south of the Project area". There are no temperature gradient or isotherm maps in the hydrogeologic evaluation that support this conclusion. Folsom (2020, Figure 1) presents an isotherm map at 30m below ground level; however, as Warren(2018) points out, the San Emidio geothermal resource is hotter to the south (towards the PLPT reservation) and the anomaly is open-ended to the south. In Figure 1 of the attached map Ehni outlines the areal extent of the hypothetical "Sweetwater geothermal system". The proposed North Valley Geothermal Development project is on the northeast end of the Sweetwater geothermal system. The right stepping right lateral Lake Range fault on the shores of the Pyramid Lake, and the Northern Extension of the Lake Range Fault adjacent to the existing San Emidio project, are connected by the dilational Sweetwater and Hell's Kitchen faults. The hydrogeologic evaluation completely misses this correlation. The San Emidio geothermal resource is located on the north end of the dilational Sweetwater extensional (NW-SE tension) fault zone which connects the northern extension of the Lake Range Fault in the San Emidio

basin with the Lake Range fault in the Pyramid Lake basin. As pointed out by Warren (2018), the San Emido geothermal anomaly extends to the south, which is where the Sweetwater fault is located. The hydrogeologic evaluation failed to show the relationship of the hottest portion of the San Emidio geothermal system and the Sweetwater fault. On Page 2-2 the Hydrogeologic Evaluation states that "The San Emidio and Empire faults are in and most closely associated with the Project" and as depicted on the Figure 3 of the Hydrogeologic Evaluation, the Empire fault is actually the northern extension of the Sweetwater fault (Faulds et al 2013, Anderson and Faulds 2013, Crafford 2007). It should be noted that The Faulting on Figure 3 of the Hydrogeologic Evaluation is not consistent with other published maps (Faulds et al 2013, Anderson and Faulds 2013, Crafford 2007). The Lake Range Fault on Figure 3 splits at Hells Kitchen and on figure 3 the Hells Kitchen fault is called the Lake Range fault. If this is correct, then the Lake Range fault that appears to supply the hot water for the Pyramid Hot Springs is the same fault that San Emidio is on. On Page 4-6 of the Hydrogeologic Evaluation states that "The Lake Range fault extends from the southeastern shore of Pyramid Lake, branches off into an east-northeast-striking oblique fault, and terminates southeast of Wind Mountain Mine" which basically says that the Lake Range fault connects Pyramid Lake with San Emidio. However, it is most likely that the Lake Range Fault and the Northern Extension of the Lake Range Fault are components of a "right stepping, right lateral" fault system and the Sweetwater-Hell's Kitchen faults are dilational or transitional pull apart geothermal zones as noted on figure 6 of the Hydrogeologic Evaluation. The fact that there are no maps of the fault system in the EA, and that the fault system is poorly described with conflicting statements, supports the recommendation that the proposed development, if approved, will need a robust monitoring program, directed by the PLPT, in order to protect the resources of the PLPT.

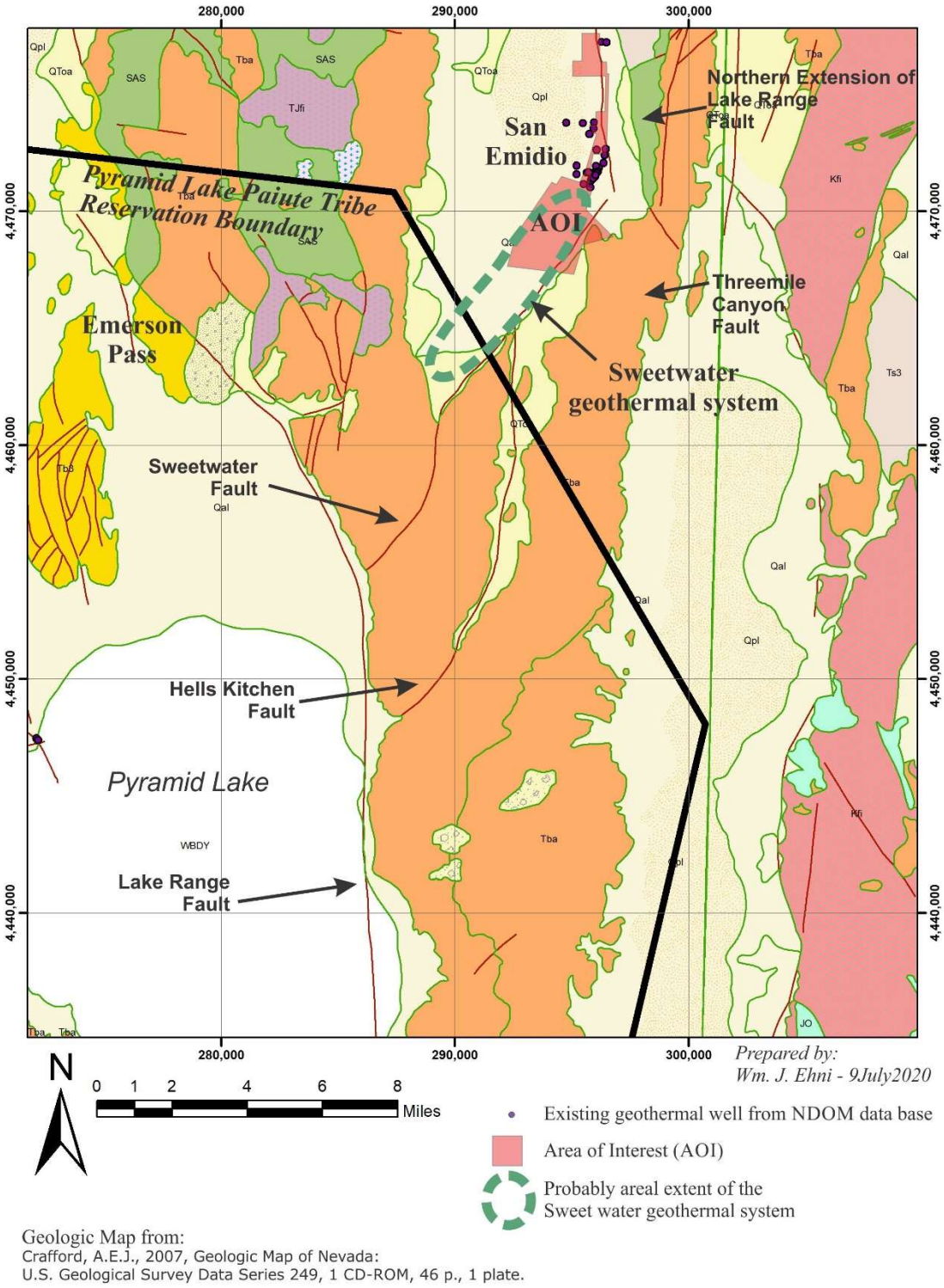


Figure 1: Fault system showing expansion of San Emido geothermal project Area of Interest (AOI) along the Sweetwater fault connecting the Northern Extension of the Lake Range Fault with the Lake Range fault on Pyramid Lake. The AOI appears to be "chopped" off on the southwest end even though supporting documents for the EA and Hydrogeologic report indicated that the geothermal anomaly is open-ended to the southwest as indicated on this map. (note: some fault names used on this map are colloquial and used as reference only)

11) The Hydrogeologic Evaluation failed to address water chemistry adequately.

The Hydrogeologic Evaluation states that "Geochemistry data from wells in the Project area also indicate the San Emidio geothermal system is hydrologically distinct from geothermal systems at Pyramid Lake and the Smoke Creek Desert." However data supporting this conclusion has been blanked out (Table 4) or just summarily summarized.
How was this decided. In the big picture, the San Emidio fluids are very similar to most Basin and Range fault controlled systems which are characterized by relatively low TDS and low SO4/Cl ratios.

On page 3-3 the Hydrogeologic Evaluation states "*These concentrations* (at San Emido) *are higher than those measured at geothermal systems near Pyramid Lake*" but does not present data that supports this conclusion. However, available data on water analyses from the geothermal fluid at the Needles well on the shores of Pyramid Lake and at San Emidio are relatively similar.

Source	Sample Name	Sample Date		pH @ 21 C	SiO2	HCO3	Cl	SO4	Na	K	Ca
					mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Mesquite	Sam Emidio 75B-16	1994		6.18	132.4	73	2108	189	1199.3	108	139.8
GDA	Needles Geothermal well	1988		8.4	96.5	21.9	1895	324	1075	30	239

Page 3-3 of the Hydrogeologic Evaluation states that "The highest recorded TDS concentration at any Ormat well in the San Emidio Desert is 4,400 mg/L (ORMAT Nevada, Inc. 2020b; see **Table 4**), whereas TDS concentrations in Pyramid Lake typically exceed 5,500 mg/L (see **Section 3.3.3**)." Comparing geothermal water with lake water that is derived primarily from the Truckee River drainage system is meaningless, and there is no section 3.3.3 in this report. The Hydrogeologic Evaluation falsely states on Page 3-7 that "There are no known groundwater inflows to Pyramid Lake from outside the basin."
The data should be summarized in Piper Diagrams in order to make the conclusions that the Hydrogeologic Evaluation has arrived at, but there is no mention of this type of analysis, and therefore is deficient.

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Washoe-Storey Conservation District

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July 27, 2020

Washoe County Community Services Department

C/O Dan Cahalane, Planner

1001 E Ninth Street, Bldg. A

Reno, NV 89512

R: WSUP20-0013 Ormat Geothermal

Dear Dan,

In reviewing the special use permit for Ormat Geothermal, the Conservation District has the following comments.

We will require a coated sudan brown galvanized fencing for the chain link including the entry gates.

We support the applicant in dark sky lighting to minimize off site glare.

All buildings (including roofs), pipelines, well heads as well as the utility infrastructure use colors to blend into the landscape.

The 60 acres will be reseeded using a seed mix selected by Bureau of Land management (BLM). The Conservation District requests a copy of this revegetated plan. In addition, we request the BLM, require the applicant to demonstrate a management plan for the prevention of noxious as well as other weeds from seeding in the disturbed areas.

To prevent the spread of noxious weeds concerning grading and exportation of material, we request the BLM require the applicant to develop an onsite noxious weeds management plan to ensure weed seeds do not impact other areas.

The use of existing roads and construction of over 4 miles of new roads have a 15 to 20-mile speed limit stated in their maintenance manual to minimize dust issues while accessing the roads to the facility.

Thank you for providing us the opportunity to review the project that may have impacts on our natural resources.

Sincerely,

Tyler-Shaffer

TMRPA
TRUCKEE MEADOWS REGIONAL PLANNING AGENCY

INITIAL REVIEW MEMORANDUM

TO: Dan Cahalane, Washoe County

FROM: Chris Tolley, TMRPA

DATE: July 2, 2020

SUBJECT: TMRPA initial review of Washoe County case WSUP20-0013 (Ormat Geothermal)

This memorandum provides the Truckee Meadows Regional Planning Agency's (TMRPA) initial review comments regarding the subject case (WSUP20-0013), as stated in the 2019 Truckee Meadows Regional Plan (Policy RC 5).

The following constitutes an initial review based on the limited submittal information provided through the June 2020 Application Review Memorandum I. TMRPA recognizes that the proposal may change through the jurisdictional review of the case.

Based on TMRPA's understanding of the application, should the case be approved through Washoe County, the proposal will need to be formally submitted to TMRPA for an amendment to *Map 3 – Regional Utility Corridors & Sites* and a review of conformance with the 2019 Truckee Meadows Regional Plan in its entirety.

The request, as described in the materials provided by Washoe County, is the following:

> **The establishment of an energy production, renewable use type for two 24mW geothermal power plants**, major grading for 189.9 acres of ground disturbance, 200,000cy of excavation, and a request to vary landscaping standards. **[The request is considered a project of regional significance for proposing an electric substation, transmission line that carries 60 kilovolts or more, and for being a facility that generates electricity greater than 5 megawatts]**. The site is located approximately 10 miles north of Pyramid Lake, and the transmission line is located from approximately 10 miles east of the southern tip of Pyramid Lake south to the border of Washoe County.
>
> [TMRPA notes: **bolded text** identify the portion of the request that is subject to review under the Regional Plan]

Potential conformance issues

TMRPA has not presently identified any potential conformance issues.

WSUP20-0013
EXHIBIT N

The proposal is subject to the Regional Plan policies for regional utility corridors and sites (listed below). Additionally, the proposal of two 24mW geothermal power plants, including an electric substation(s), transmission line(s) that carries 60 kilovolts or more, and for being a facility that generates electricity greater than 5 megawatts is considered a project of regional significance. The guidelines for the definition of a project of regional significance (also known as RPC Resolution 13-06) are located in Appendix 2 of the 2019 Truckee Meadows Regional (pages 146 – 149).

Relative Regional Plan policies

PF 11 – Regional Utility Corridor and Sites Regional Plan Amendment Requirements

RC 6 – Project of Regional Significance (PRS)

Data and information related to Regional Plan implementation

Regional Land Designation: Rural Area (RA)

Development Constraint Areas (DCA): Slopes 30% and up, and public and restricted lands

Regional Utility Corridors: not currently located on the subject site, but proposed in the subject case

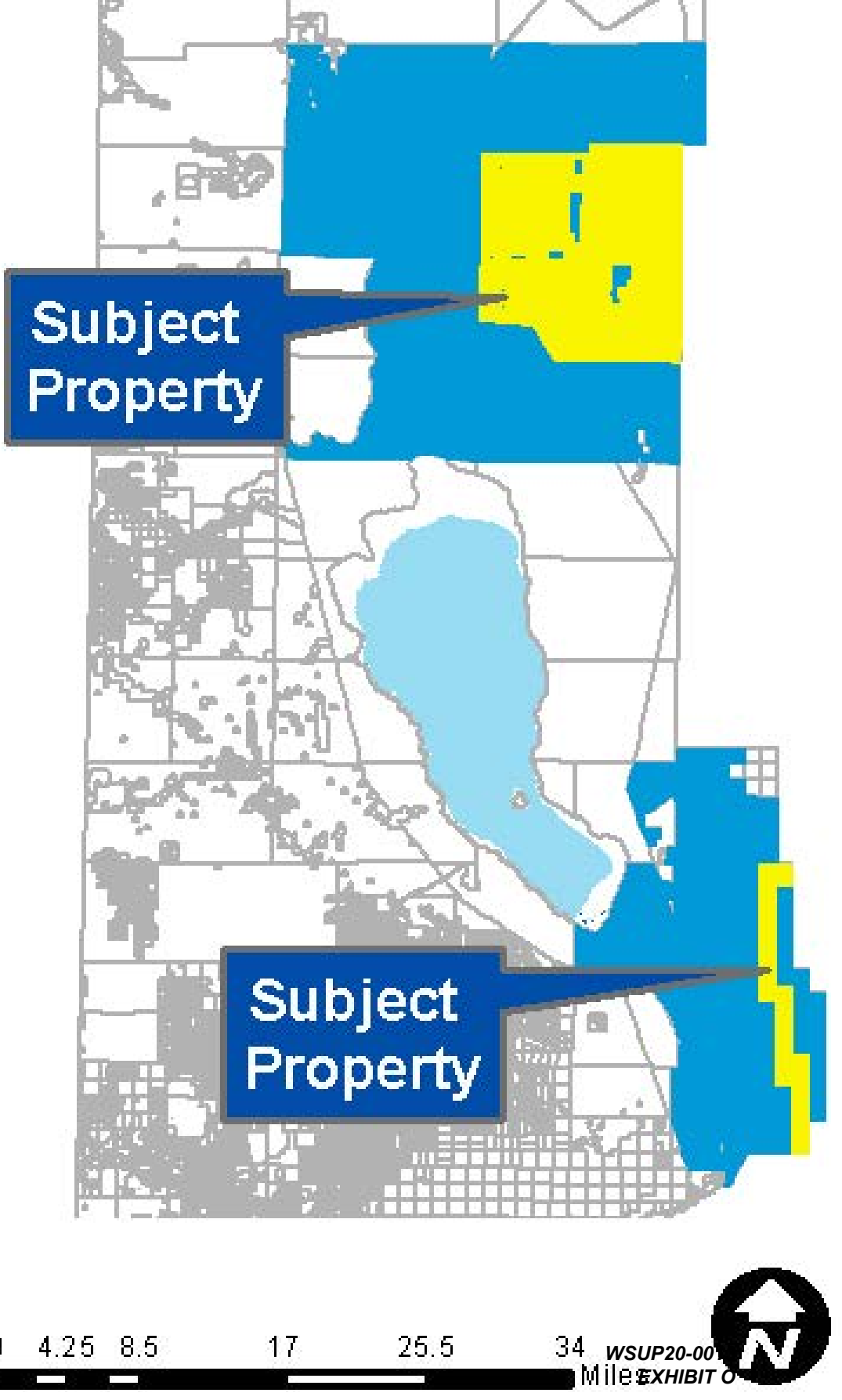
Request for comment from other local government and/or affected entities

None at this time

Other information for review

None at this time

Please do not hesitate to contact TMRPA staff at 775-321-8385 if you have any questions or comments on this initial review memorandum. For more information, you can access the 2019 Truckee Meadows Regional Plan and the Regional Data Viewer at www.tmrpa.org.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Subject Property
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Miles
WSUP20-00
EXHIBIT O

Special Use Permit Application

North Valley Geothermal Development Project

Submitted to Washoe County

June 15, 2020

Prepared for

ORNI 36, LLC

6140 Plumas Street

Reno, NV 89519

Prepared by

WOOD RODGERS

BUILDING RELATIONSHIPS ONE PROJECT AT A TIME

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WSUP20-0018

EXHIBIT P

Table of Contents

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Building staff at 775.328.6100.

Project Information	**Staff Assigned Case No.:**
Project Name:	ORNI 36, LLC North Valley Geothermal Development Project
Project Description:	Construction of two 24 mega watt (mW) geothermal power plants with 21.6 miles of transmission line approximately 14.1 miles south of Empire, NV.
Project Address:	The project is located in two portions of Washoe County. The power plant is 14.1 miles south of Empire
Project Area (acres or square feet):	The geothermal plant will incorporate 189.9 acres with 21.6 miles of transmission line
Project Location (with point of reference to major cross streets **AND** area locator):	The geothermal plant is located approximately 6.2 miles southwest of the intersection of Highway 447 and Rodeo Creek Rd.

Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
See the attached list of APN's			

Indicate any previous Washoe County approvals associated with this application:
Case No.(s). N/A

Applicant Information (attach additional sheets if necessary)

Property Owner:		**Professional Consultant:**	
Name: Multiple (See attached owners list)		Name: Wood Rodgers, Inc.	
Address:		Address: 1361 Corporate Blvd	
	Zip:		Zip: 89502
Phone:	Fax:	Phone: 775.823.4068	Fax: 823.4066
Email:		Email: adurling@woodrodgers.com	
Cell:	Other:	Cell:	Other:
Contact Person:		Contact Person: Andy Durling	
Applicant/Developer:		**Other Persons to be Contacted:**	
Name: ORNI 36, LLC		Name: N/A	
Address: 6140 Plumas Street		Address:	
Reno, NV	Zip: 89519		Zip:
Phone: 356-9029 xt 32288	Fax:	Phone:	Fax:
Email: mwendt@ormat.com		Email:	
Cell: 775-399-0906	Other:	Cell:	Other:
Contact Person: Melissa Wendt		Contact Person:	

For Office Use Only

Date Received:	Initial:	Planning Area:
County Commission District:		Master Plan Designation(s):
CAB(s):		Regulatory Zoning(s):

Special Use Permit Application
Supplemental Information

(All required information may be separately attached)

1. What is the project being requested?

The Project includes the construction and operation of up to two energy generation facilities, 25 geothermal fluid production and injection wells and well pads, access roads, 7.6 miles of geothermal fluid pipelines, 21.6 miles of electrical transmission line and ancillary support facilities.

2. Provide a site plan with all existing and proposed structures (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.)

See the attached site plans.

3. What is the intended phasing schedule for the construction and completion of the project?

Drilling will occur as soon as possible. Construction of the two generation facilities will occur in two phases. Construction would begin upon acquisition of all required permits and would take approx. 9 months to complete the first power plant. Due to the nature of the project, the construction schedule is anticipated to take 3 years to complete.

4. What physical characteristics of your location and/or premises are especially suited to deal with the impacts and the intensity of your proposed use?

This is a new facility in an area with an existing and operating geothermal plant, San Emidio, which is owned and operated by USG Nevada LLC (Ormat), located within the San Emidio Geothermal Unit, which comprises both public and privately leased lands. The project includes several federal geothermal leases. The transmission line will be completely contained within an existing energy corridor.

5. What are the anticipated beneficial aspects or affects your project will have on adjacent properties and the community?

Once completed the project will help the State of Nevada meet its clean energy goals of providing 50% renewable Energy by 2030 and will provide the region with more efficient energy production.

6. What are the anticipated negative impacts or affect your project will have on adjacent properties? How will you mitigate these impacts?

The proposed facility is surrounded by federal land in an area already identified for the lease of geothermal energy production. The applicant is undergoing an Environmental Review that will be reviewed and approved by the BLM to insure the project is not detrimental to the area. Very little negative impacts to the surrounding communities is anticipated.

7. Provide specific information on landscaping, parking, type of signs and lighting, and all other code requirements pertinent to the type of use being purposed. Show and indicate these requirements on submitted drawings with the application.

Of the disturbed land, 60.9 acres will be re-seeded with a native shrub mix to blend with the natural setting of the surrounding area. Where proposed, lighting will follow dark sky standards to minimize impacts to the surrounding neighbors. Buildings and utilities proposed will be painted in colors that will help them to blend into the landscape. See project description for further detail.

8. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that apply to the area subject to the special use permit request? (If so, please attach a copy.)

❑ Yes	■ No

9. Utilities:

a. Sewer Service	Septic System
b. Electrical Service	Ormat
c. Telephone Service	At&T
d. LPG or Natural Gas Service	N/A
e. Solid Waste Disposal Service	N/A
f. Cable Television Service	N/A
g. Water Service	Private wells

For most uses, Washoe County Code, Chapter 110, Article 422, Water and Sewer Resource Requirements, requires the dedication of water rights to Washoe County. Please indicate the type and quantity of water rights you have available should dedication be required.

h. Permit #	79899, 79900, 66946, & 69320	acre-feet per year	
i. Certificate #	21223, 21224, 21221, & N/A	acre-feet per year	104.8, 470.4, 5, & 361.985
j. Surface Claim #		acre-feet per year	
k. Other #		acre-feet per year	

Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources).

10. Community Services (provided and nearest facility):

a. Fire Station	Washoe County Fire Station 242; 8.5 miles north
b. Health Care Facility	Banner Health Center; 78 miles south (Fernley)
c. Elementary School	N/A
d. Middle School	N/A
e. High School	N/A
f. Parks	N/A
g. Library	N/A
h. Citifare Bus Stop	N/A

Special Use Permit Application
for Grading
Supplemental Information

(All required information may be separately attached)

1. What is the purpose of the grading?

   A majority of the grading is associated with the pads for the 25 proposed wells, the pad for the two power generation facilities, the new and improved roads to access the wells, and for the pipeline. An existing borrow pit adjacent to the San Emidio plant, will be the source of cover for the roads and pads.

2. How many cubic yards of material are you proposing to excavate on site?

   300,000 cubic yards

3. How many square feet of surface of the property are you disturbing?

   194.9 Acres

4. How many cubic yards of material are you exporting or importing? If none, how are you managing to balance the work on-site?

   An existing borrow pit within the site will be expanded by up to 5 acres to provide materials for the cover for the roads and pads.

5. Is it possible to develop your property without surpassing the grading thresholds requiring a Special Use Permit? (Explain fully your answer.)

   No, the project is too large of scale to not trigger the SUP.

6. Has any portion of the grading shown on the plan been done previously? (If yes, explain the circumstances, the year the work was done, and who completed the work.)

   Yes, there are roads and borrow pit from a previous geothermal project that will be incorporated into this project to reduce the required amount of grading. Furthermore, a majority of the project will utilize existing roads.

7. Have you shown all areas on your site plan that are proposed to be disturbed by grading? (If no, explain your answer.)

   No, minor disturbance will be required for each of the new power poles that will support the transmission line. These are within an existing energy corridor with an existing access road that will help to minimize the disturbance. Very minor grading activities are anticipated.

8. Can the disturbed area be seen from off-site? If yes, from which directions and which properties or roadways?

Yes, however, this is an extremely rural location surrounded by federal land. Visual impacts will be minimal as a majority of the project is utility infrastructure and will be painted using tones and colors that will help to blend with the surrounding area.

9. Could neighboring properties also be served by the proposed access/grading requested (i.e. if you are creating a driveway, would it be used for access to additional neighboring properties)?

The roads are only intended to service the wells, pipeline, power generation facility, and transmission lines. They are not intended to serve any other properties. Roads leading into the power generation facility will be fenced and gated.

10. What is the slope (horizontal/vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

Areas that are temporarily disturbed will be revegetated where possible. The pads and roads will be covered with gravel and maintained throughout their life to help prevent erosion

11. Are you planning any berms?

Yes	No X	If yes, how tall is the berm at its highest?

12. If your property slopes and you are leveling a pad for a building, are retaining walls going to be required? If so, how high will the walls be and what is their construction (i.e. rockery, concrete, timber, manufactured block)?

No retaining walls will be required.

13. What are you proposing for visual mitigation of the work?

Refer to Project Description in Section 2 for specific information.

14. Will the grading proposed require removal of any trees? If so, what species, how many and of what size?

No trees have been identified on site.

15. What type of revegetation seed mix are you planning to use and how many pounds per acre do you intend to broadcast? Will you use mulch and, if so, what type?

The type seed mix and the method used will be chosen by the BLM to be within compliance of their policies for successful revegetation.

16. How are you providing temporary irrigation to the disturbed area?

Water used for dust control would be obtained under an existing water right at a hydrant in the existing geothermal facility.

17. Have you reviewed the revegetation plan with the Washoe Storey Conservation District? If yes, have you incorporated their suggestions?

The project is being reviewed by the BLM and their requirements for revegetation will be met.

18. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that may prohibit the requested grading?

Yes	No X	If yes, please attach a copy.

List of Owners and Parcel APN's

APN	OWNER/LASTNAME	Proposed Improvements
079-170-02	CERESOLA BROTHERS LLC	Transmission Line
079-180-02	CERESOLA BROTHERS LLC	Transmission Line
079-180-12	CERESOLA BROTHERS LLC	Transmission Line
079-180-45	CERESOLA BROTHERS LLC	Transmission Line
079-570-01	CERESOLA BROTHERS LLC	Transmission Line
079-570-07	CERESOLA BROTHERS LLC	Transmission Line
079-570-13	CERESOLA BROTHERS LLC	Transmission Line
079-320-12	GM GABRYCH FAMILY LTD PTSP	Transmission Line
079-320-18	GM GABRYCH FAMILY LTD PTSP	Transmission Line
071-070-13	KOSMOS COMPANY	Power Generation Facility
071-070-09	KOSMOS COMPANY	Wells, Well Pads & Pipeline
071-070-12	KOSMOS COMPANY	Wells, Well Pads & Pipeline
071-070-16	KOSMOS COMPANY	Wells, Well Pads & Pipeline
071-070-18	KOSMOS COMPANY	Wells, Well Pads & Pipeline
079-320-04	NEW NEVADA LANDS LLC	Transmission Line
071-030-06	UNITED STATES OF AMERICA	Power Generation Facility
071-060-18	UNITED STATES OF AMERICA	Wells, Well Pads & Pipeline
071-030-07	UNITED STATES OF AMERICA	Wells, Well Pads & Pipeline
079-170-39	UNITED STATES OF AMERICA	Transmission Line
079-180-34	UNITED STATES OF AMERICA	Transmission Line
079-180-37	UNITED STATES OF AMERICA	Transmission Line
079-180-44	UNITED STATES OF AMERICA	Transmission Line
079-320-42	UNITED STATES OF AMERICA	Transmission Line
079-320-47	UNITED STATES OF AMERICA	Transmission Line
079-320-52	UNITED STATES OF AMERICA	Transmission Line
079-320-55	UNITED STATES OF AMERICA	Transmission Line
079-570-02	UNITED STATES OF AMERICA	Transmission Line
079-570-06	UNITED STATES OF AMERICA	Transmission Line
079-570-12	UNITED STATES OF AMERICA	Transmission Line
071-070-19	US GEOTHERMAL INC	Wells, Well Pads & Pipeline

PROJECT DESCRIPTION

Executive Summary

Commission District #:	5, Jeanne Herman
Applicant:	ORNI 36, Inc.
APN Numbers:	**Energy Generation Facility:** 071-070-13 &071-030-06.
	Wells and Well Pads/Pipeline: 071-030-07, 071-060-18, 071-070-09, 071-070-12, 071-070-16, 071-070-18, 071-070-19, & 079-170-02.
	Transmission line: 079-170-39, 079-180-02, 079-180-12, 079-180-34, 079-180-37, 079-180-44, 079-180-45, 079-320-04, 079-320-12, 079-320-18, 079-320-42, 079-320-47, 079-320-52, 079-320-55, 079-570-01, 079-570-02, 079-570-06, 079-570-07, 079-570-12, & 079-570-13.
Request:	A request has been made for special use permits to: 1) allow for the "Renewable Energy Production" and the "Development of Natural Resources" per Articles 302/810 2) allow for "Major Grading" per Article 438 3) allow for a Project of Regional Significance per Article 812 4) allow for the use of "Hazardous Material" per NRS 459.3816 and Article 810
Location:	The 189.9± acre site is located approximately 6.2-miles southwest of State Highway 447 and Rodeo Creek Road in the High Desert and Truckee Canyon Planning Areas.

Background

The project is located in an area that has natural resources that have historically been used in the production of renewable energy and is identified as the San Emidio Desert Hot Springs, a geothermal unit specified within the Washoe County High Desert Area Plan. The unit covers federal geothermal leases and is comprised of both public and privately leased lands. The proposed transmission line will be constructed within an already existing Department of Homeland Security/Bureau of Land Management (BLM) energy corridor and existing easement. The transmission line will span across Washoe, Pershing, Churchill, and Lyon County.

The applicant has submitted a Plan of Development and right-of-way application to the BLM. In addition, an Environmental Assessment is being prepared to analyze the environmental impacts of the Project by the BLM, and is expected to be completed by the end of July 2020. A copy of the draft EA is available here: https://eplanning.blm.gov/public_projects/1503204/200352910/20019390/250025594/North%20Valley%20Geothermal%20Public%20Draft%20EA_508.pdf

Washoe County Master Plan and Zoning

The project will include 30 parcels within Washoe County with a project footprint of 189.9 acres of land (project area). The project area is broken into two portions; a northern portion which will be the location of the power generation plants, supporting facilities, and well fields, and the southern portion which will only contain the transmission line. The entire project area has a master plan designation of Rural (R) and a zoning designation of General Rural (GR) and is located within the High Desert and Truckee Canyon Area Plans, *(Refer to Vicinity Map, Site Aerial, Existing Master Plan Map, and Existing Zoning Map in Section 3 of this submittal packet).*

Site Characteristics

The proposed project impact area totals 2,414 acres of which only approximately 189.9 acres are expected to be disturbed. A majority of the development will occur in the northern portion where the overall North Valley Geothermal Power Plant complex is proposed. Due to the location, this area is an extremely rural and predominately utilized by the production of renewable energy. Although there is some topography the slopes are relatively gentle with no slopes greater than 30%. The main access to the site will utilize the existing access route off of State Highway 447. The route uses Rodeo Creek Road, approximately 8.5 miles south of Empire, NV, which accesses the project area from the north. The project is expected to utilize the existing maintenance roads where possible.

The southern portion, as identified in the Vicinity Map in Section 3, will only include the transmission line, will utilize the existing maintenance road that runs parallel to the proposed transmission line, generally running north to south. Ground cover contains bare earth, mixed with vegetation including sagebrush, grasses and weeds.

Project Request

Included with this application are special use permits to allow for (1) the renewable energy production and the development of natural resources associated with a new geothermal power generating facility, (2) major grading, (3) a Project of Regional Significance, and (4) the use of hazardous materials. The project will include a two geothermal energy production plants, well fields and pipelines, and 21.6 miles of transmission line that will span a project area of approximately 189.9 acres, (*see the Parcel List included in Section 3 of this submittal packet*).

Project Description:

The applicant is proposing two, 24-megawatt (MW) binary design geothermal energy generation facilities, substation, geothermal fluid production and injection wells and well pads, access roads, geothermal fluid pipelines, an electrical overhead transmission line, and ancillary support facilities.

Specifically, geothermal energy will be produced using a binary cycle power plant design. The hot brine (geothermal fluid) is pumped up through production wells and fed into a heat exchanger. The heat from the water is absorbed by pentane, a secondary motive fluid, which is a flammable but non-toxic hydrocarbon that circulates in a closed loop. The pentane vapor is used to drive the turbine, producing electricity. The pentane is then condensed back to its liquid state using air-cooled condensers that range between 28 – 35 feet in height. The condensed motive fluid would then be pumped back to the heat exchangers for reheating and vaporization, and the geothermal fluid is injected back into the geothermal reservoir, completing the closed cycle.

The whole process is in a closed loop system in which the pentane and the geothermal brine never come into contact with each other. The geothermal fluid, after travelling through the heat exchangers, would be pumped under pressure to the injection wells through the injection pipelines and back into the geothermal reservoir, minimizing the loss of water. There will be no emissions of pentane to the atmosphere during normal plant operations.

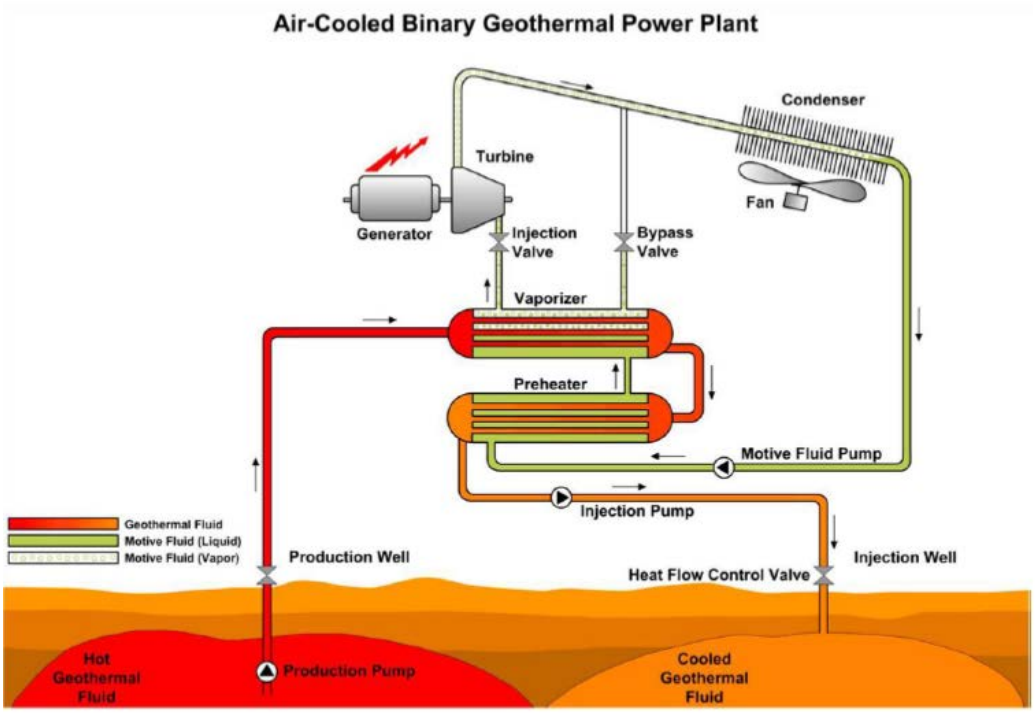

Figure 1 - Binary Plant Operations

In addition to the power plant, an approximately one half-acre substation used to transform low voltage energy to the higher voltage needed for the transmission line, will be constructed within the northern energy plant boundary (*refer to site plan in Section 4*).

The rest of the plant is an array of pipes and a small building to house electrical equipment. The perimeter of the site will be fenced with an 8-foot chain-link fence topped with barbed wire to prevent unwarranted access to the facility by the public and the entering of wildlife into the facility/electrical generation area. The chain link fence is equipped with controlled-entry gates to allow vehicle egress/ingress as necessary.

Ancillary facilities and energy plant components that will be constructed on the energy plant sites include offices, restrooms, the electrical room and control room, maintenance building, condensing fan equipment, electrical substation and other smaller ancillary structures. All buildings housing the offices, electrical room, control room and auxiliary buildings will be a rigid, steel-frame, pre-engineered structure with steel panel walls and a steel roof. The exterior of the buildings will be painted using colors consistent to blend in with surrounding areas, as stated within the High Desert Area Plan and as approved by BLM.

The project also includes two 500-gallon diesel fuel and one 500-gallon unleaded gas, aboveground storage tanks within each power plant footprint. The diesel tanks are used to backup generators and the gasoline tanks are used for fueling equipment. These tanks will be double-walled construction and placed in concrete secondary containment basins. As required and authorized by BLM, the Applicant will prepare a spill prevention, control and countermeasure plan for on-site storage of diesel and gasoline.

Figure 2 - Typical Geothermal Facility (Note: top of air coolers 40' above grade)

In addition to the two power plants, the applicant is proposing up to 25 production and injection wells, all located on public lands managed by the BLM. A system of geothermal fluid production and injection pipelines will be constructed from the wells to the plant. The pipelines will bring the geothermal fluid from the production wells to the energy plant and deliver the cooled geothermal fluid from the energy plant to the injection wells, respectively. Approximately 7.6 miles of production and injection pipeline are proposed. Depending on the well(s) being served, pipelines will be between 8 and 30 inches in diameter. The production and injection pipeline routes generally follow the shortest distance from each well pad to the next well pad or the production plant in order to maximize efficiency and to minimize the amount of ground disturbance. In addition, the proposed pipeline routes generally follow existing or proposed roads to facilitate ongoing monitoring and future maintenance. The pipelines and wellheads will be painted using colors consistent to blend in with surrounding areas, as stated within the High Desert Area Plan and as approved by BLM.

The proposed geothermal plants will connect the electrical substations to the electrical grid via a 61-mile transmission line within the 368 energy corridor and will span four County's. Specifically, 21.6 miles of the transmission line is located within Washoe County generally running north to south within an existing easement and will utilize an existing maintenance road. The line runs from the plants southeast into Pershing County, from Pershing County the line then enters Churchill County and from here, it re-enters Washoe County from Churchill County approximately 33.2 miles to the south of the proposed plants where it continues to run in the north south direction until it enters Lyon County (*see Aerial Map and Vicinity Maps in Section 3 of this submittal packet)*.

In terms of water use, approximately 50,000 gallons per day will be used during the first 2 months of construction for compaction and dust control and 5,000 gallons per day will be used for dust control thereafter for approximately 6 months. This water will be supplied from geothermal fluid, the Sweetwater Well that

provides cooling water to the existing geothermal plant, a private ranch source, or one or more shallow water wells drilled from one or more of the proposed drill sites.

Once operating, the facility will use up to approximately 325 gallons per day, or 0.37 acre-feet per year. This water is anticipated to be obtained from the Sweetwater Well via existing pipeline from the well to the project site. It is worth noting that in an effort to reduce usage from the Sweetwater Well, the Applicant will provide drinking water from a commercial water source for the employees. Additionally, it is not feasible to drill a local well for domestic use because the shallow aquifer near the project area is very hot and would require significant effort to treat to drinking water quality.

In terms of employees, during construction we anticipate up to 50 workers, with an average of 3-4 workers after grading and excavation. Once operating, the Project will have approximately 15 – 20 total employees with 1-2 employees onsite at any given time. Additional facility/complex support staff would continue to work out of the existing San Emidio control room and administrative offices.

Construction of the new power plant is anticipated to start in the 4th quarter of 2020, with commercial operation being planned for August 2021.

Major Grading Special Use Permit

A special use permit is required to address grading since the estimated disturbed land is estimated at approximately 189.9 acres, exceeding the thresholds outlined in Article 438.35 of the Washoe County Development Code. Cuts and Fills will be minimized to reduce visual impacts from the surrounding areas and to utilize and mimic the natural topography of the land, as described within the High Desert Area Plan.

Grading activities include clearing of the ground for new roads, well pads, plant pads, pipelines, improvements to the existing road, and the placement of power poles for the transmission line. Subsequently, cutting of slopes would be required where necessary. Total project disturbance, prior to interim reclamation, will be approximately 189.9 acres. Total project disturbance after interim reclamation will be approximately 129 acres.

As much as possible, native materials (derived from grading to balance cut and fill) will be used for site and road building materials. Approximately 100,000 cubic yards of surfacing material may be needed for energy plant and pipeline construction. Material will be obtained from an existing pit previously used for the San Emidio Geothermal Facility (located on APN 071-070-09), which is within the project area. This existing pit is anticipated to be expanded by up to five acres *(refer to Plan Sheet G2).*

A majority of the disturbance will be for the power generation facility pads and for the injection wells. Temporary surface disturbance for the 25 proposed well pads would be 4.2 acres per pad, or 105 acres in total. After interim reclamation, there would be 2.5 acres of permanent disturbance at each well pad, or 62.5 acres in total.

Drill pad preparation activities would include clearing, earthwork, drainage and other improvements necessary for efficient and safe operation and for fire prevention. Only those drill pads scheduled to be drilled would be cleared. Clearing would include removal of organic material, stumps, brush and slash, which would be either be removed and taken to an appropriate dump site, or left onsite. Topsoil would be stripped (typically to the rooting depth) and salvaged during the construction of all pads, as feasible. Salvaged topsoil would be stockpiled on the pads for use during subsequent reclamation of the disturbed areas.

Each drill pad would be prepared to create a level pad for the drill rig and a graded surface for the support equipment. Storm water runoff from undisturbed areas around the constructed drill pads would be directed into ditches surrounding the drill pad and back onto undisturbed ground, consistent with best management practices for storm water. The site would be graded to prevent the movement of storm water from the pad off of the constructed site, and has been designed for a 100-year storm.

In addition to grading for the plant facilities and well pads, disturbance associated with the pipelines is anticipated to occur during construction. Temporary surface disturbance associated with the pipelines will be approximately 36.8 acres (40,055 ft. x 40 ft. width of disturbance). After interim reclamation is performed, the permanent disturbance would be approximately 18.4 acres (20 ft. disturbance width).

Other major grading activities include new roads and/or improvements to existing roads providing access to the well pads. The total estimated area of surface disturbance required for new access road construction, assuming a 25-foot wide area of disturbance will be about 12.8 acres. Due to the presence of existing project facilities in the vicinity, less than one mile of existing access roads may need to be improved (i.e. widened, graded or bladed) to maintain a drivable roadbed to access the project area. The total estimated area of surface disturbance associated with road improvement activities is approximately 0.3 acres.

Hazardous Materials

The proposed project will utilize pentane as the motive fluid. Pentane is used at numerous applicant owned-and operated geothermal power plants across Nevada, and at hundreds of geothermal plants worldwide. Pentane gas (motive fluid) is flammable but non-toxic and, as such, requires advanced permitting through the State and County (including the requested special use permit). As designed, the project site is anticipated to contain up to 720,000 pounds of pentane in the system at any given time. Specifically, each power plant is anticipated to contain up to 360,000 pounds of pentane in the system at any given time. During operation, pentane is pumped from the motive fluid storage tanks into the closed-loop system (*refer to Figure 1 – Binary Plant Operation*). During planned or unplanned facility maintenance, the pentane is pumped back in to and sealed off from the system to allow for safe working conditions and prevent pentane losses. There will be no disposal of pentane as it is used continuously in a completely sealed, closed-loop process. Minor pentane losses that do occur will be due to the escape of this working fluid from rotating seals and flanges on the heat exchangers and during maintenance on the binary power plant units. All of these losses, estimated to average about 12 tons per year, requires increased safety and monitoring protocols.

As pentane is a potentially hazardous material, the Applicant is required to obtain Chemical Accident Prevention Program (CAPP) permits and Class II Operating Permit through the Nevada Division of Environmental Protection (NDEP). The CAPP permits require the Applicant to coordinate with Washoe County Emergency Management and local emergency responders to develop an approved Emergency Action Plan (EAP) for the facility. In addition to the EAP, Standard Operating Procedures for the safe handling of pentane are developed and coordinated with NDEP for each generation facility under the CAPP permits. These protocols are currently being utilized in the other geothermal energy production facilities operated by the Applicant, whom has a stellar safety record to rely on. A copy of the Safety Data Sheet for n-pentane is provided in Section 4 of this application package.

Project Access and Circulation

The main access to the site will utilize the existing Rodeo Creek Road, which connects to State Highway 447, approximately 14.1 miles south of Empire, NV, and provides access to the project area from the north. Due to the other geothermal energy production plant already in the area, existing maintenance roads will be utilized as much as possible to access the proposed new facilities with minor improvements to the roads where necessary.

In total, approximately 4.2 miles of new roads are anticipated to access the wells/well pads and to maintain the pipeline. These are proposed 20-foot-wide roads. The transmission line will utilize the existing maintenance road within the corridor with minimal to no improvements anticipated.

Traffic and Circulation

Minimal traffic is anticipated once operations are complete. A majority of the traffic will occur during construction. During construction, up to 50 workers may be on-site, with an average of 3-4 workers on-site after grading and excavation. Once operating, the facility will have 15-20 employees with the power plant having 1-2 employees onsite at any given time. Once complete, the project is estimated to generate a maximum of 22 weekday peak hour trips, well below the thresholds required to provide a traffic analysis. A majority of the trips will be generated during the construction of the project. However, since the access is utilizing an already existing paved road, and since the area is so remote, any impacts are anticipated to be minimal.

As a part of the project, the Applicant is requesting to eliminate requirements associated with parking and maneuvering areas being paved. The applicant is requesting that this requirement be waived since paved parking is generally intended for the urban environment and the location of the project is very remote and does not include services like storm water utilities including curb and gutter which are generally included with the installation of pavement. A letter requesting this waiver has been included with this application.

Utilities

Following construction, facility water needs will include fire suppression and general maintenance water and is estimated to need approximately 0.37-acre feet per year (approximately 325 gallons per day). This water will be used primarily for septic purposes and obtained from a shallow water well(s) drilled from one or more of the proposed drill sites or other sources as approved by the BLM and noted in the Utilization Plan.

Landscaping

Of the 189.9 acres of disturbed land that is proposed, 129.0 acres will be developed and the other 60.9 acres will be revegetated with a native seed mix. This is proposed in an attempt to support the Character Management Area of the High Desert as outlined in the High Desert Area Plan, specifically Goal 2 which states:

"All landscape designs will emphasize the use of native and low water requirement vegetation, with non-native and atypical vegetation integrated sparingly into any landscaped area."

Following this goal, the proposed landscape will attempt to keep the area looking natural and undisturbed. Efforts in grading when clearing the land including preserving the topsoil, as previously discussed, will help to ensure the success of re-establishing the native vegetation after it has been disturbed by grading processes. No formal landscaping is proposed as it will not reflect the character of the High Desert Planning Area.

As a part of the project, the Applicant is requesting that the requirements associated with landscaping and screening be waived in accordance to help the project meet the Character Statement outlined in the High Desert Area Plan. Several policies, including Policy HD.16.5 encourage the use of native drought tolerant plants to be

used in the landscape. This is consistent with what the Applicant is proposing in accordance with the Bureau of Land Management (BLM) standards. This is proposed along areas where temporary grading has occurred and does not include roads, and maintenance areas around building. Proposing formal landscaping including trees and screening shrubs in accordance with Section 110.412 would have a negative visual impact on the area and take away from the character of the area since the native vegetation does not include plant types typically found in more formal landscaping, including the use of trees.

In terms of fencing, as noted previously, the Applicant is proposing the use of 8-foot tall chain-link fence topped with barbed wire. This fence type will keep the area secure from the public and wildlife as well as have less visual impact on the surrounding properties. A letter requesting this waiver has been included with this application.

Lighting

Except for lighting needed for periodic maintenance activities, exterior perimeter lighting within the North Valley Power Plant site will comply with Dark Skies and will be pointed downwards and shielded to minimize off-site glare in accordance to the High Desert Area Plan. Motion sensors will also be used so that lights are only on as-needed.

Fencing

The only fencing proposed within the project is 8-foot-tall chain-link fence topped with barbed wire. This will mainly be focused around the perimeter of the plant pads to prevent unwarranted access to any facilities by the public and the entering of wildlife. As noted previously, a letter requesting relief on fencing requirements has been included with this application.

Development Statistics

Project Parcels:	30 Parcels
Power Generation Facility APN's:	071-070-13
	071-030-06
Wells and Well Pads/Pipeline APN's:	071-030-07
	071-060-18
	071-070-09
	071-070-12
	071-070-16
	071-070-18
	071-070-19
	079-170-02
Transmission line APN's:	079-170-39
	079-180-02
	079-180-12
	079-180-34
	079-180-37
	079-180-44
	079-180-45
	079-320-04
	079-320-12
	079-320-18
	079-320-42
	079-320-47
	079-320-52
	079-320-55
	079-570-01
	079-570-02
	079-570-06
	079-570-07
	079-570-12
	079-570-13
Potential Project Impact Area:	2,414.0± acres
Project Area:	189.9± acres
Landscape/Re-Vegetation Area:	60.9± acres

Findings

General Special Use Permit Findings

Prior to approving an application for a special use permit, the Planning Commission, Board of Adjustment or a hearing examiner shall find that all of the following are true:

(a) Consistency. The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the applicable area plan;

Response: The entire project area is designated as Rural and in accordance with Washoe County Development Code, renewable energy production is an allowed use through the approval of a special use permit. Furthermore, this specific location is identified within the High Desert Area Plan as the San Emidio Desert Hot Springs, an area identified as a geothermal area, a fact that is supported by the presence of an already existing geothermal power plant within the area. The proposed project has been designed to meet goals and policies within the area plan; specifically, goal fourteen which states that Washoe County will support the development of geothermal energy production.

(b) Improvements. Adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;

Response: The majority of the roads needed for the project are already existing with minor improvements proposed. However, new roads totaling approximately 4.2 miles, are proposed where existing roads cannot serve the new facilities. Minimal utility services are proposed. Following construction, facility water needs will include fire suppression and general maintenance water and is estimated to need approximately 0.37-acre feet per year (approximately 325 gallons per day).

It is worth noting that in an effort to reduce usage from the Sweetwater Well, the Applicant will provide drinking water from a commercial water source for the employees. It is not feasible to drill a local well for domestic use because the shallow aquifer near the project area is very hot and would require significant effort to treat to drinking water quality.

(c) Site Suitability. The site is physically suitable for the type of development and for the intensity of development;

Response: As previously stated, the project site is located in an area previously identified by the County as an area of geothermal activity, therefore suggesting it is physically suitable for this type of development. Furthermore, adjacent properties are already utilizing the geothermal resources using similar methods to the proposed project. As noted previously, the majority of the project (in the northern section) is relatively flat and contains no slopes greater than 30%. The 21.6 miles of transmission line are in an existing energy corridor and will follow an existing power line and maintenance road.

(d) Issuance Not Detrimental. Issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area; and

Response: The approval of the special use permit will help the State of Nevada meet the goals of providing 50% renewable energy production within the state by 2030. Generally, renewable energy is favored over the burning of fossil fuels due to its low impact on the land, air, and water quality. When done properly, as the Applicant has a history of doing so, it is not detrimental to the public health. Often providing a benefit, by serving the surrounding community with clean energy that emits very little greenhouse gases.

(e) Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

Response: N/A

***Development of Natural Resources Special Use Permit Findings*:**
All natural resources development shall require a special use permit reviewed by the Board of Adjustment. Natural resources development includes energy production, mining operations, petroleum gas extraction, and forest products production. In addition to the findings required in other sections of this article, issuance of a special use permit for development of natural resources shall be contingent on the Board of Adjustment making the following findings:

(a) That the proposed development is not unduly detrimental to surrounding properties, land uses and the environment in general;

Response: The proposed project is within an area already being utilized in the production of geothermal energy and is located within an extremely rural portion of the County. The project will utilize a majority of the existing roads and utilize grading standards that minimize cuts and fills and take into account the natural contours of the land. To minimize impacts of the land and to maximize efficiency, the pipelines are arranged to minimize disturbance of the land. The proposed process of geothermal energy production produces minimal emissions and has very little impact on the environment. A draft Environmental Assessment prepared and pending approval by the BLM will ensure mitigation and monitoring programs are met so that the project is not detrimental to the surrounding properties, land uses and the environment.

(b) That the proposed development will not unduly block scenic views or degrade any surrounding scenic resources; and

Response: The grading will be minimal as discussed earlier to minimize the disturbance area and to utilize the natural contours of the project area. Furthermore, the proposed pipelines are located along the ground and will have very little visual impacts. The two plants will be the most visible structures throughout the project area. In an effort to maintain a natural appearance, no landscaping or screening is proposed. However, the well heads, pipelines, buildings, and power plant components will be painted a BLM approved color to blend with the surrounding area and minimize visibility. Where reclamation of disturbed areas is proposed, a native seed mix will help to blend in with the natural setting and will minimize any impacts from the surrounding scenic resources.

(c) That the proposed development will reclaim the site and all affected areas at the conclusion of the operation

Response: The Applicant has a long history of reclamation on several other projects throughout the area. Reclamation of the site will be provided in accordance with all Federal, State, and Local regulations.

Hazardous Materials Special Use Permit Findings:

Prior to recommending approval of the special use permit application, the Planning Commission shall find that:

(1) Consistency. The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the applicable area plan;

Response: The use of pentane, a hazardous material for renewable energy production is allowed through the approval of a special use permit within the Rural master plan. The entire project area is designated as Rural. Furthermore, this specific location is identified within the High Desert Area Plan as the San Emidio Desert Hot Springs, an area identified as a geothermal area. A fact that is supported by the presence of an already existing geothermal power plant within the area. The proposed project will meet a majority of the goals and policies within the area plan; specifically, goal fourteen which states that Washoe County will support the development of geothermal energy production.

Specifically, the pentane gas is flammable but non-toxic and, as such, requires advanced permitting through the State and County (including the requested special use permit). As designed, the project site is anticipated to contain up to 720,000 pounds of pentane in the system at any given time, split between the two power plants. There will be no disposal of pentane as it is used continuously in a completely sealed, closed-loop process, resulting in minimal losses. Losses that do occur will be due to the escape of binary working fluid from rotating seals and flanges on the heat exchangers and during maintenance on the binary power plant units. All of these losses, estimated to average about 12 tons per year requires increased safety and monitoring protocols.

(2) Improvements. Adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven.;

Response: The majority of the roads needed for the project are already existing with minor improvements proposed. However, new roads totaling approximately 4.2 miles, are proposed where existing roads cannot serve the new facilities. Minimal utility services are proposed. Following construction, facility water needs will include fire suppression and general maintenance water and is estimated to need approximately 0.37-acre feet per year (approximately 325 gallons per day). To minimize impacts on the existing shallow aquifer in the area, the Applicant will utilize a septic tank and drinking water will be made available for employees from a commercial bottled water source.

(3) Site Suitability. The site is physically suitable for the type of development and for the intensity of development; and

Response: As previously stated, this is in an area identified by the County as an area of geothermal activity, adjacent properties are already utilizing the geothermal resources utilizing methods much similar to the proposed project. The majority of the project in the northern section is in an area that is relatively flat and contains no slopes greater than 30%. The 21.6 miles of transmission line are in an existing energy corridor and will follow an existing power line and maintenance road. The site is ideally located for the storage of hazardous materials as the remote location makes this an ideal use for this type of development.

(4) Issuance Not Detrimental. Issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area.

Response: The approval of the special use permit will help the State of Nevada meet the goals of providing 50% renewable energy production within the state by 2030. Generally, renewable energy is favored over the burning of fossil fuels due to its low impact on the land, air, and water quality. When done properly, as the Applicant has a history of doing so, it is not detrimental to the public health. Often providing a benefit, by serving the surrounding community with clean energy that emits very little greenhouse gases.

The project is a conforming use and is designed to safely store pentane, a hazardous material that is flammable, but non-toxic. As designed, each power plant is anticipated to have two storage tanks for up to 360,000 lbs. of pentane, per plant, for a total of up to 720,000 lbs. on site. There will be no disposal of pentane as it is used continuously in the process.

The company has a responsibility to follow all Local, State, and Federal regulations. All employees will be trained to properly handle, store, and dispose of hazardous waste in accordance with EPA regulations 49CFR and 40CFR.

Furthermore, as stated earlier, the storage of hazardous material requires the oversight of state and federal environmental protection agencies. This type of monitoring will ensure that the pentane gas is stored a safe and proper manner during the life of the plant, and that any emissions are not detrimental to the safety and welfare of the public.

(5) Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the safety, security, location, purpose or mission of the military installation.

Response: N/A

WOOD RODGERS

June 29, 2020

Dan Cahalane
Planner
Community Services Department – Planning & Building Division
1001 E. Ninth St., Bldg A.
Reno, NV 89512

RE: Response to Comments for Ormat Geothermal WSUP20-0013 request for a variance regarding Article 410 and 412 landscape standards (Via Email)

Dear Dan,

Wood Rodgers, Inc. received a request for additional information on June 24, 2020, regarding WSUP20-0013– A Special Use Permit request to allow for development of a geothermal energy production site located 6.2 miles southwest of State Highway 447 and Rodeo Creek Road in the High Desert and Truckee Canyon Planning Areas. Please see the following responses to the requested information:

1. *Article 410 – Requires all parking and maneuvering spaces to be paved. Please send me a letter requesting to vary this standard if you do not want to pave all required parking spaces.*

Response: The applicant is requesting that this standard be considered as a Variance as part of the SUP request since paved parking is generally intended for the urban environment. The location of the project is very remote and does not include services like storm water utilities including curb and gutter which are generally included with the installation of pavement.

2. *Article 412 – Varying landscaping standards – Please send me a letter requesting to vary the screening, landscaping, and fencing standards that you've included in your application.*

Response: According to Section 110.412.10 (d), "…the provisions of this article may be waived during the approval process for use types classified under energy production…" As part of this SUP the applicant is requesting that the landscape standards be waived in accordance with the section above to help the project meet the Character Statement outlined in the High Desert Area Plan.

Several policies, including Policy HD.16.5 encourage the use of native drought tolerant plants to be used in the landscape. This is consistent with what the applicant is proposing in accordance with the Bureau of Land Management (BLM) standards. This is proposed along areas where temporary grading has occurred and does not include roads, well pads, and maintenance areas around building. Proposing formal landscaping including trees and screening shrubs in accordance with Section 110.412 would have a negative visual impact on the area and take away from the character of the area since the native vegetation does not include plant types typically found in more formal landscaping, including the use of trees. Furthermore, the client is proposing the use of chain-link fence. This too will have less of a visual impact from the surrounding properties while still keeping the area secure from the public and wildlife.

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If you have any questions or need anything else for this project, please do not hesitate to contact me.

Thank you,

Andrew D. Durling, AICP, LEED AP
Vice President - Planning

Pentane

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Pentane**

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: **S25457**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Flammable
Flammable liquids, category 2

Health hazard
Aspiration hazard, category 1

Irritant
Specific target organ toxicity following single exposure, category 3

Environmentally Damaging
Chronic hazards to the aquatic environment, category 2

Flam. Liq. 2
Asp. Tox. 1
STOT SE3
Aquatic Chronic 2

Signal word :Danger

Hazard statements:
Highly flammable liquid and vapour
May be fatal if swallowed and enters airways
May cause drowsiness or dizziness
Toxic to aquatic life with long lasting effects

Precautionary statements:
If medical advice is needed, have product container or label at hand
Keep out of reach of children

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Read label before use
Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/light/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Wear protective gloves/protective clothing/eye protection/face protection
Avoid release to the environment
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.
Continue rinsing
In case of fire: Use ... for extinction
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Collect spillage
Store in a well ventilated place. Keep cool
Store locked up
Dispose of contents and container to an approved waste disposal plant

Other Non-GHS Classification:

WHMIS

B2

NFPA/HMIS

NFPA SCALE (0-4)

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 109-66-0	n-Pentane	100 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Loosen clothing as necessary and position individual in a comfortable position.Move exposed to fresh air. Give artificial respiration if necessary. If breathing is difficult give oxygen.Get medical assistance if

cough or other symptoms appear.

After skin contact: Rinse/flush exposed skin gently using soap and water for 15-20 minutes.Seek medical advice if discomfort or irritation persists.

After eye contact: Protect unexposed eye.Rinse/flush exposed eye(s) gently using water for 15-20 minutes.Remove contact lens(es) if able to do so during rinsing.Seek medical attention if irritation persists or if concerned.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if irritation, discomfort, or vomiting persists.Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:

Irritation.Headache.Nausea.Shortness of breath.;

Indication of any immediate medical attention and special treatment needed:

If seeking medical attention provide SDS document to physician. Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Carbon oxides.Thermal decomposition can lead to release of irritating gases and vapors.

Advice for firefighters:

Protective equipment: Use NIOSH-approved respiratory protection/breathing apparatus.

Additional information (precautions): Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation.Ensure that air-handling systems are operational.

Environmental precautions:

Should not be released into environment.Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Always obey local regulations.If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Keep in suitable closed containers for disposal.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Avoid contact with skin, eyes, and clothing.Do not eat, drink, smoke, or use personal products when handling chemical substances.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages.Protect from freezing and physical damage.Provide ventilation for containers. Keep container tightly sealed.Store away from incompatible materials.

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SECTION 8 : Exposure controls/personal protection



Control Parameters: 109-66-0, Pentane, NIOSH TWA 350 mg/m3
109-66-0, Pentane, ACGIH TLV TWA 600 ppm
109-66-0, Pentane, OHSA PEL TWA 1000 ppm

Appropriate Engineering controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above.

Respiratory protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls.When necessary use NIOSH approved breathing equipment.

Protection of skin: Select glove material impermeable and resistant to the substance.Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves.Wear protective clothing.

Eye protection: Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).Safety glasses or goggles are appropriate eye protection.

General hygienic measures: Perform routine housekeeping. Wash hands before breaks and at the end of work. Avoid contact with skin, eyes, and clothing.Before wearing wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	**Explosion limit lower**: **Explosion limit upper**:	Not Determined Not Determined
Odor:	Gasoline-like odor	**Vapor pressure**:	573 mbar @ 20°C
Odor threshold:	Not Determined	**Vapor density**:	2.5 (Air = 1)
pH-value:	Not Determined	**Relative density**:	0.626
Melting/Freezing point:	- 130 ° C / - 202°F	**Solubilities**:	Material is slightly water soluble.
Boiling point/Boiling range:	36 ° C / 96.8°F	**Partition coefficient (n-octanol/water)**:	Not Determined
Flash point (closed cup):	- 49°C / - 56.2°F	**Auto/Self-ignition temperature**:	Not Determined
Evaporation rate:	28.6	**Decomposition temperature**:	Not Determined

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Pentane

Flammability (solid,gaseous):	Very flammable	**Viscosity**:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined			

SECTION 10 : Stability and reactivity

Reactivity: Nonreactive under normal conditions.
Chemical stability: Stable under normal conditions.
Possible hazardous reactions: None under normal processing.
Conditions to avoid: Incompatible materials.Ignition sources, excess heat.
Incompatible materials: Strong oxidizing agents.
Hazardous decomposition products: Oxides of carbon.

SECTION 11 : Toxicological information

Acute Toxicity:		
Oral:	5,000 mg/kg	LD50 mouse
Inhalation:	4 h - 364,000 mg/m3	LC50 rat
Dermal:	3,000 mg/kg	LD50 rabbit
Chronic Toxicity: No additional information.		
Corrosion Irritation: No additional information.		
Sensitization:		No additional information.
Single Target Organ (STOT):		No additional information.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.
Reproductive Toxicity:		No additional information.

SECTION 12 : Ecological information

Ecotoxicity

EC50 - Daphnia magna (Water flea): 9.74 mg/l - 48 h

Persistence and degradability:
Bioaccumulative potential:
Mobility in soil:
Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Contact a licensed professional waste disposal service to dispose of this material.Dispose of empty containers as unused product.It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Chemical waste generators must determine

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whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1465

UN proper shipping name

Pentanes

Transport hazard class(es)

Class:
3 Flammable liquids

Packing group:II
Environmental hazard:
Transport in bulk:
Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Chronic, Fire

SARA Section 313 (Specific toxic chemical listings):

None of the ingredients is listed

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

None of the ingredients is listed

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

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None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

None of the ingredients is listed

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:
IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 02.10.2015
Last updated : 03.19.2015

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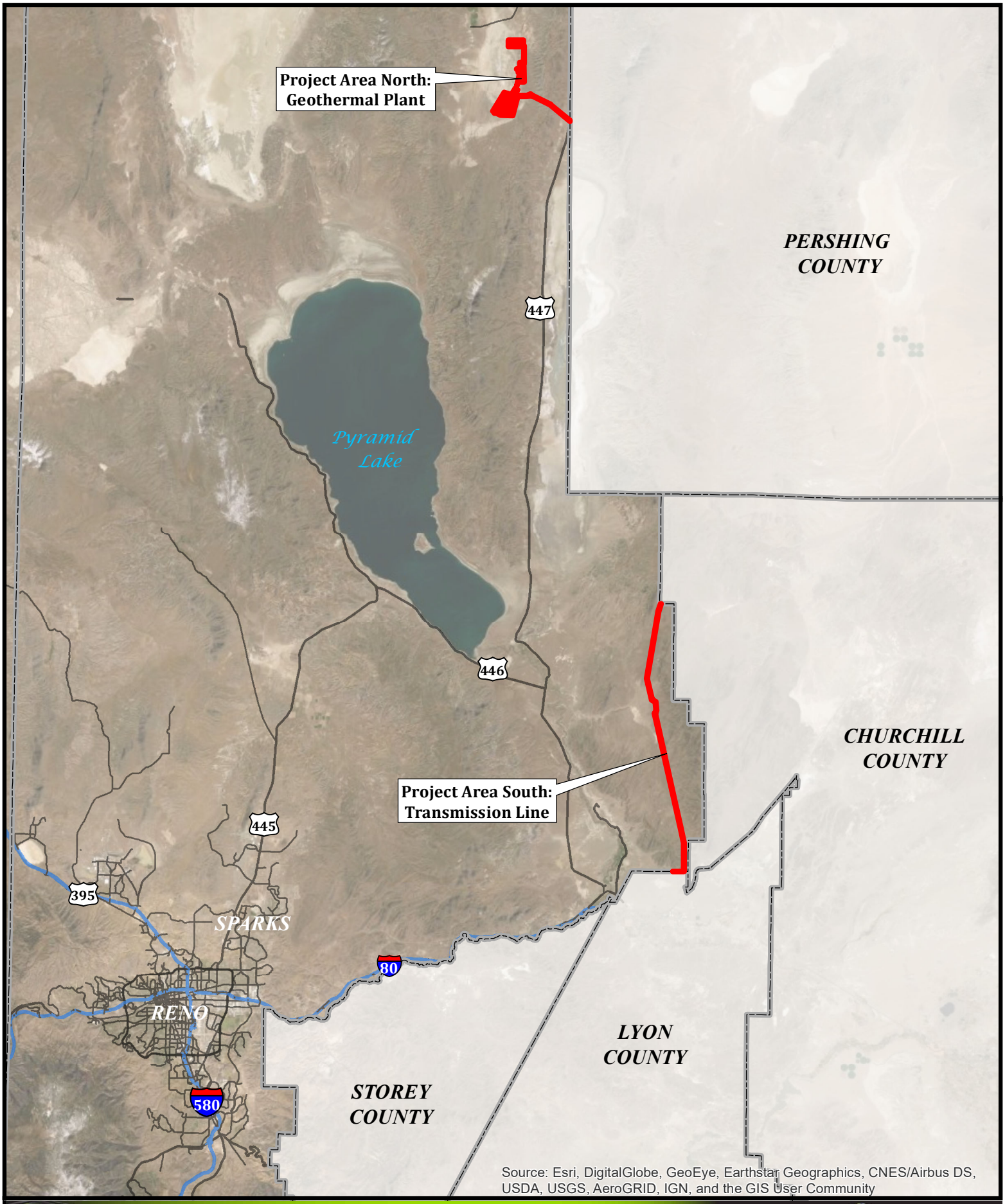

Vicinity Map

Ormat North Valleys Geothermal Plant

May 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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APN
071-060-18

APN 071-070-16

APN
071-070-09

APN
071-070-18

APN
071-070-19

APN
071-070-12

APN
071-070-13

APN
071-030-06

APN 071-030-07

PERSHING COUNTY

Legend

- Parcels
- Project Boundary
- County Boundary

0 1/4 1/2

MILES

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Ormat North Valley Geothermal: Project Area North Aerial Map

Washoe County, July, 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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APN 079-320-04
APN 079-320-55
APN 079-320-42
APN 079-320-12
APN 079-320-47
APN 079-320-18
APN 079-320-52
APN 079-170-02
APN 079-170-39
APN 079-570-13
APN 079-570-12
APN 079-570-07
APN 079-570-06
APN 079-570-01
APN 079-570-02
APN 079-180-34
APN 079-180-02
APN 079-180-37
APN 079-180-12
APN 079-180-44
APN 079-180-45

VALLEY RD

CHICKEN RANCH RD

Churchill

Lyon

0 ½ 1
MILES

Legend
- Parcels
- Proposed Transmission Line

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Ormat North Valley Geothermal: Project Area South Aerial Map

Washoe County, May 2020

WOOD RODGERS
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1361 Corporate Boulevard
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R

PERSHING COUNTY

Legend

- Parcels
- Project Boundary
- County Boundary

Washoe County Master Plan

- R - Rural

0 1/4 1/2

MILES

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Ormat North Valley Geothermal: Project Area North Master Plan

Washoe County, July, 2020

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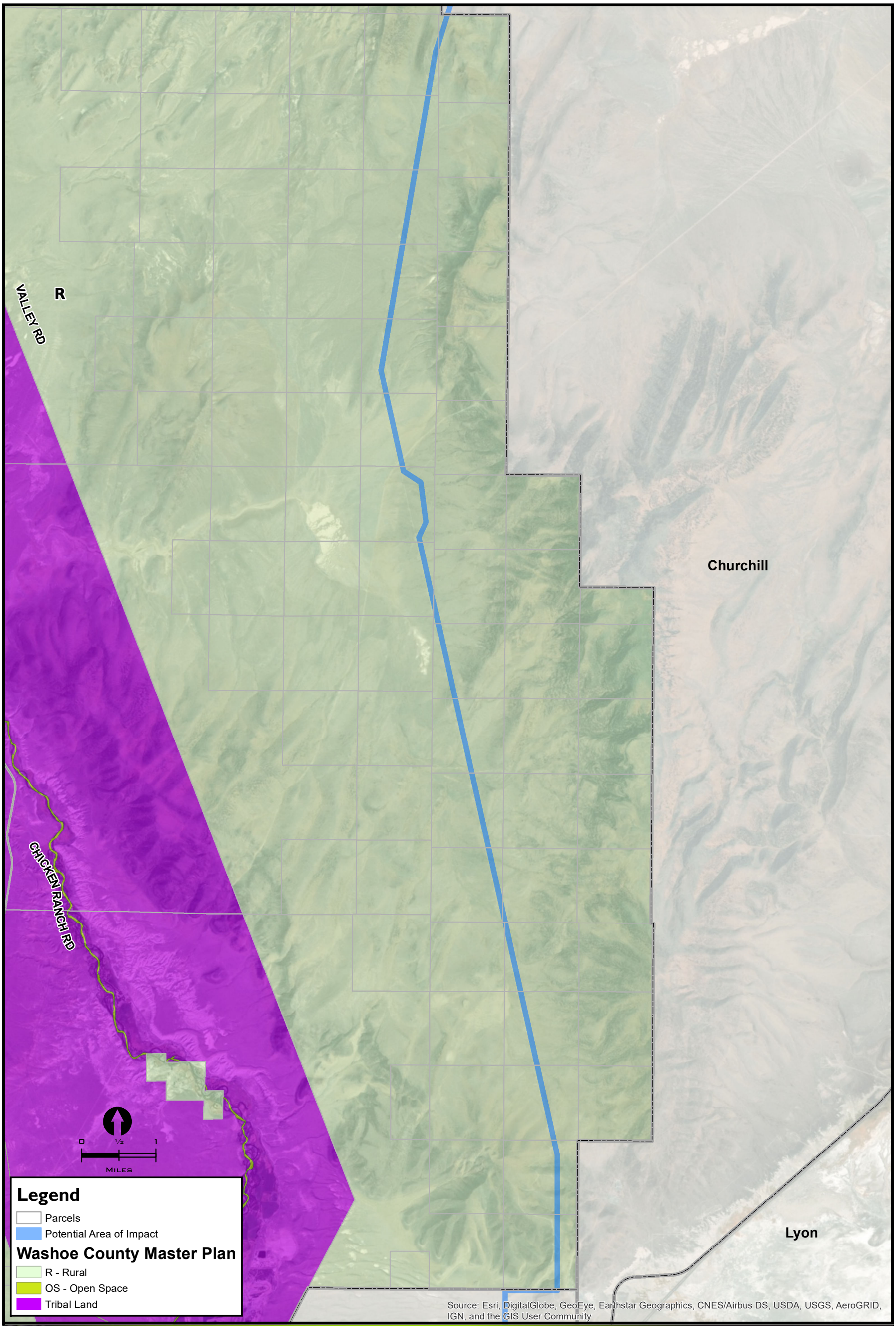

Ormat North Valley Geothermal: Project Area South Master Plan

Washoe County, May 2020

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GR

PERSHING COUNTY

Legend

- Parcels
- Project Boundary
- County Boundary

Washoe County Zoning

- GR - General Rural

0 1/4 1/2

MILES

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Ormat North Valley Geothermal: Project Area North Zoning

Washoe County, July, 2020

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GR

VALLEY RD

CHICKEN RANCH RD

Churchill

Lyon

0 ½ 1
MILES

Legend

- Parcels
- Potential Area of Impact

Washoe County Zoning

- GR - General Rural
- Tribal Land

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Ormat North Valley Geothermal: Project Area South Zoning

Washoe County, May 2020

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June 15, 2020
Project No. 1707005

Re: Geotechnical Due Diligence
Ormat North Valleys Geothermal Plant Project
Washoe County, Nevada

Ref: International Building Code 2018, *International Code Council.* (2018 IBC)

Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-16, *American Society of Civil Engineers.* (ASCE 7-16)

Standard Specifications for Public Works Construction, Regional Transportation Commission of Washoe County, 2016, Revision No. 9

We are pleased to present our due diligence review letter for the referenced project located in Washoe County, Nevada. The purpose of our due diligence review is to provide a summary of geotechnical considerations that could potentially impact the development of the property and has been based on review of readily available published documents.

PROJECT DESCRIPTION

The project consists of developing a large scale geothermal power plant facility. Site improvements will consist of geothermal wells and well pads, up to two ±20 megawatt energy generation facilities, geothermal fluid pipelines, access roads, an electrical transmission line, and ancillary support structures.

The development's grading will likely include cut to fill. Cuts and fills are anticipated to approach ±7-feet.

SITE DESCRIPTION

The development area, located in Washoe County, Nevada, has a central latitude and longitude of 40.3743°N and -119.4050°E, respectively (Google Earth). The Vicinity Map is presented in Figure 1; the Site Map is presented in Figure 2.

Per Google Earth, existing development within the area of interest includes the U.S. Geothermal San Emidio Geothermal Plant approximately 0.4 miles northeast of the power generation facilities. Bordering the project site is the Wind Mountain mining operation to the north and open land to the west, east, and south. Several unpaved access roads are located across the site.

GEOLOGIC AND GENERAL SOIL AND GROUNDWATER RESEARCH

Based on Preliminary geologic map of the northern Lake Range, San Emidio geothermal area, Washoe County, Nevada (Rhodes, Faulds, and Ramelli 2011), the site is mapped in an area of Quaternary alluvial

WSUP20-0013
EXHIBIT P

deposits (Qfy), playa deposits (Qpf & Qp), fresh water lakebeach deposits (Qb), Tertiary volcanic units including tuffaceous rocks (Tpts), basaltic andesite (Tbp'), and various metasediments (TrJn). The geologic map is shown in Figure 3A; the Geologic Map Legend is presented in Figure 3B.

In addition to our review of the NBMG geologic map, soil survey maps prepared by the United States' Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) were reviewed. NRCS characterizes the site as consisting of silt (ML) and silty sand (SM), medium to high plasticity clays (CL/CH), and nonplastic to low plasticity gravel (GC-GM) to a depth of approximately 5-feet. Bedrock is mapped at approximately 2-feet below the ground surface where the transmission line extends east of the power plants.

Nevada Division of Water Resources (NDWR) well logs indicate the static water level in the area of the project varies between 6 and 46-feet below the existing ground surface.

CORROSIVITY CONSIDERATIONS

NRCS has identified the area of interest to present a low to high corrosion potential to concrete and high corrosion potential to uncoated steel elements. The USDA's NRCS information containing the Soil Map, Engineering Properties, and Corrosion Potential are attached in Appendix B of this report.

SEISMIC HAZARDS

The area lies within the Basin and Range physiographic province. The Basin and Range province is characterized by a series of valleys bounded by north/south trending mountain ranges. The Basin Range is defined as the seismically active zones between the Wasatch Front in Utah and the Sierra Nevada Mountains along the California/Nevada border. Faulting and seismic activity are integral to the formation of this series of alternating valleys and mountain ranges. As a consequence, the presence of faults, active and inactive, is common throughout the province.

Surface Rupture

The criteria for evaluating earthquake faults has been formulated by a professional committee for the State of Nevada Earthquake Safety Council. The guidelines present that faults with evidence of movement within the past 10,000 years (Holocene time) are considered Holocene Active for routine residential and commercial projects. Faults with evidence of displacement within the last 130,000 years are considered Late Quaternary Active and faults with movement within the last 1.6 million years are considered Quaternary Active. The USGS U.S. Quaternary Faults was accessed to review the proximity of any active faults as previously characterized, and is presented in Figure 4. Several Undifferentiated Quaternary aged faults, that are part of the San Emidio fault zone, are mapped approximately 0.3 miles east of the power generation facilities but do transect some northern well pads. These faults will require a more detailed investigation during the design level geotechnical report.

Liquefaction

Liquefaction is a loss of soil shear strength that can occur during a seismic event, as excessive pore water pressure, between the soil grains, is induced by cyclic shear stresses. This phenomenon is limited to poorly consolidated (Standard Penetration Test less than 30, overburden stress corrected shear wave velocity less than 700 fps) clean to silty sand/sandy silt lying below the ground water table (typically less than 50 feet deep).

A 50-foot liquefaction boring(s) utilizing mud rotary drilling techniques should be considered during the design level geotechnical investigation in order to more definitively assess the liquefaction potential. An alternative method to analyzing the liquefaction potential may utilize shear wave velocity measurements via geophysical testing.

Slope Instability

The site and surrounding topography are such that the potential for slope instability at the site due to seismic activity is considered remote.

PRELIMINARY SOIL PROFILE TYPE AMPLIFICATION FACTORS

In accordance with ASCE 7-16 and the Northern Nevada Amendments of the 2018 IBC, Site Class D (default) has been assigned to the project. The correct Site Classification will be determined during the design level geotechnical investigation. Preliminary seismic design values for this due diligence study were determined based on a representative latitude and longitude of 40.3743°N and -119.4050°E, respectively. Per ASCE 7-16, the site's modified Peak Ground Acceleration to be used for engineering analyses is equal to 0.494g. Risk Category III and IV have been presented for the structural engineer's consideration. The ASCE 7 Hazards Reports are presented in Appendix C.

GRADING CONSIDERATIONS AND PRELIMINARY RECOMMENDATIONS

All vegetation and topsoil should be cleared and grubbed from structural areas. Clearing and grubbing depths are anticipated to generally range from two to six inches. Localized deeper removal may be required in areas of large brush and trees, if encountered. Vegetation and organic debris should be disposed of offsite or placed in designated non-structural areas with the owner's permission.

The site will likely be graded cut to fill. Structural fill is defined as any material placed below structural elements and includes foundations, concrete slabs-on-grade, pavements, or any structure that derives support from the underlying soil. Depending on the proposed grading plan and index properties of the native soils providing structural support, as determined from the design level geotechnical investigation, imported structural fill, or structural fill mined from a nearby source, will likely be required to create a separation layer between structural improvements and clay/fine grained soils. The extent of the clay/fine grained soil will be determined during the design level geotechnical investigation; however, based on public data, clay/fine-grained soils are anticipated to be encountered in the area where the majority of the proposed site improvements are located. An on-site source of structural fill should be investigated in the

higher pediment areas during the design level investigation which may result in limiting the amount of imported soil necessary. Typical separation thicknesses for the anticipated clay soils will likely be two to three-feet below foundations and up to one and a half feet below slabs-on-grade and site improvements, not including the base course section. Expansive soils may require placement in designated non-structural areas or off-hauling during grading activities.

Mass grading will require part-time observation and testing services of a qualified materials testing and inspection firm.

Grading of underground utilities should be completed with ordinary heavy duty construction equipment. Fine grained soils present in the project area will not be suitable for use as bedding and backfill. Importation of pipe bedding and trench backfill will likely be required. Wet trench conditions are not anticipated to be encountered on-site for shallow utilities. Deep manholes or trenches greater than approximately 6 feet below the existing surface may encounter groundwater or the effects therefrom. Verification of groundwater and seasonal high groundwater should be addressed by the design level geotechnical investigation and report.

Groundwater could be encountered at relatively shallow depths according to Nevada Division of Water Resources (NDWR) well logs (i.e. 6-feet). Excavations for the underground storage tanks or utility trenches that approach groundwater or that extend to within the zone of influence of groundwater will have a greater tendency to slough or cave and must be adequately considered and planned for by the contractor. If underground storage tanks are placed within the groundwater depth, then tie down anchors or other methods may be required to counteract hydrostatic pressure acting on the tank when at low fill volumes.

FOUNDATION ALTERNATIVES

Suitable foundation systems will hinge of the findings of the design level geotechnical report; however, standard spread foundations should perform adequately for the well pads if competent material is encountered or where structural fill separation layers are incorporated. Mat foundations, standard spread foundations, drilled shafts, or a combination thereof will likely be recommended for the power plant buildings and related structures; drilled shafts, micro-piles or large concrete mat foundations will likely be necessary for the transmission line support structures.

Due to the potentially corrosive nature of the site's soils, Type V concrete will likely be required.

ACCESS ROAD CONSIDERATIONS

Surface gravel sections for temporary access roads will likely consist of 4 to ±6-inches Type 2 Class B aggregate base. Permanent access roads will likely require from 6 to ±10-inches of aggregate base. The alternative surface gravel design section thicknesses should be addressed in the design level geotechnical report.

SUMMARY

Although the site presents some constraints that bear closer scrutiny, the site does not present geotechnical conditions that cannot be reasonably mitigated. We appreciate the opportunity to provide this due diligence geotechnical letter. Please note that this document has been prepared based on published data. Varying conditions, and conditions not yet identified, may come to light or may be encountered during development of a design-level geotechnical report. Please contact our office if you have any related questions.

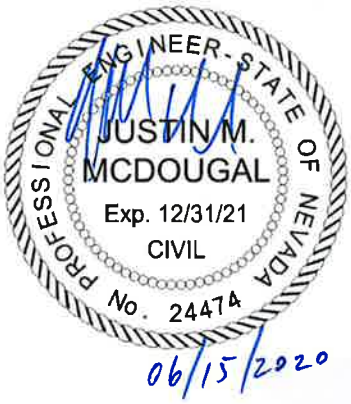
Wood Rodgers can provide both civil engineering support and full service construction testing and special inspection support for the project. We would be happy to provide a proposal for those services at the appropriate time. Thank you for the opportunity to be of service.

Sincerely,

WOOD RODGERS, INCORPORATED

Justin M. McDougal, PE
Associate
RE Number: 24474
Expires 12/31/2021

Enclosures



Gary C. Luce, PE
Sr. Geotechnical Engineer

Appendix A: Figures
Figure 1 - Vicinity Map
Figure 2 - Site Map
Figure 3 - Geologic Map
Figure 4 - Quaternary Fault Map

Appendix B: USDA NRCS Information

Appendix C: Preliminary Seismic Design Values

APPENDIX A
FIGURES

FIGURE 1 - VICINITY MAP
ORMAT NORTH VALLEYS GEOTHERMAL PLANT
WASHOE COUNTY, NV
JUNE 2020

NORTH

0 5 10
MILES

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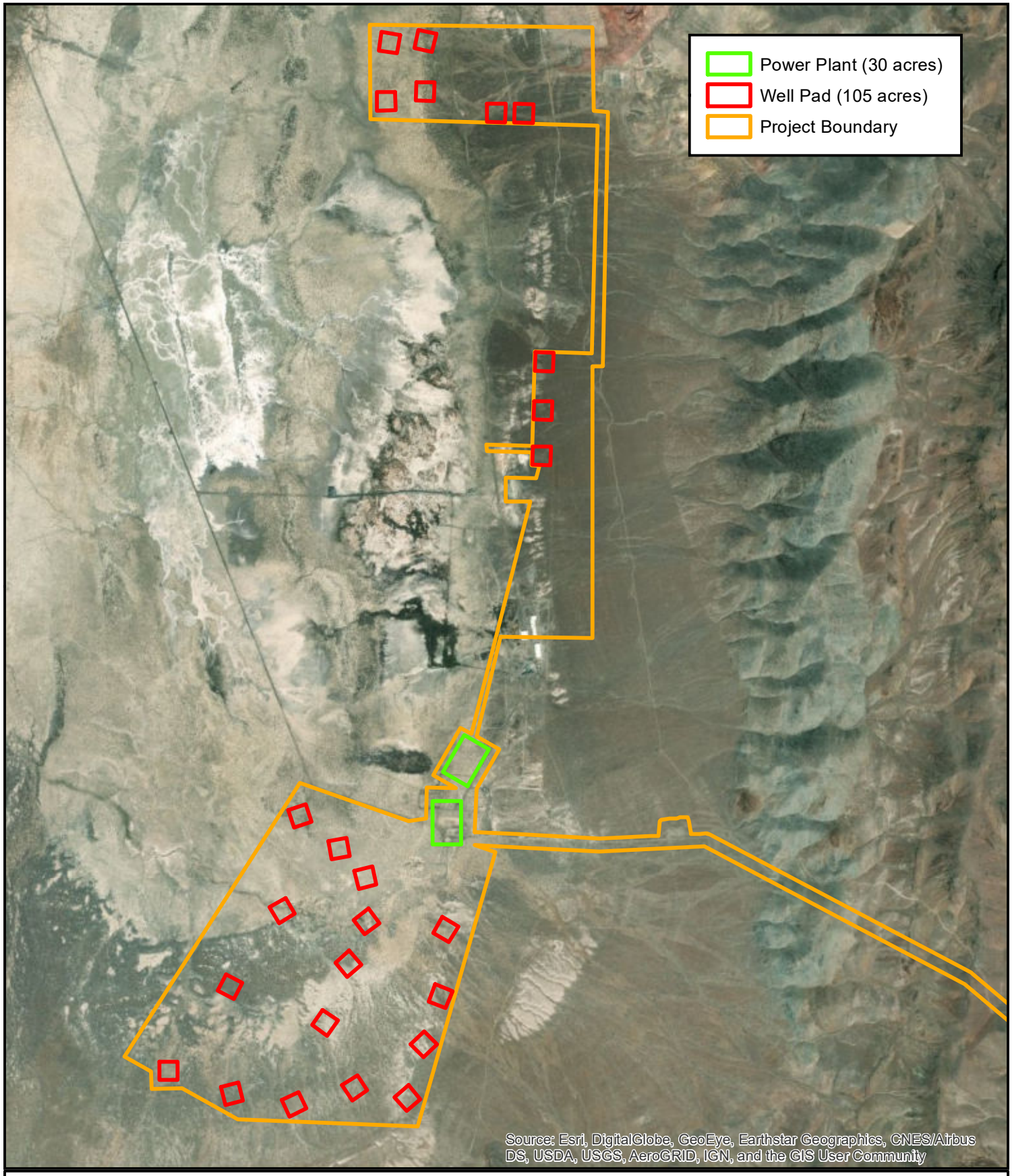

FIGURE 2 - SITE MAP
ORMAT NORTH VALLEYS GEOTHERMAL PLANT
WASHOE COUNTY, NV
JUNE 2020

NORTH

0 1,250 2,500

FEET

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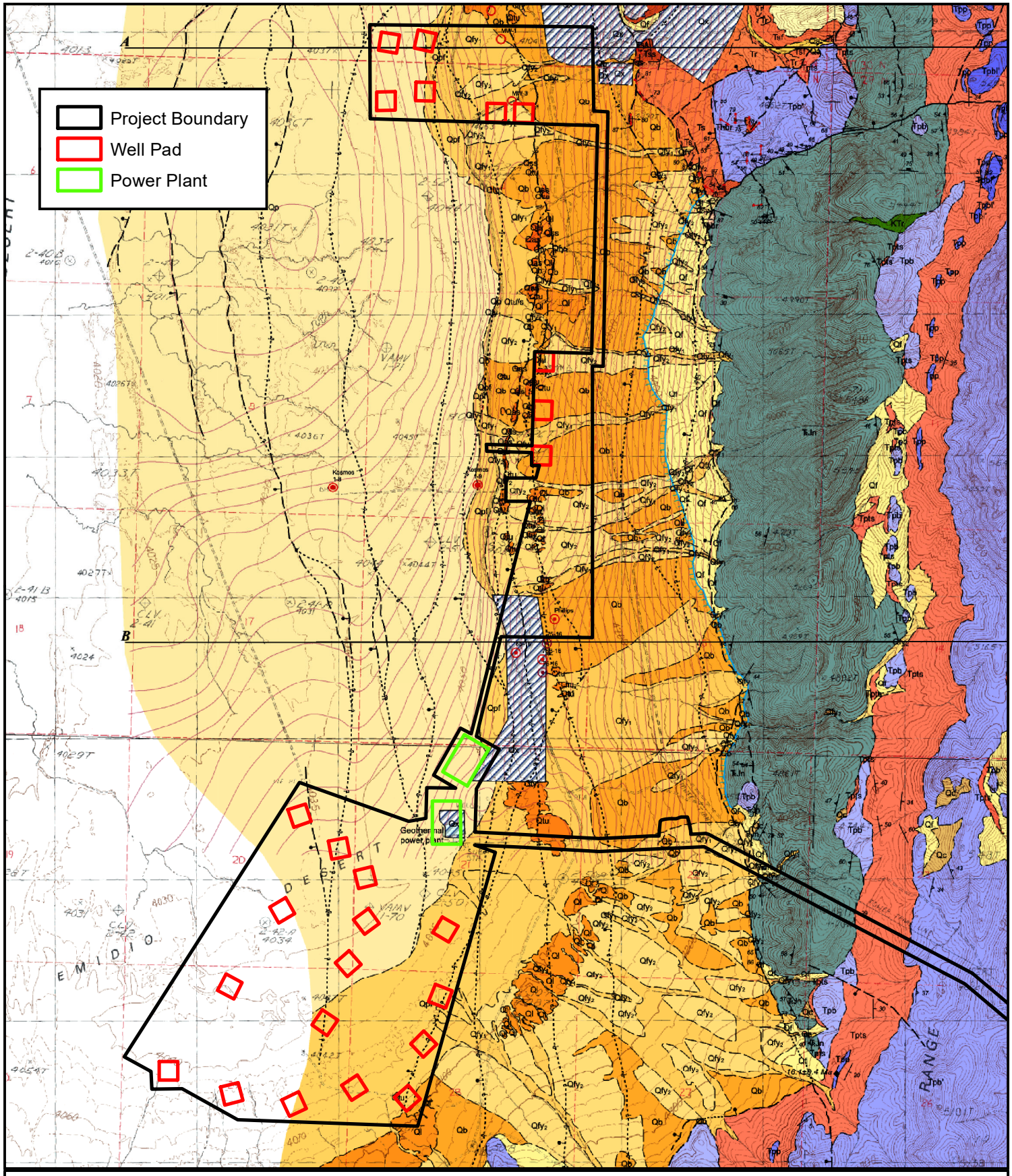

FIGURE 3A - GEOLOGIC MAP
ORMAT NORTH VALLEYS GEOTHERMAL PLANT
WASHOE COUNTY, NV
JUNE 2020

NORTH

0 1,250 2,500

FEET

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Anthropogenic Features and Deposits

- Qx — Disturbed and modified areas

Playa and Related Deposits

- Qp — Playa deposits (latest Holocene to late Pleistocene)
- Qpf — Playa fringe deposits (Holocene to late Pleistocene)

Hillslope Deposits

- Qc — Colluvium (Holocene to Pleistocene)

Alluvial Deposits

- Qa — Young alluvium, undivided (Holocene to late Pleistocene)
- Qfy — Young active fan alluvium and recently abandoned active alluvial surfaces (Holocene)
- Qfy_1 — Young active fan alluvium (late Holocene)
- Qfy_2 — Young fan alluvium, undivided (Holocene to late Pleistocene)
- Qf — Fan alluvium, undivided (Holocene to late Pleistocene)
- Qfi — Intermediate fan alluvium, undivided (late to middle Pleistocene)
- Qfo — Old fan alluvium, (middle to early Pleistocene)
- Qss — Silicified alluvium, undivided (Holocene to Pleistocene)
- Qas — Acid-sulfate altered alluvium, undivided (Holocene to Pleistocene)
- Qasfg — Acid-sulfate altered fanglomerate (Holocene to Pleistocene)
- Qtg — Terrace gravels, undivided (late Holocene to Pleistocene)
- QTa — Basin fill alluvium, undivided (late Holocene to late Tertiary) (In cross section only)

Quaternary Lacustrine Deposits

- Qtu — Subaqueous spring-related tufa deposits (middle Holocene to late Pleistocene)
- Qtu/s — Subaqueous spring-related tufa and siliceous sinter deposits (middle Holocene to late Pleistocene)
- Ql — Shallow lake sediments (middle Holocene to late Pleistocene)
- Qb — Beach deposits (middle Holocene to late Pleistocene)

Tertiary Rocks

- Tgc — Fault related gypsum and calcite deposits
- Tcv — Fault related sheeted calcite veins
- Tsf — Non-indurated sedimentary rocks and fan alluvium
- Tss — Silicified sedimentary rocks
- Tr — Rhyolitic tuff
- Ts — Sedimentary rocks (late Miocene to Pliocene)
- Tcla — Clay-rich sedimentary rocks
- Tapb — Hydrothermally altered lower Pyramid sequence volcanic rocks
- Thbr — Hydrothermal breccia

Pyramid Sequence

- Tpd — Dacite
- Tpts' — Tuffaceous sedimentary and volcaniclastic rocks
- Tpb' — Sparsely porphyritic basaltic andesite
- Tpts — Tuffaceous sedimentary and volcaniclastic rocks
- Tptsu — Tuffaceous sedimentary and volcaniclastic rocks, undivided (In cross section only)
- Tpbl' — Sparsely porphyritic basaltic andesite
- Tpp — Porphyritic basaltic andesite
- Tpb — Basalt

Lower Miocene Volcanic Rocks

- Td — Dacite

Cretaceous Intrusions

- KTr — Flow-banded rhyolite dikes

Triassic and Jurassic Nightingale Formation

- TrJn — Metasediments including phyllite, quartzite, and marble

FIGURE 3B - GEOLOGIC MAP LEGEND

ORMAT NORTH VALLEYS GEOTHERMAL PLANT
WASHOE COUNTY, NV
JUNE 2020

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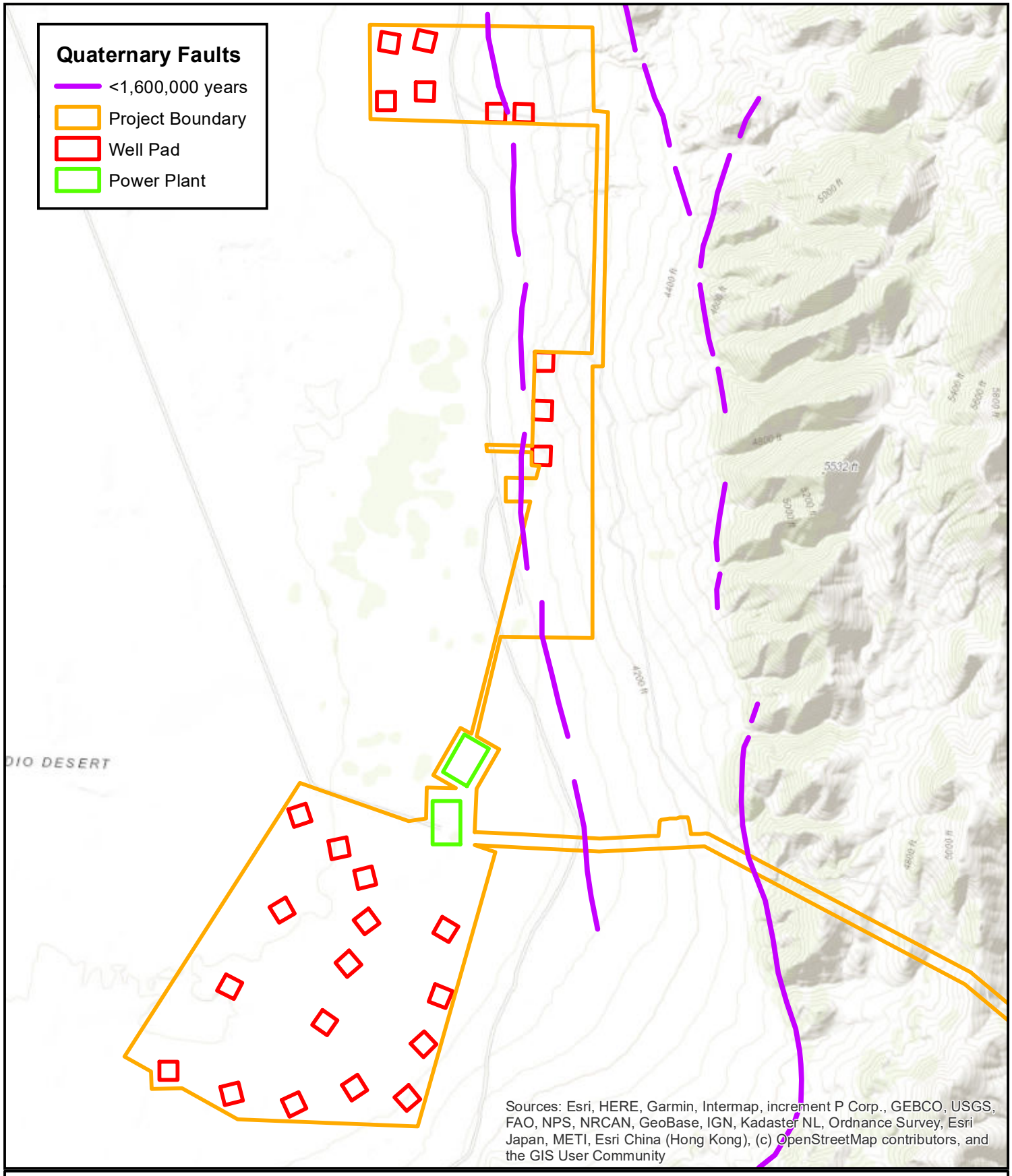

FIGURE 4 - QUATERNARY FAULT MAP
ORMAT NORTH VALLEYS GEOTHERMAL PLANT
WASHOE COUNTY, NV
JUNE 2020

NORTH

0 1,250 2,500

FEET

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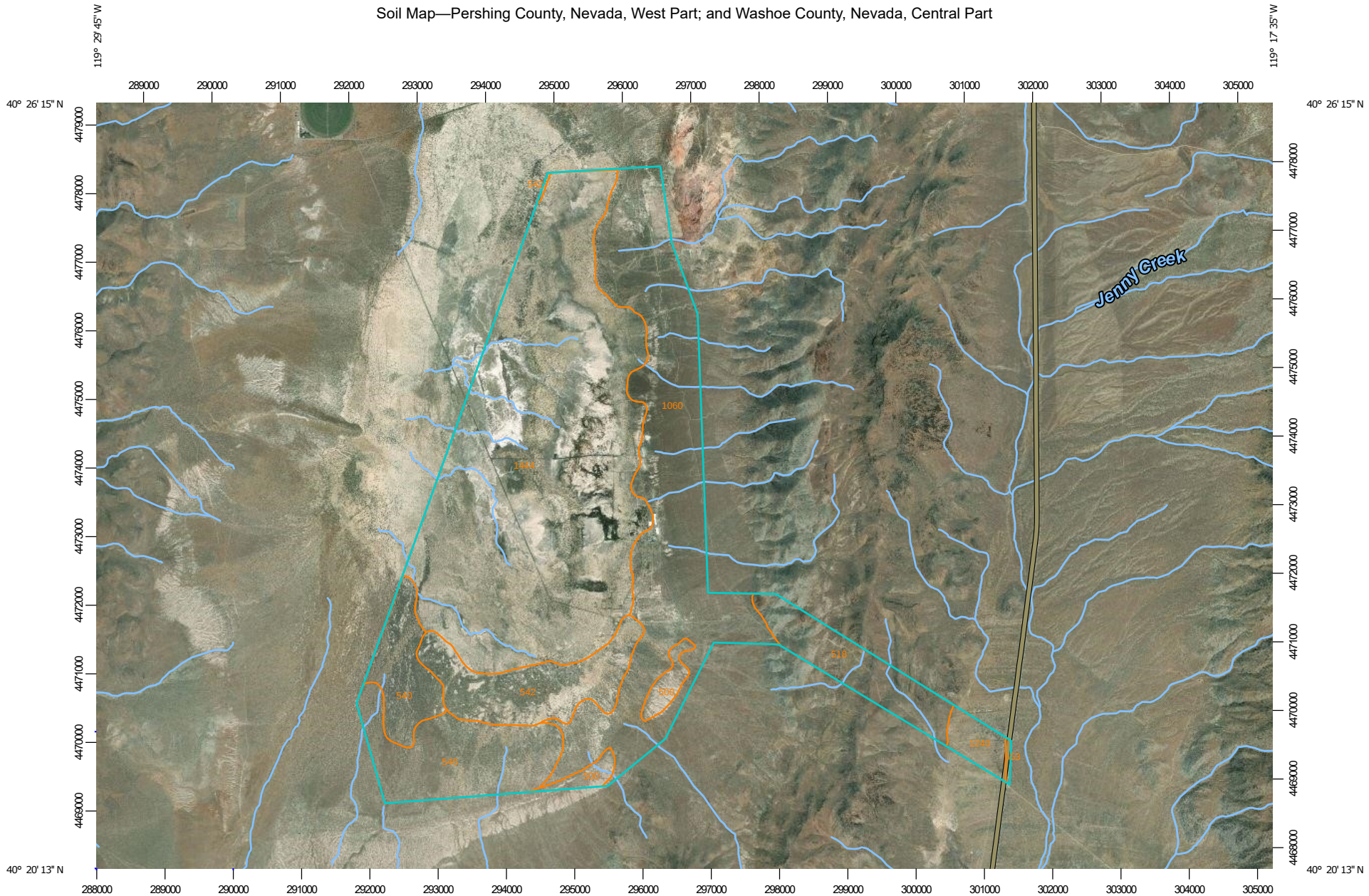
APPENDIX B
USDA NRCS INFORMATION

Soil Map—Pershing County, Nevada, West Part; and Washoe County, Nevada, Central Part



Map Scale: 1:78,700 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 3500 7000 14000 21000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

USDA **Natural Resources Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

6/2/2020
Page 1 of 3

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MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pershing County, Nevada, West Part
Survey Area Data: Version 15, Sep 16, 2019

Soil Survey Area: Washoe County, Nevada, Central Part
Survey Area Data: Version 11, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 11, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
653	Labkey-Mazuma association	10.5	0.1%
Subtotals for Soil Survey Area		**10.5**	**0.1%**
Totals for Area of Interest		**8,967.3**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
500	Smaug very fine sandy loam, 2 to 8 percent slopes	153.3	1.7%
518	Bucklake-Pickup-Wylo association	467.2	5.2%
540	Mazuma complex, 0 to 4 percent slopes	366.7	4.1%
542	Mazuma-Ragtown association	628.5	7.0%
546	Mazuma association	741.0	8.3%
1060	Trocken-Mazuma association	2,309.4	25.8%
1240	Labkey-Mazuma association	136.8	1.5%
1444	Umberland silty clay loam, ponded	4,154.1	46.3%
Subtotals for Soil Survey Area		**8,956.8**	**99.9%**
Totals for Area of Interest		**8,967.3**	**100.0%**

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Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

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Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

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American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

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Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Pershing County, Nevada, West Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
653—Labkey-Mazuma association														
Labkey	55	A	0-4	Gravelly sandy loam	SM	A-2, A-1	0- 0- 0	0- 0- 0	80-90-100	55-65-75	35-45-55	20-28-35	16-20 -25	NP
			4-12	Gravelly coarse sandy loam, gravelly sandy loam	SM	A-1, A-2	0- 0- 0	0- 0- 0	80-90-100	50-60-70	25-35-45	15-23-30	16-20 -25	NP
			12-60	Stratified extremely gravelly coarse sand to gravelly sandy loam	SM, SP-SM	A-1	0- 0- 0	0- 0- 0	60-70-80	25-35-45	10-18-25	5-10- 15	0-17 -21	NP
Mazuma	30	A	0-6	Fine sandy loam	SM	A-4, A-2	0- 0- 0	0- 0- 0	95-98-100	85-93-100	70-78-85	30-40-50	20-23 -25	NP-3 -5
			6-60	Stratified gravelly coarse sand to silt loam	SM	A-4	0- 0- 0	0- 0- 0	95-98-100	75-88-100	70-80-90	35-43-50	20-23 -25	NP-3 -5

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Engineering Properties–Washoe County, Nevada, Central Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
500—Smaug very fine sandy loam, 2 to 8 percent slopes														
Smaug	85	C	0-10	Very fine sandy loam	ML	A-4, A-5	0- 0- 0	0- 0- 0	95-98-100	90-95-100	80-85-90	50-58-65	30-40 -50	NP
			10-60	Silt loam, very fine sandy loam	ML	A-4, A-5	0- 0- 0	0- 0- 0	98-100-100	95-98-100	95-98-100	70-85-100	30-40 -50	NP-3 -5

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Engineering Properties–Washoe County, Nevada, Central Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
518—Bucklake-Pickup-Wylo association														
Bucklake	35	D	0-8	Very stony loam	CL, CL-ML, SC, SC-SM	A-4, A-6	25-25-45	10-15-35	70-83-90	65-75-80	55-63-70	40-48-55	25-30-35	5-10-15
			8-12	Gravelly clay loam	CL, GC	A-6	0- 0- 0	0- 2- 8	60-66-80	55-58-70	45-55-65	40-48-55	30-35-40	10-15-20
			12-24	Gravelly clay, gravelly clay loam	CL, CH, GC	A-7	0- 0- 0	0- 8- 10	60-76-90	55-68-80	45-55-65	40-50-60	40-50-60	20-28-35
			24-34	Bedrock	—	—	—	—	—	—	—	—	—	—
Pickup	30	D	0-2	Very stony loam	GC, GC-GM	A-2	10-15-25	10-15-20	50-56-65	45-48-55	30-38-45	20-28-35	25-30-35	5-10-15
			2-8	Very gravelly loam	GC, GC-GM	A-2	0- 0- 5	0- 0- 5	45-53-60	40-45-50	30-38-45	20-28-35	25-30-35	5-10-15
			8-34	Very gravelly clay, very gravelly clay loam	GC	A-2, A-7	0- 0- 5	0- 3- 25	35-56-60	30-48-50	25-43-45	20-35-40	45-53-60	20-25-30
			34-44	Bedrock	—	—	—	—	—	—	—	—	—	—
Wylo	20	D	0-4	Very cobbly loam	GC, GC-GM, GM, SC	A-2, A-4	8- 8- 15	15-25-30	60-65-75	50-53-60	40-45-55	30-40-50	25-30-35	5-8 -10
			4-15	Gravelly clay, gravelly clay loam, cobbly clay	GC, SC	A-7	0- 2- 5	10-28-30	65-78-95	60-70-85	50-60-70	35-43-50	40-45-50	15-20-25
			15-25	Bedrock	—	—	—	—	—	—	—	—	—	—

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Engineering Properties–Washoe County, Nevada, Central Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
540—Mazuma complex, 0 to 4 percent slopes														
Mazuma	60	A	0-10	Loamy fine sand	SM	A-2, A-4	0- 0- 0	0- 0- 0	95-98-100	85-93-100	75-85-95	30-40-50	0-0 -0	NP
			10-60	Stratified gravelly coarse sand to silt loam	SM	A-4	0- 0- 0	0- 0- 0	95-98-100	75-88-100	70-80-90	35-43-50	20-23 -25	NP-3 -5
Mazuma	25	A	0-8	Fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	70-80-90	30-40-50	20-23 -25	NP-3 -5
			8-30	Sandy loam, fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-95-100	30-40-50	20-23 -25	NP-3 -5
			30-60	Stratified gravelly coarse sand to silt loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	75-88-100	70-78-85	50-63-75	25-40-55	20-23 -25	NP-3 -5
542—Mazuma-Ragtown association														
Mazuma	55	B	0-8	Silt loam	ML	A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-95-100	70-75-80	20-23 -25	NP-3 -5
			8-30	Sandy loam, fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-95-100	30-40-50	20-23 -25	NP-3 -5
			30-60	Stratified gravelly coarse sand to silt loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	75-88-100	70-78-85	50-63-75	25-40-55	20-23 -25	NP-3 -5
Ragtown	30	C	0-10	Silty clay loam	CL, ML	A-7	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	95-98-100	80-85-90	40-45 -50	15-18-20
			10-23	Stratified sandy clay loam to silty clay loam	CL	A-6, A-7	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	80-88-95	50-63-75	35-40 -45	15-18-20
			23-60	Stratified silty clay loam to clay	CH, CL, MH	A-7	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-95-100	75-80-85	40-48 -55	20-23-25

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Engineering Properties–Washoe County, Nevada, Central Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
546—Mazuma association														
Mazuma	55	B	0-8	Very fine sandy loam	ML	A-4	0- 0- 0	0- 0- 0	95-98-100	85-93-100	70-80-90	50-58-65	20-23-25	NP-3 -5
			8-60	Stratified gravelly coarse sand to silt loam	SM	A-4	0- 0- 0	0- 0- 0	95-98-100	75-88-100	70-80-90	35-43-50	20-23-25	NP-3 -5
Mazuma	30	A	0-8	Fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	70-80-90	30-40-50	20-23-25	NP-3 -5
			8-30	Sandy loam, fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	30-40-50	20-23-25	NP-3 -5
			30-60	Stratified gravelly coarse sand to silt loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	75-88-100	70-78-85	50-63-75	25-40-55	20-23-25	NP-3 -5
1060—Trocken-Mazuma association														
Trocken	60	B	0-3	Very gravelly sandy loam	GM, SM	A-1	0- 0- 0	0- 5- 10	45-55-65	35-43-50	25-33-40	10-15-20	15-20-25	NP-3 -5
			3-60	Stratified very cobbly loam to extremely gravelly coarse sandy loam	GC, GC-GM, GW-GC	A-1, A-2	0- 0- 5	5- 8- 35	35-53-70	20-35-50	15-28-40	10-15-20	15-20-25	2-5 -10
Mazuma	25	A	0-8	Fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	70-80-90	30-40-50	20-23-25	NP-3 -5
			8-30	Sandy loam, fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	30-40-50	20-23-25	NP-3 -5
			30-60	Stratified gravelly coarse sand to silt loam	ML, SM	A-2, A-4	0- 0- 0	0- 0- 0	75-88-100	70-78-85	50-63-75	25-40-55	20-23-25	NP-3 -5

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Engineering Properties–Washoe County, Nevada, Central Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
1240—Labkey-Mazuma association														
Labkey	55	A	0-4	Gravelly sandy loam	SM	A-1, A-2	0- 0- 0	0- 0- 0	80-90-95	55-65-75	35-45-55	20-28-35	15-18-20	NP-2 -5
			4-14	Gravelly sandy loam, gravelly coarse sandy loam	SM	A-1, A-2	0- 0- 0	0- 0- 0	85-90-90	55-65-70	25-35-45	15-23-30	15-18-20	NP-2 -5
			14-60	Stratified extremely gravelly coarse sand to gravelly sandy loam	SM, SP-SM	A-1	0- 0- 0	0- 0- 0	60-70-80	25-35-45	10-18-25	5-10- 15	0-0 -0	NP
Mazuma	30	A	0-8	Fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	95-98-100	85-93-100	70-78-85	30-40-50	20-23-25	NP-3 -5
			8-60	Stratified gravelly coarse sand to silt loam	SM	A-4	0- 0- 0	0- 0- 0	95-98-100	75-88-100	70-80-90	35-43-50	20-23-25	NP-3 -5
1444—Umberland silty clay loam, ponded														
Umberland	90	D	0-5	Silty clay loam	CL	A-7	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-93-100	40-45-50	20-23-25
			5-60	Silty clay loam, silty clay	CH, CL	A-7	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-93-100	40-48-55	25-28-30

Data Source Information

Soil Survey Area: Pershing County, Nevada, West Part
Survey Area Data: Version 15, Sep 16, 2019

Soil Survey Area: Washoe County, Nevada, Central Part
Survey Area Data: Version 11, Sep 16, 2019

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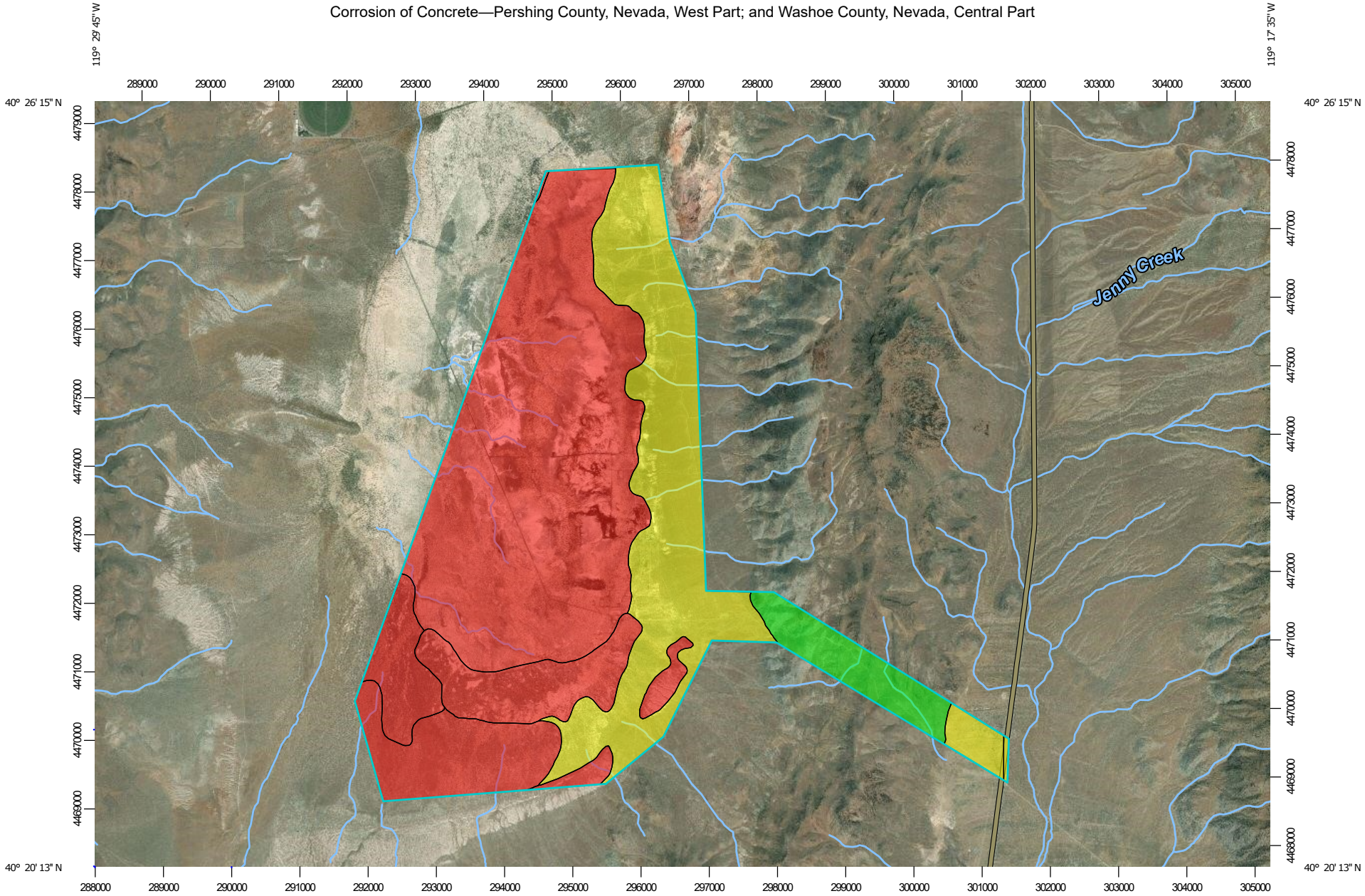

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EXHIBIT P

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pershing County, Nevada, West Part
Survey Area Data: Version 15, Sep 16, 2019

Soil Survey Area: Washoe County, Nevada, Central Part
Survey Area Data: Version 11, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 11, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
653	Labkey-Mazuma association	Moderate	10.5	0.1%
Subtotals for Soil Survey Area			**10.5**	**0.1%**
Totals for Area of Interest			**8,967.3**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
500	Smaug very fine sandy loam, 2 to 8 percent slopes	High	153.3	1.7%
518	Bucklake-Pickup-Wylo association	Low	467.2	5.2%
540	Mazuma complex, 0 to 4 percent slopes	High	366.7	4.1%
542	Mazuma-Ragtown association	High	628.5	7.0%
546	Mazuma association	High	741.0	8.3%
1060	Trocken-Mazuma association	Moderate	2,309.4	25.8%
1240	Labkey-Mazuma association	Moderate	136.8	1.5%
1444	Umberland silty clay loam, ponded	High	4,154.1	46.3%
Subtotals for Soil Survey Area			**8,956.8**	**99.9%**
Totals for Area of Interest			**8,967.3**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

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Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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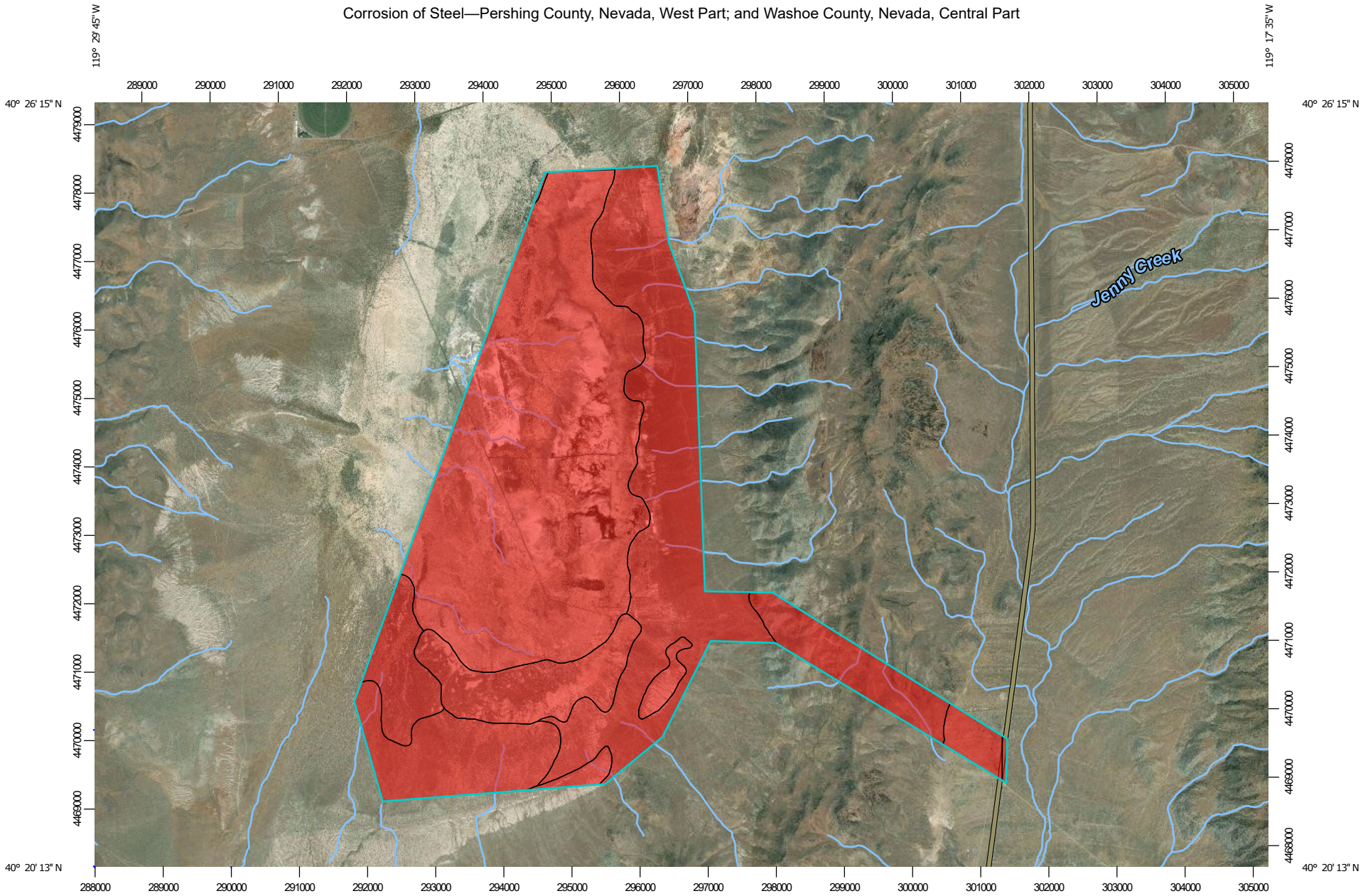

Map Scale: 1:78,700 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 1000 2000 4000 6000

Feet
0 3500 7000 14000 21000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

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MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pershing County, Nevada, West Part
Survey Area Data: Version 15, Sep 16, 2019

Soil Survey Area: Washoe County, Nevada, Central Part
Survey Area Data: Version 11, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 11, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
653	Labkey-Mazuma association	High	10.5	0.1%
Subtotals for Soil Survey Area			**10.5**	**0.1%**
Totals for Area of Interest			**8,967.3**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
500	Smaug very fine sandy loam, 2 to 8 percent slopes	High	153.3	1.7%
518	Bucklake-Pickup-Wylo association	High	467.2	5.2%
540	Mazuma complex, 0 to 4 percent slopes	High	366.7	4.1%
542	Mazuma-Ragtown association	High	628.5	7.0%
546	Mazuma association	High	741.0	8.3%
1060	Trocken-Mazuma association	High	2,309.4	25.8%
1240	Labkey-Mazuma association	High	136.8	1.5%
1444	Umberland silty clay loam, ponded	High	4,154.1	46.3%
Subtotals for Soil Survey Area			**8,956.8**	**99.9%**
Totals for Area of Interest			**8,967.3**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

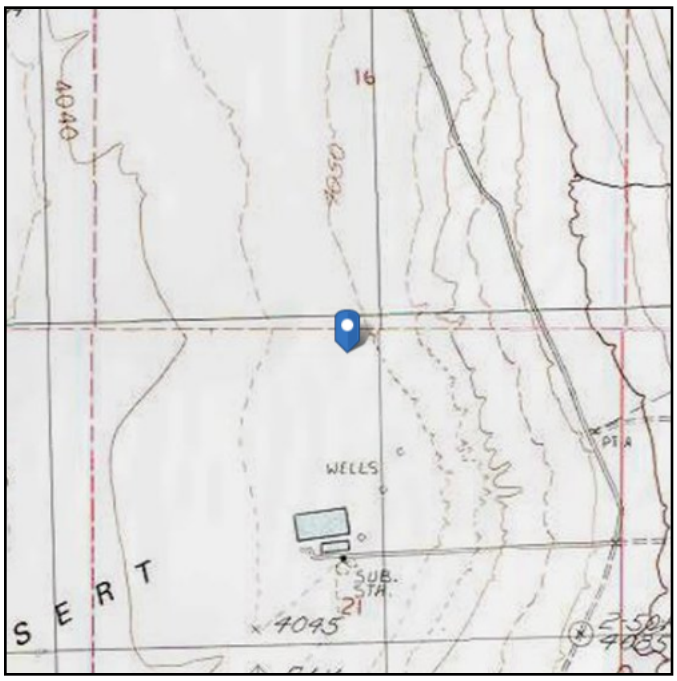
WSUP20-0013
EXHIBIT P

APPENDIX C
PRELIMINARY SEISMIC DESIGN VALUES

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Elevation:**	4051.97 ft (NAVD 88)
Risk Category:	III	**Latitude:**	40.3743
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-119.405



WSUP20-0013
EXHIBIT P

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.938	S_{D1} :	N/A
S_1 :	0.325	T_L :	6
F_a :	1.2	PGA :	0.412
F_v :	N/A	PGA_M :	0.494
S_{MS} :	1.126	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	0.75	C_v :	1.269

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue May 26 2020

Date Source: USGS Seismic Design Maps

WSUP20-0013
EXHIBIT P

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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WSUP20-0013
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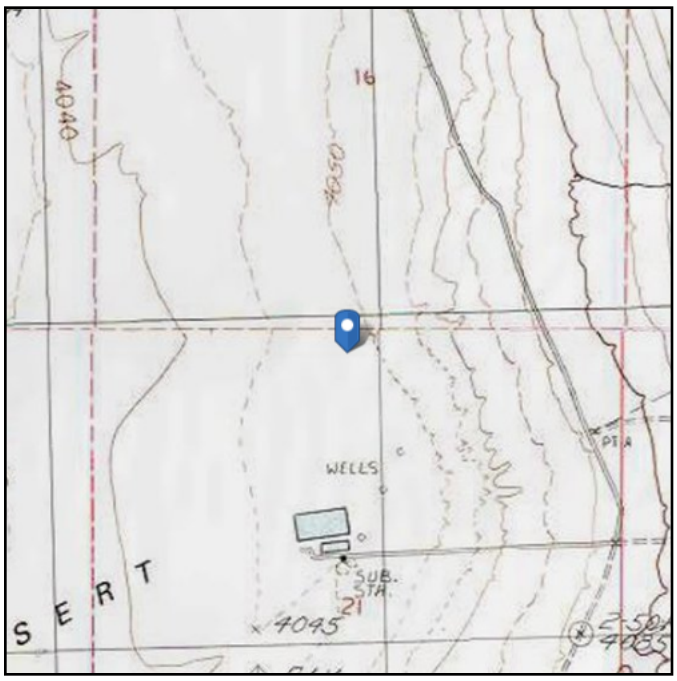
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Elevation:**	4051.97 ft (NAVD 88)
Risk Category:	IV	**Latitude:**	40.3743
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-119.405



WSUP20-0013
EXHIBIT P

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.938	S_{D1} :	N/A
S_1 :	0.325	T_L :	6
F_a :	1.2	PGA :	0.412
F_v :	N/A	PGA_M :	0.494
S_{MS} :	1.126	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1.5
S_{DS} :	0.75	C_v :	1.269

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue May 26 2020

Date Source: USGS Seismic Design Maps

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In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT
SPECIAL USE PERMIT
TITLE SHEET

OWNER/DEVELOPER:

ORNI 36 LLC
6140 PLUMAS ST.
RENO, NV 89519

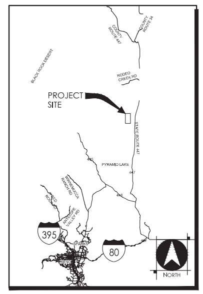
BASIS OF BEARING:

NEVADA STATE PLANE COORDINATE SYSTEM, NEVADA WEST ZONE 2703, NORTH AMERICAN DATUM OF 1983 (NAD 1983 CONUS MOLODENSKY), AS DETERMINED USING REAL TIME KINEMATIC (RTK) GPS OBSERVATIONS WITH CALL DIMENSIONS SHOWN ARE GROUND DISTANCES. GRID TO GROUND COMBINED FACTOR = 1.0002288552

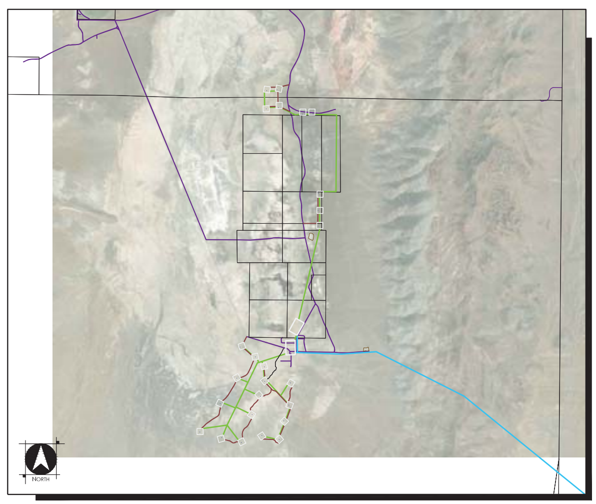
BASIS OF ELEVATION:

U.S. GEOLOGICAL SURVEY, 2017, 1/3RD ARC-SECOND DIGITAL ELEVATION MODELS (DEMS) - USGS NATIONAL MAP 3DEP DOWNLOADABLE DATA COLLECTION: U.S. GEOLOGICAL SURVEY.

THIS IS A TILED COLLECTION OF THE 3D ELEVATION PROGRAM (3DEP) AND IS 1/3 ARC-SECOND (APPROXIMATELY 10 M) RESOLUTION.THE 3DEP DATA HOLDINGS SERVE AS THE ELEVATION LAYER OF THE NATIONAL MAP, AND PROVIDE FOUNDATIONAL ELEVATION INFORMATION FOR EARTH SCIENCE STUDIES AND MAPPING APPLICATIONS IN THE UNITED STATES. SCIENTISTS AND RESOURCE MANAGERS USE 3DEP DATA FOR HYDROLOGIC MODELING, RESOURCE MONITORING, MAPPING AND VISUALIZATION, AND MANY OTHER APPLICATIONS. THE ELEVATIONS IN THIS DEM REPRESENT THE TOPOGRAPHIC BARE-EARTH SURFACE. THE SEAMLESS 1/3 ARC-SECOND DEM LAYERS ARE DERIVED FROM DIVERSE SOURCE DATA THAT ARE PROCESSED TO A COMMON COORDINATE SYSTEM AND UNIT OF VERTICAL MEASURE. THESE DATA ARE DISTRIBUTED IN GEOGRAPHIC COORDINATES IN UNITS OF DECIMAL DEGREES, AND IN CONFORMANCE WITH THE NORTH AMERICAN DATUM OF 1983 (NAD 83). ALL ELEVATION VALUES ARE IN METERS AND, OVER THE CONTINENTAL UNITED STATES, ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). THE SEAMLESS 1/3 ARC-SECOND DEM LAYER PROVIDES COVERAGE OF THE CONTERMINOUS UNITED STATES, HAWAII, PUERTO RICO, OTHER TERRITORIAL ISLANDS, AND IN LIMITED AREAS OF ALASKA. THE SEAMLESS 1/3 ARC-SECOND DEM IS AVAILABLE AS PRE-STAGED PRODUCTS TILED IN 1 DEGREE BLOCKS IN ERDAS .IMG, ESRI ARC-GRID, AND GRID FLOAT FORMATS. THE SEAMLESS 1/3 ARC-SECOND DEM LAYER IS UPDATED CONTINUALLY AS NEW DATA BECOME AVAILABLE. OTHER 3DEP PRODUCTS ARE NATIONALLY SEAMLESS DEMS IN RESOLUTIONS OF 1, AND 2 ARC SECONDS. THESE SEAMLESS DEMS WERE REFERRED TO AS THE NATIONAL ELEVATION DATASET (NED) FROM ABOUT 2000 THROUGH 2015 AT WHICH TIME THEY BECAME THE SEAMLESS DEM LAYERS UNDER THE 3DEP PROGRAM AND THE NED NAME AND SYSTEM WERE RETIRED. OTHER 3DEP PRODUCTS INCLUDE ONE-METER DEMS PRODUCED EXCLUSIVELY FROM HIGH RESOLUTION LIGHT DETECTION AND RANGING (LIDAR) SOURCE DATA AND FIVE-METER DEMS IN ALASKA AS WELL AS VARIOUS SOURCE DATASETS INCLUDING THE LIDAR POINT CLOUD AND INTERFEROMETRIC SYNTHETIC APERTURE RADAR (IFSAR) DIGITAL SURFACE MODELS AND INTENSITY IMAGES. ALL 3DEP PRODUCTS ARE PUBLIC DOMAIN.



VICINITY MAP
NOT TO SCALE



SITE PLAN
NOT TO SCALE

SITE INFORMATION:

SITE PLAN STATISTICS
SITE AREA: 20,407.12 AC
DISTURBED AREA: 189.9 AC

PROJECT LOCATION
SAN EMIDIO UNIT AREA IN ALL OR PORTIONS OF SECTIONS 19-22 AND 27-34, TOWNSHIP 30 NORTH, RANGE 23 EAST; SECTIONS 3-10, 15-22, AND 27-34, TOWNSHIP 29 NORTH, RANGE 23 EAST (T29N, R23E), MOUNT DIABLO BASELINE AND MERIDIAN (MDB&M).

ENGINEERS STATEMENT:

I, TODD GAMMILL, DO HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND WAS COMPLETED ON THE 15th DAY OF JUNE, 2020.

TODD GAMMILL, P.E. #13693

SHEET INDEX

SHT No.	DWG ID	DRAWING DESCRIPTION
1	T-1	TITLE SHEET
2	S-1	PRELIMINARY SITE PLAN
3	G-1	PRELIMINARY GRADING PLAN
4	G-2	PRELIMINARY GRADING PLAN
5	G-3	PRELIMINARY GRADING PLAN
6	G-4	PRELIMINARY GRADING PLAN
7	G-5	PRELIMINARY GRADING PLAN
8	D-1	DETAIL SHEET
9	D-2	DETAIL SHEET

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
TITLE SHEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

1707.005 JUNE 2020

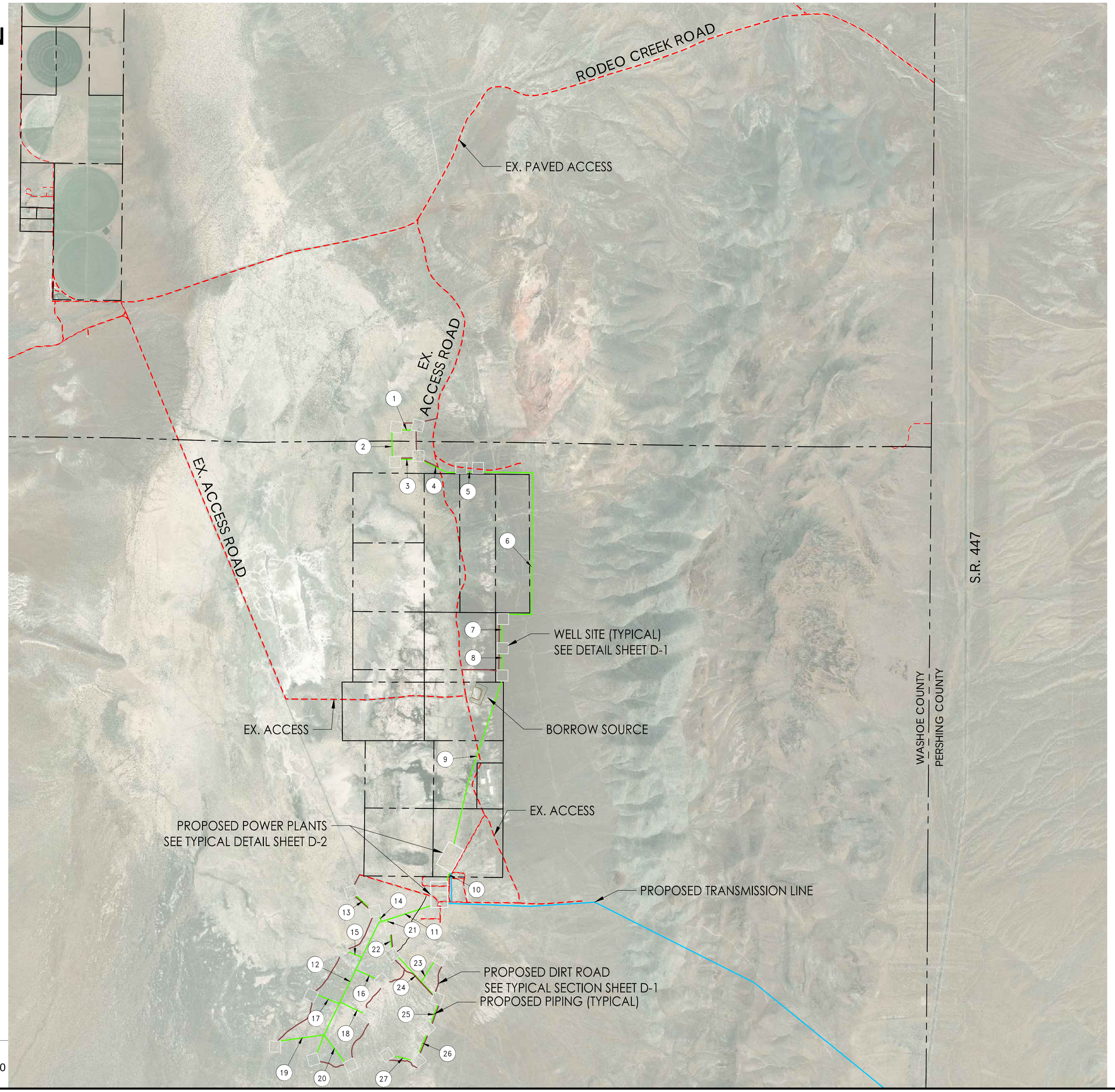
SHEET T-1 OF 9

WSUP20-0013
EXHIBIT P

J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_OA\Planning\Dwg\C01_SUP_NVG_T01.dwg 6/15/2020 11:51 AM Todd Gammill

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT
SITE & UTILITY PLAN



UTILITY NOTES

1. 380 LF WATER PIPE
2. 955 LF WATER PIPE
3. 474 LF WATER PIPE
4. 1324 LF WATER PIPE
5. 210 LF WATER PIPE
6. 7796 LF WATER PIPE
7. 700 LF WATER PIPE
8. 625 LF WATER PIPE
9. 6562 LF WATER PIPE
10. 400 LF WATER PIPE
11. 2107 LF WATER PIPE
12. 5578 LF WATER PIPE
13. 633 LF WATER PIPE
14. 232 LF WATER PIPE
15. 583 LF WATER PIPE
16. 831 LF WATER PIPE
17. 911 LF WATER PIPE
18. 1000 LF WATER PIPE
19. 1699 LF WATER PIPE
20. 1317 LF WATER PIPE
21. 151 LF WATER PIPE
22. 541 LF WATER PIPE
23. 918 LF WATER PIPE
24. 1973 LF WATER PIPE
25. 753 LF WATER PIPE
26. 758 LF WATER PIPE
27. 646 LF WATER PIPE

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH

0 2000 1000 4000

USUP20013
EXHIBIT P

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
SITE & UTILITY PLAN

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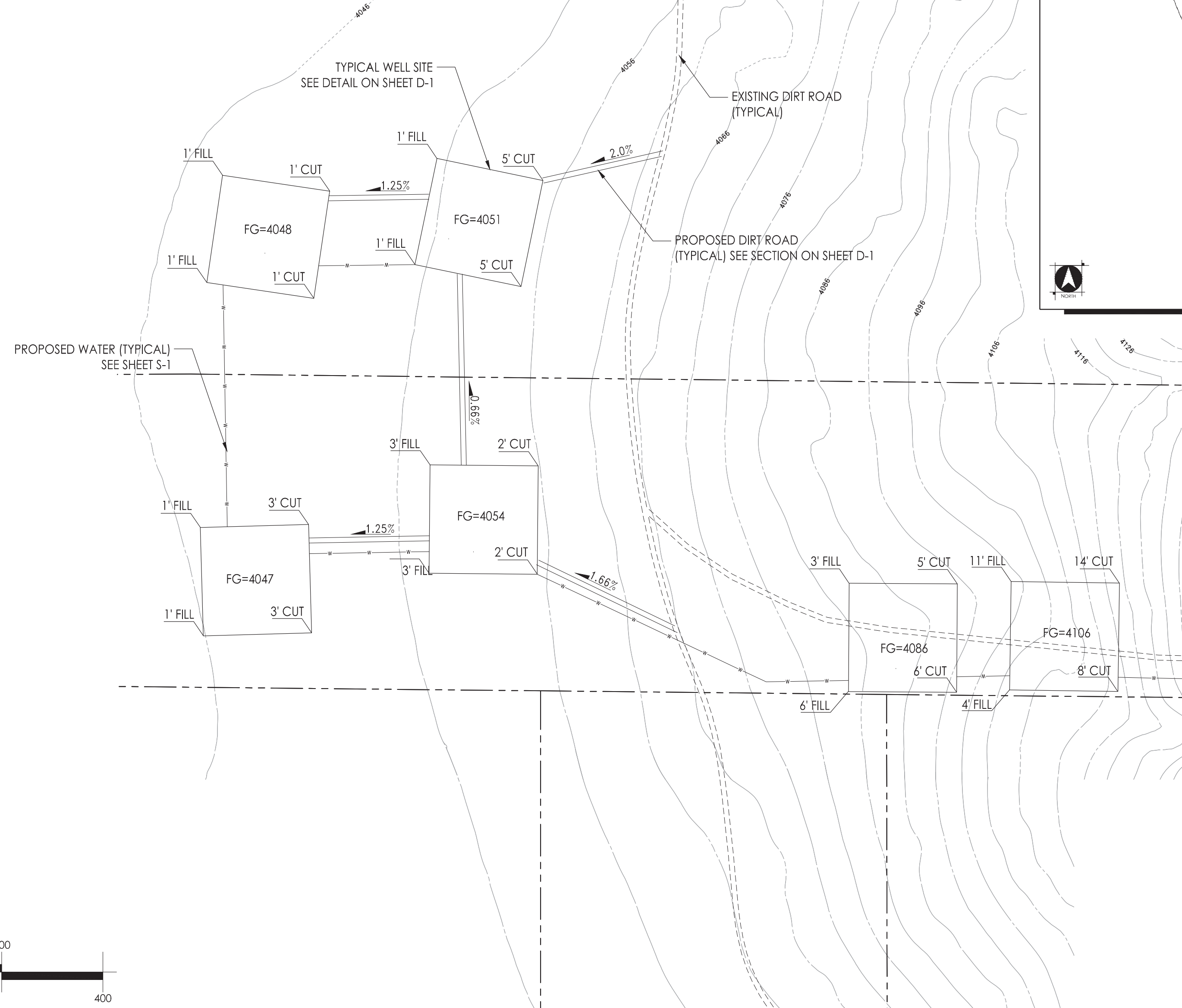
Fax 775.823.4066

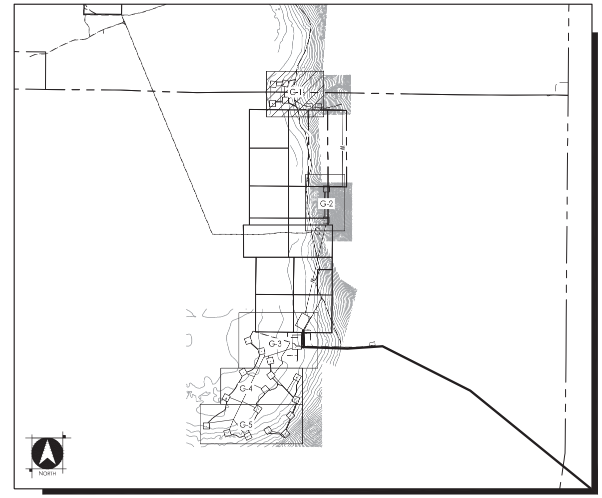
1707.005 JUNE 2020

SHEET **S-1** OF **9**

a:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_OA\Planning\Dwg\C02_SUP_NVG_S01.dwg 7/2/2020 8:47 AM Todd Gimmill

NORTH VALLEY GEOTHERMAL DEVELOPMENT
SPECIAL USE PERMIT
GRADING PLAN





KEY MAP
NOT TO SCALE

0 100 200 400

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

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SHEET **G-1** OF **9**

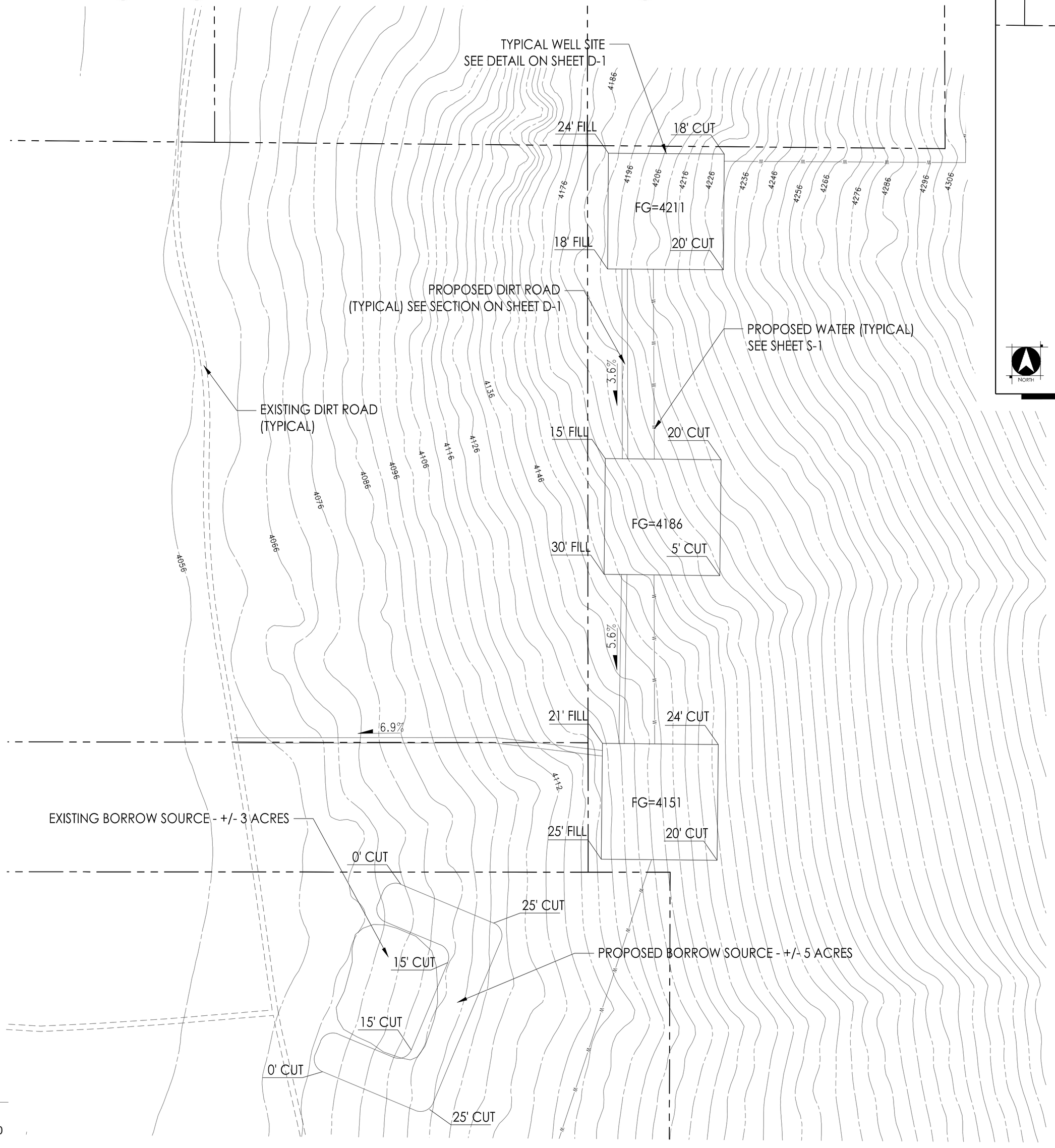
J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_04\Planning\Dwg\C03_SUP_NVG_G01.dwg 6/15/2020 11:52 AM Todd Gammill

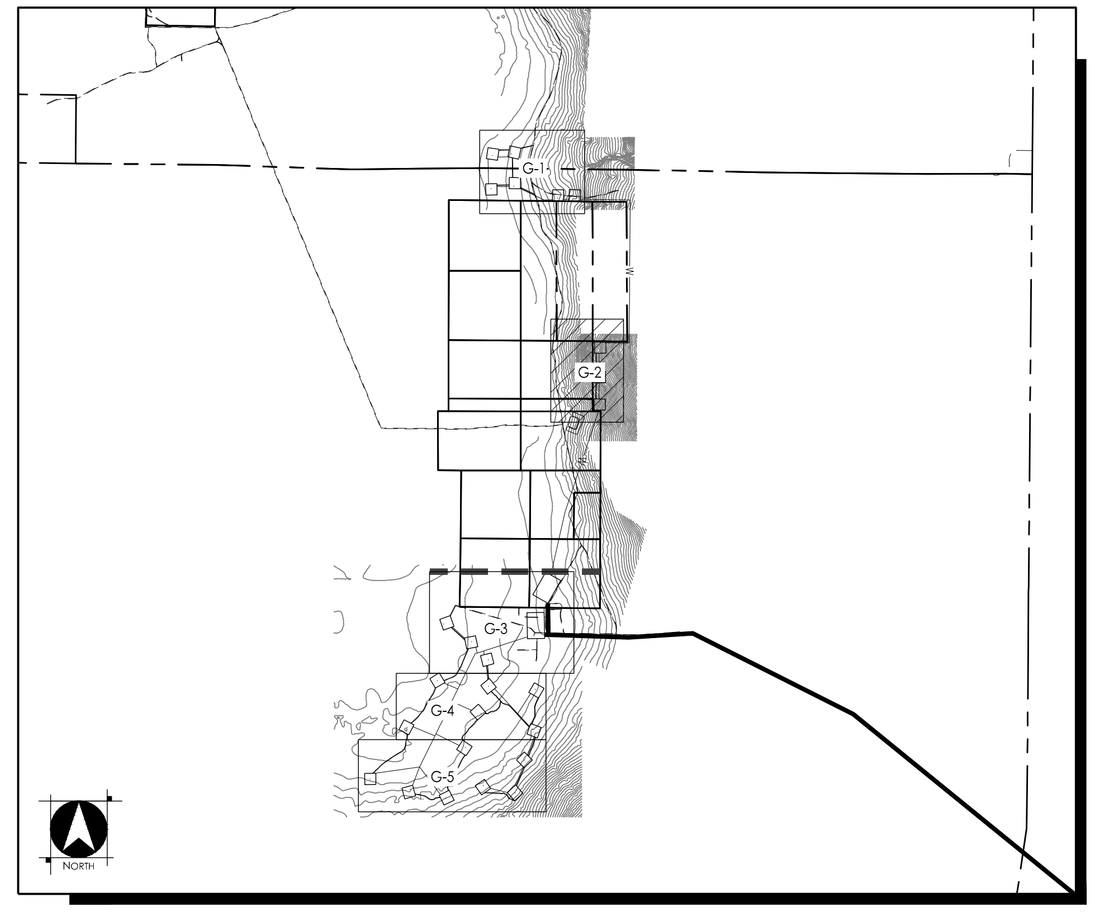
WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN





KEY MAP
NOT TO SCALE

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH VALLEY GEOTHERMAL DEVELOPMENT

GRADING PLAN

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JUNE 2020

SHEET **G-2** OF **9**

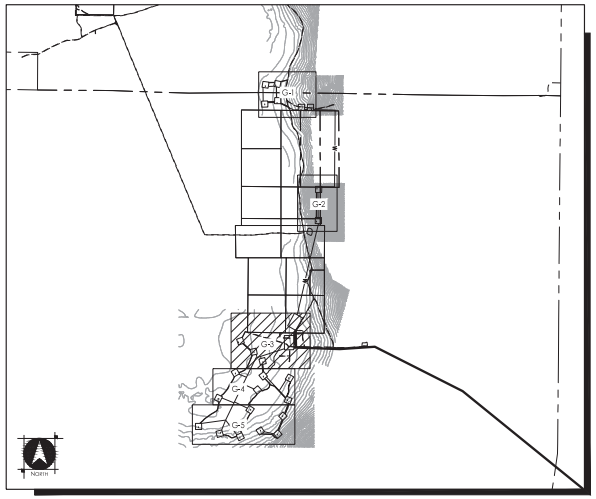
WSUP20-0013
EXHIBIT P

J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_DA\Planning\Dwg\C04_SUP_NVG_G02.dwg 7/2/2020 9:01 AM Todd Gemmill

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN



KEY MAP
NOT TO SCALE

0' FILL
3' CUT
FG=4053
2' FILL
4046
PROPOSED POWER PLANT SITES
SEE TYPICAL DETAIL SHEET D-2
0' CUT
1' FILL
1' CUT
0.30%
0' CUT
PROPOSED DIRT ROAD
(TYPICAL) SEE SECTION ON SHEET D-1
1' FILL
FG=4039
1' CUT
0' FILL
0.40%
EXISTING DIRT ROAD
(TYPICAL)
FG=4051
1' CUT
TYPICAL WELL SITE
SEE DETAIL ON SHEET D-1
0' FILL
FG=4041
1' CUT
0' FILL
1' FILL
PROPOSED TRANSMISSION LINE
SEE SHEET S-1
4056
1' CUT
PROPOSED WATER (TYPICAL)
SEE SHEET S-1
1' FILL
FG=4043
1' CUT
1' FILL

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

0 200
100 400
NORTH

WSUP20-0013
EXHIBIT P

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
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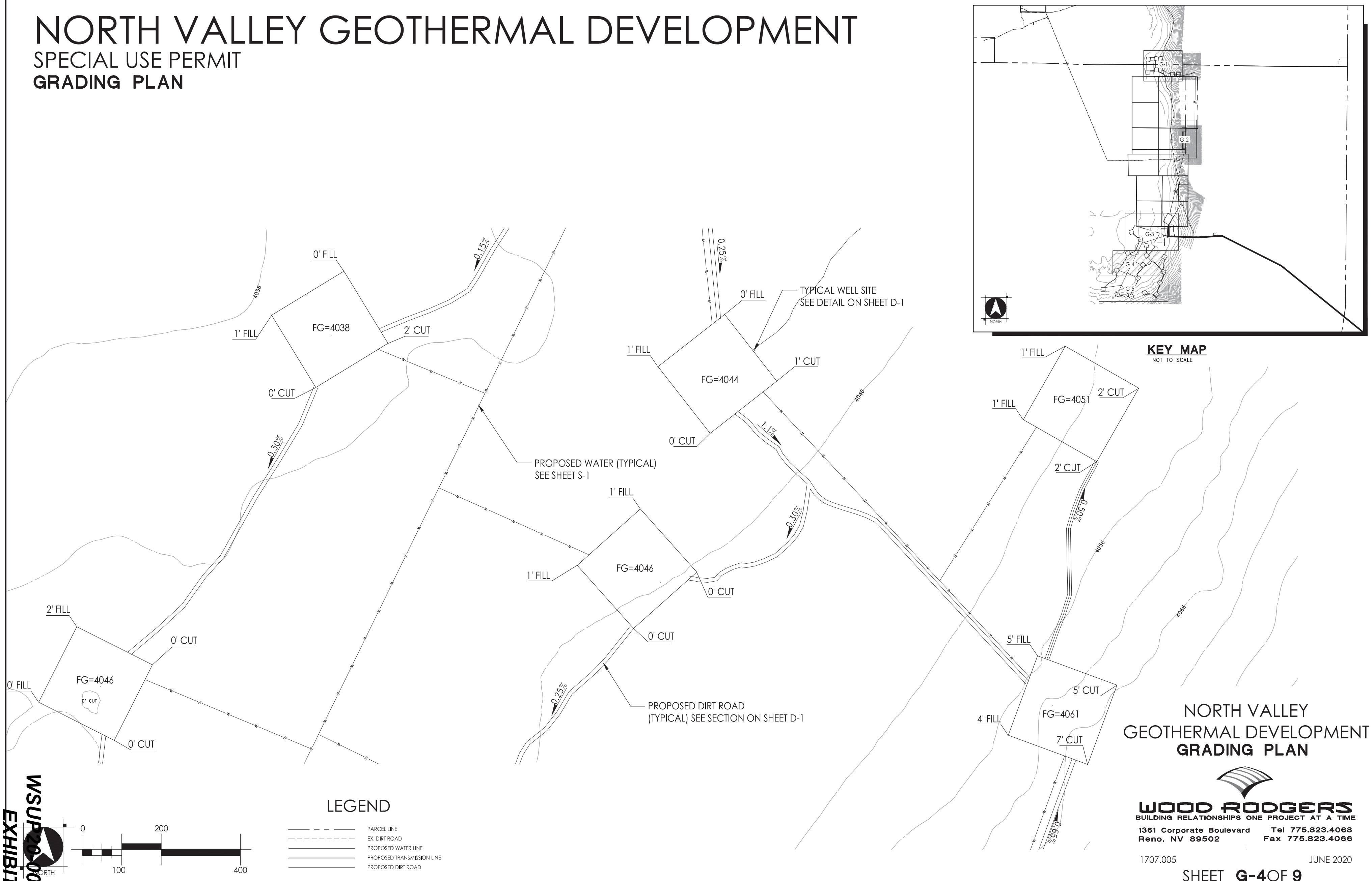
SHEET **G-3** OF **9**

z:\Jobs\1707_Starwood Hits Geothermal\North_Valley_Geothermal_GA\Planning\Dwg\GDS_SUP_JMS_G03.dwg 6/19/2020 11:52 AM Todd Gemmill

NORTH VALLEY GEOTHERMAL DEVELOPMENT
SPECIAL USE PERMIT
GRADING PLAN



NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

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JUNE 2020

SHEET **G-4** OF **9**

J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_04\Planning\Dwg\C06_SUP_NVG_G04.dwg 6/15/2020 11:52 AM Todd Gammill

WSUP20-0013
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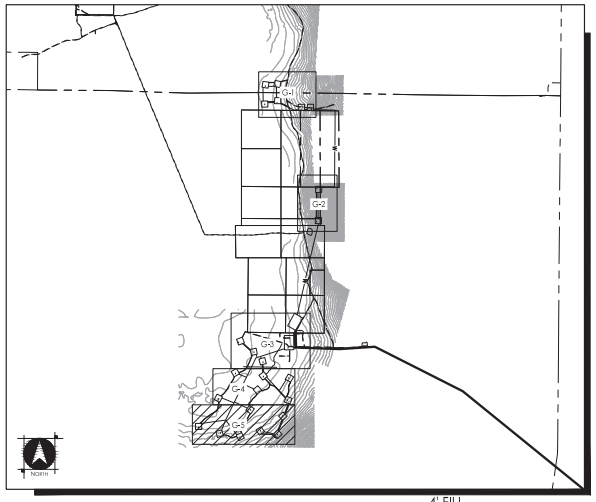
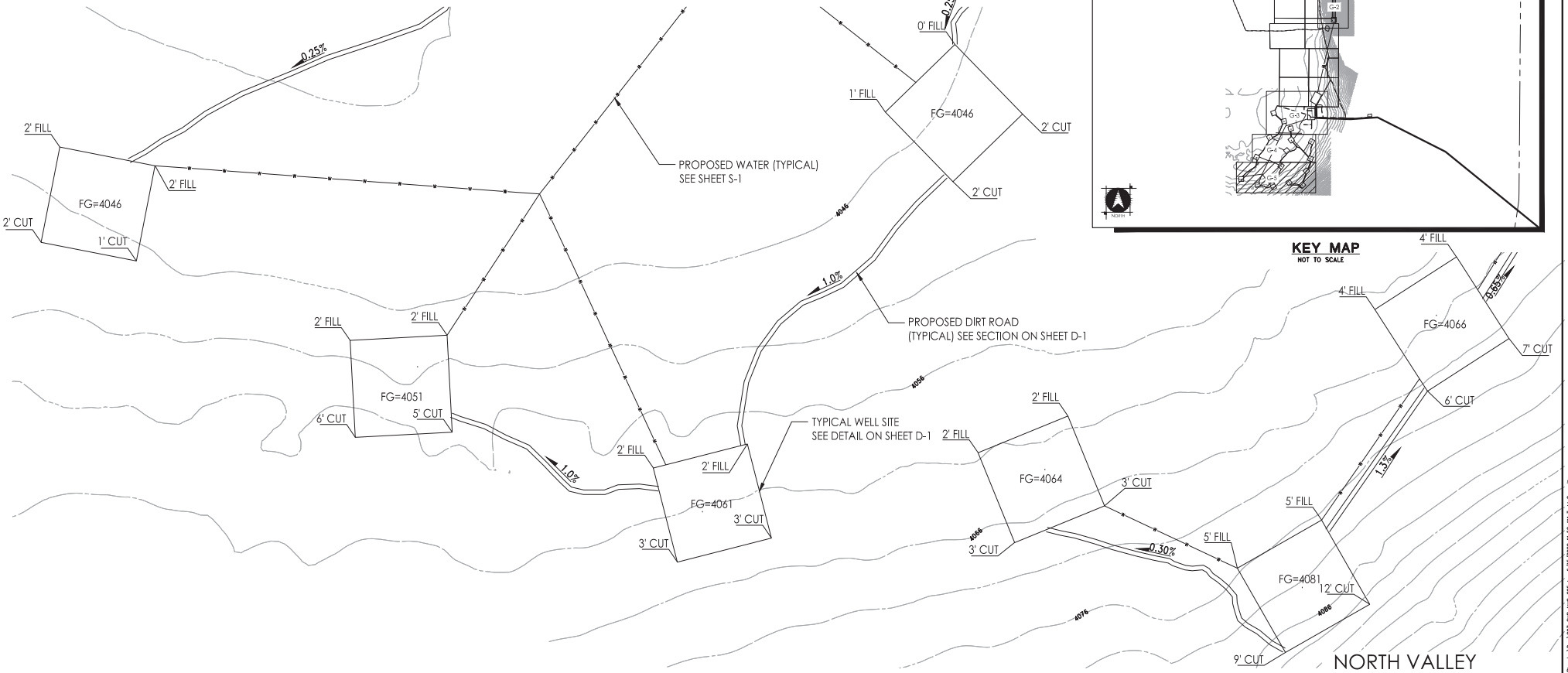
NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN



KEY MAP
NOT TO SCALE



NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

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1707.005 JUNE 2020

SHEET **G-5** OF **9**

LEGEND

PARCEL LINE
EX. DIRT ROAD
PROPOSED WATER LINE
PROPOSED TRANSMISSION LINE
PROPOSED DIRT ROAD

0 200 100 400

WSUP-20-0013
EXHIBIT P

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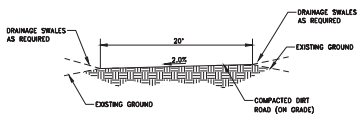
NORTH VALLEY GEOTHERMAL DEVELOPMENT

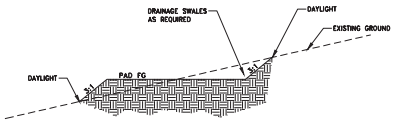
SPECIAL USE PERMIT

DETAIL SHEET



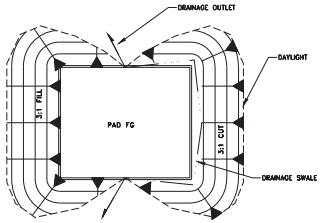
TYPICAL ROAD SECTION

NOT TO SCALE



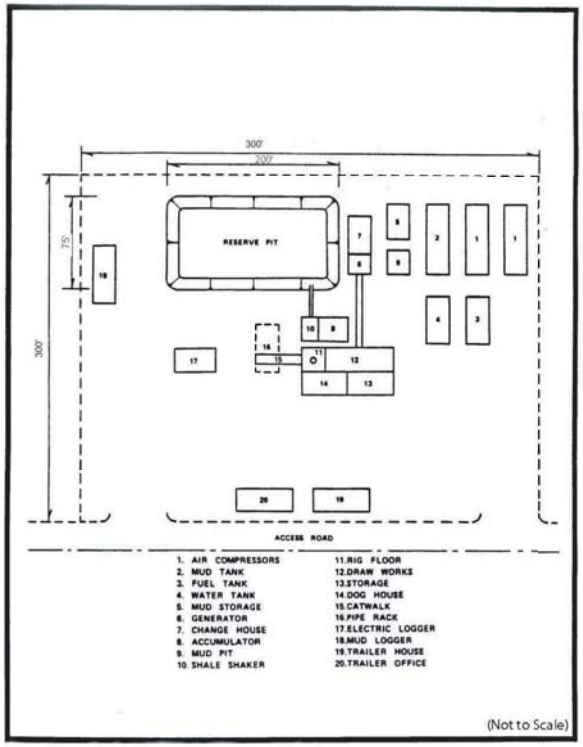
TYPICAL PAD GRADING SECTION

NOT TO SCALE



TYPICAL PAD GRADING PLAN

NOT TO SCALE



TYPICAL GEOTECHNICAL WELL PAD LAYOUT

NOT TO SCALE

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
DETAIL SHEET

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Tel 775.823.4068
Fax 775.823.4066

1707.005 JUNE 2020

WSUP20-0013
EXHIBIT P

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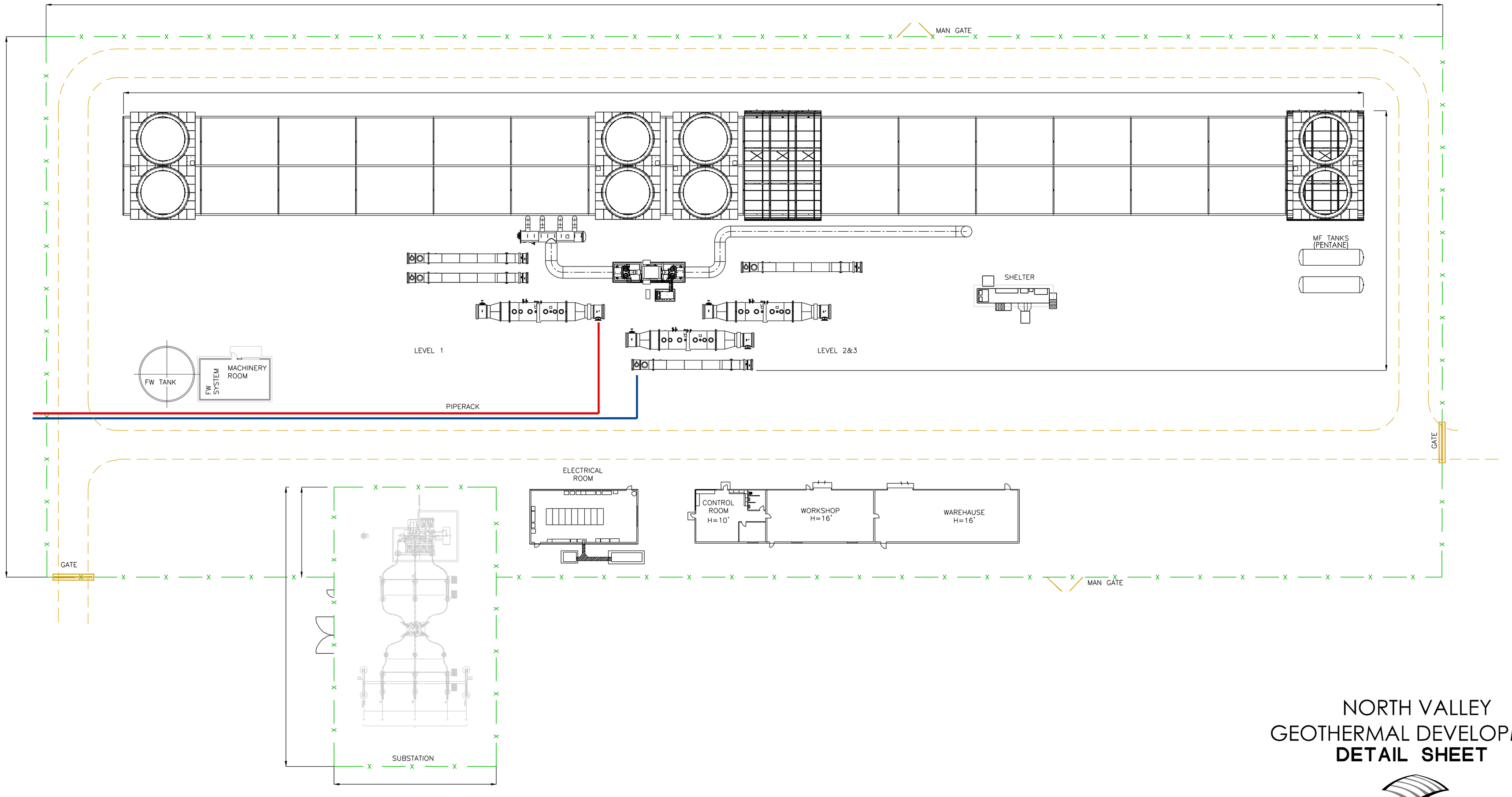
NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

DETAIL SHEET



TYPICAL POWER PLANT
(NTS)

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
DETAIL SHEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

1707.005

JUNE 2020

WSUP20-0013
EXHIBIT P

a:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_OA\Planning\Dwg\C09_SUP_NVG_D02.dwg 6/30/2020 3:00 PM Todd Gemmill

Cahalane, Daniel

From: Stacie Huggins <shuggins@WoodRodgers.com>
Sent: Wednesday, August 05, 2020 8:55 AM
To: Cahalane, Daniel
Cc: Benjamin Orcutt
Subject: RE: WSUP20-0013 Ormat Geothermal - Response to Comments
Attachments: Figure 3 - Substation Plan View.pdf

[**NOTICE:** This message originated outside of Washoe County -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

Dan- thanks again for the follow up call earlier this week...there are a lot of moving parts with this project so its good to keep an open dialogue when there are questions. Please note that I have provided below responses (in ***red***) to your comments below in order of receiving them so you'll need to scroll to the bottom.

I believe we have addressed everything you've asked for but if you have any additional questions or need anything else, please let us know.

Thanks!

Stacie Huggins
Wood Rodgers, Inc.
775.823.5258 Direct
775.250.8213 Mobile

| **Fully Functional** in a Remote Workspace Environment |

From: Cahalane, Daniel <DCahalane@washoecounty.us>
Sent: Monday, August 03, 2020 11:04 AM
To: Stacie Huggins <shuggins@WoodRodgers.com>
Cc: Lloyd, Trevor <TLloyd@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

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Hi Stacie,

Vahid is unavailable at 2pm this afternoon. He'll be available all morning tomorrow and all day Wednesday and Thursday. **The water rights issue is your biggest hold up.** ***[SH] Ormat representatives spoke with Vahid on Tuesday, August 4th and our understanding is that Vahid will update his letter and send to you.***

We can discuss the aggregate pit issue this afternoon.

WSUP20-0013
EXHIBIT P

Personally, I don't see much benefit in discussing it. I've got to be able to go up and justify how this application meets code to the Planning Commission (and BCC). As it is currently described, an educated layperson would look at the pit as an aggregate pit because you are taking 100,000 cy of material out of the borrow pit, you are expanding it by 5 acres, and you have cut slopes of 15ft and 25ft within the pit. You also state that you'll store the topsoil/ the pads, which will be cleared only when scheduled to be drilled.

But that does not need to hold up this Project of Regional Significance/hazardous materials/use/major grading permit SUP. **I am more than happy to condition getting an SUP for the aggregate facility in this application**. Then you can deal with the aggregate facility permit as a separate SUP (at the BOA not PC, without any BCC involvement, with a 65 day turnaround) and still have both applications completed roughly at the same time (December BOA/Regional Governing Board, BOA application intake October 8).***[SH]*** ***we will submit a completely separate SUP for the pit at a later date.***

The other alternative would be to amend this application to make the borrow pit into something less like an aggregate facility, which would necessitate an application resubmittal. That would restart the 5-6 month application timeline.

But, we can discuss this issue later today at your convenience.

Regards,

Dan Cahalane
Planner|Community Services Department- Planning & Building Division
dcahalane@washoecounty.us| Office: 775.328.3628 | Fax: 775.328.6133
Visit us first online: www.washoecounty.us/csd
For Planning call (775) 328-6100 | Email: Planning@washoecounty.us

1001 E. Ninth St., Bldg A., Reno, NV 89512

Connect with us: cMail | Twitter | Facebook | www.washoecounty.us

From: Cahalane, Daniel <DCahalane@washoecounty.us>
Sent: Friday, July 31, 2020 8:55 AM
To: Stacie Huggins <shuggins@WoodRodgers.com>
Cc: Lloyd, Trevor <TLloyd@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

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Hi Stacie,

Thank you for responding. I left a voicemail with Andy (as he is the contact on the application***). Please respond to Vahid Behmaram (Behmaram, Vahid VBehmaram@washoecounty.us) regarding his water rights questions as soon as possible. As it stands right now, you are looking at a denial due to the lack of clarification regarding already allocated water rights.***

My staff report is due to management next Thursday. I would like to try to set a site visit at the site (in order to view existing conditions sometime before then). I will be unavailable any time next Tuesday, but can figure out how make it work if necessary.

I can condition the requirement for the aggregate pit in my staff report. That will keep this timeline moving forwards while allowing the issue to be resolved. I can write the condition such to provide wiggle room if the borrow pit ends up not being an aggregate pit. ***[SH]*** **We will submit a completely separate SUP for the pit at a later date.**

I'd also appreciate some clarification on the size of the substations required to move the electricity from the plants to the grid. I need this to capture all of the reasons for why this is considered a project of regional significance. ***[SH]*** ***The main component of the on-site substation is the generator step-up transformer (GST), which steps up the low voltage output from the energy converter (generator) to the voltage of the transmission line (120kV). Due to the potential variation in temperature and pressures of the yet-to-be-drilled geothermal wells that would serve the plant, the final size of the GST is undetermined until successful wells have been drilled and tested.***

For a typical 24MW power plant, which is what we are proposing for North Valley, the electrical power generated would be 12.47kV, which would pass through the GST, stepping up the voltage to 120kV for transmission. Other than the GST, a 12.47 kV circuit breaker to protect the generators, potential and current transformers for metering and system protection, and a circuit breaker to protect the substation would are additional components of the on-site substation. Further, an unmanned control building containing instrumentation and telecommunications equipment would be located within the substation fence. I've attached the layout (see Substation pfd) of what this would look like, with overall on-site substation footprint being 200' x 150' and surrounded by a chain link fence.

If you would like to delay the application in order to resolve the water rights issues or aggregate pit issues, please send me an email requesting to delay the application.

Regards,

From: Stacie Huggins <shuggins@WoodRodgers.com>
Sent: Friday, July 31, 2020 8:41 AM
To: Cahalane, Daniel <DCahalane@washoecounty.us>; Andy Durling <adurling@WoodRodgers.com>
Cc: Lloyd, Trevor <TLloyd@washoecounty.us>
Subject: RE: WSUP20-0013 Ormat Geothermal

[**NOTICE:** This message originated outside of Washoe County -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

Good morning Dan – I'm not sure who you left a voicemail for but I wanted to respond to your email.

In terms of a site visit, we had offered to arrange a site visit of the existing Steamboat facility so you can see how these plants operate but given your request, I'm assuming you want to see the proposed site, not the Steamboat facility; is that correct? In either case, we can definitely coordinate a tour with Ormat…perhaps its best if you provide me with a couple dates/times that work for you and we'll coordinate with Ormat.

In terms of your other questions, Andy and I are doing a little more research on those and will need to follow up. It seems there is a disconnect about the purpose of the pit and the material coming from the pit so we want to be sure we're clear on our side before we have additional discussion about this.

Thanks.

Stacie Huggins
Wood Rodgers, Inc.
775.823.5258 Direct

WSUP20-0013
EXHIBIT P

775.250.8213 Mobile

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From: Cahalane, Daniel <DCahalane@washoecounty.us>
Sent: Tuesday, July 28, 2020 9:15 AM
To: Andy Durling <adurling@WoodRodgers.com>; Stacie Huggins <shuggins@WoodRodgers.com>
Cc: Lloyd, Trevor <TLloyd@washoecounty.us>
Subject: WSUP20-0013 Ormat Geothermal

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Hi Andy and Stacie,

I just left a message. I figured it would be good to send an email as well. I have a few of things that I'd like to discuss with you.

1. I'd like to set up a site visit some time in the next two weeks to look at the area of interest.
2. There is an issue regarding the "borrow pit" on the site. The grading plans (15-25ft cuts) and the description (approximately 100,000cy of material on a project with 300,000 cy of cut/fill) clearly show that this is an aggregate pit. This will require a Special Use Permit for a Temporary Restricted Market Aggregate Pit in accordance with Article 332 (this will require a mining plan). You can approach this issue a couple of different ways:
    a. Delay the current SUP and resubmit with the required plans.
    b. Continue the current SUP, anticipate that the "borrow pit" will be conditioned to require an SUP that you can submit at a later date. This would be a normal SUP (approximately 65 days).
3. The grading plans as currently submitted show cuts and fills in excess of 10ft for a number of well pads. This is not permissible within article 438. Expect that you will be required to abide by all code standards found in article 438 including the terracing of these cut and fill slopes. ***[SH]*** ***We are requesting a waiver to the standards for providing terracing for cuts exceeding 10 feet as noted in Article 438. This request is supported by the fact that if cuts are greater than 10 feet, they will not be visible from public rights-of-way, they will be located outside of the required yard setback and they will be revegetated.***

Please reach out to me either via cell phone (203-417-6543) or email if you would like to discuss further as I am in and out of the office.

Regards,

Dan Cahalane
Planner|Community Services Department- Planning & Building Division
dcahalane@washoecounty.us| Office: 775.328.3628 | Fax: 775.328.6133
Visit us first online: www.washoecounty.us/csd
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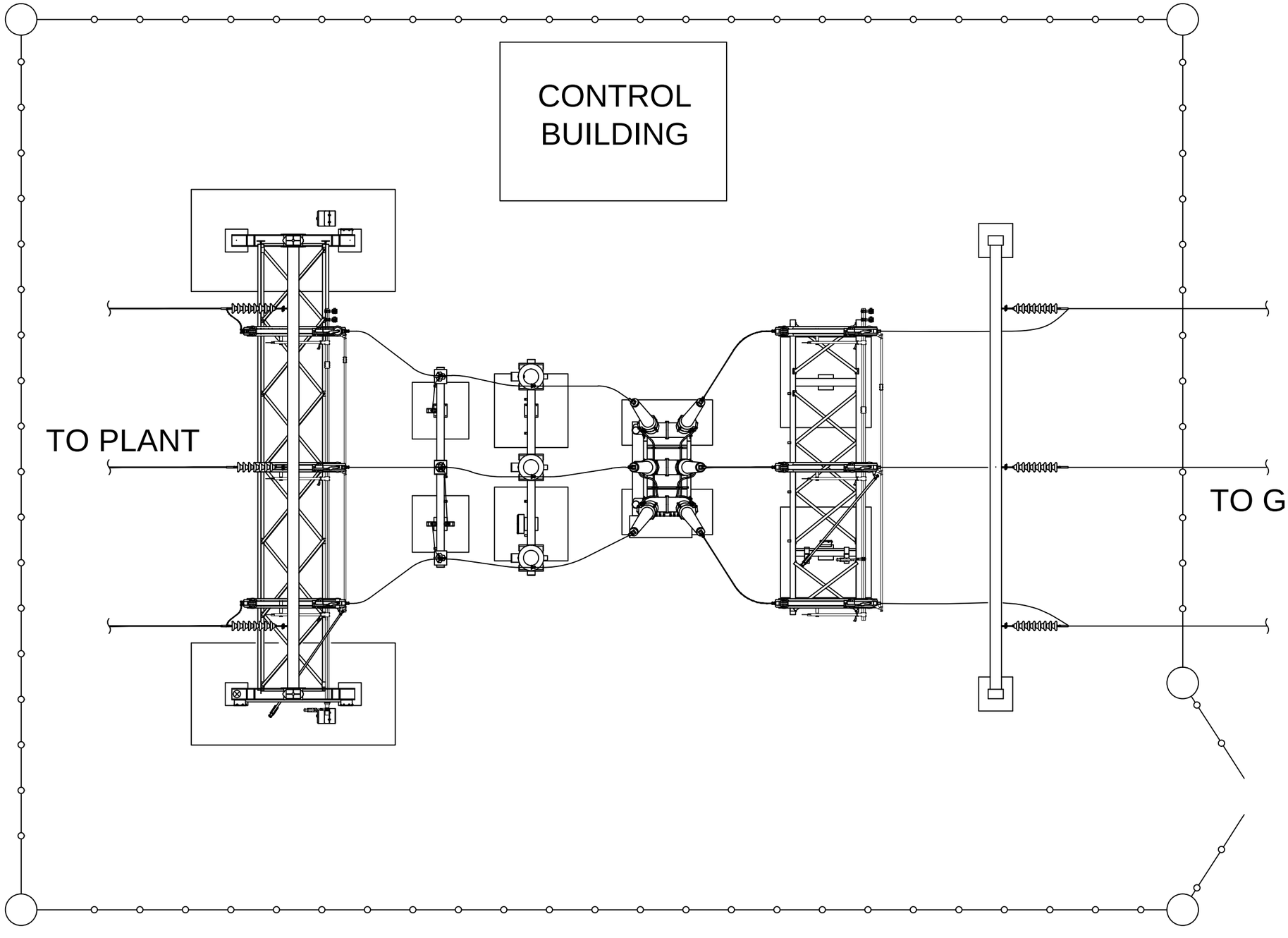
WSUP20-0013
EXHIBIT P



ENGINEER:	JIM BENGOCHEA
PHONE NUMBER:	(775) 336-1302
PROJECT NUMBER:	NV_01
PREPARED BY:	KLD
CHECKED:	JMB

TRISAGE CONSULTING
5418 Longley Lane, Suite A
Reno, NV 89511
Ph. (775) 336-1302
Fax: (775) 336-1306

Rev.	Date	Description	By
1	4/14/2017	ISSUED FOR POD	KLD

ORMAT®

ORMAT NORTH VALLEY 120KV LINE
PROPOSED SUBSTATION PLAN VIEW
FIGURE 3

SHEET
1 OF 1

WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

TITLE SHEET

OWNER/DEVELOPER:

ORNI 36 LLC
6140 PLUMAS ST.
RENO, NV 89519

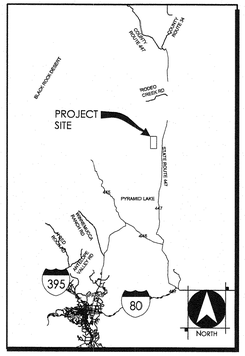
BASIS OF BEARING:

NEVADA STATE PLANE COORDINATE SYSTEM, NEVADA WEST ZONE 2703, NORTH AMERICAN DATUM OF 1983 (NAD 1983 CONUS MOLODENSKY), AS DETERMINED USING REAL TIME KINEMATIC (RTK) GPS OBSERVATIONS WITH CALL DIMENSIONS SHOWN ARE GROUND DISTANCES. GRID TO GROUND COMBINED FACTOR = 1.0002288552

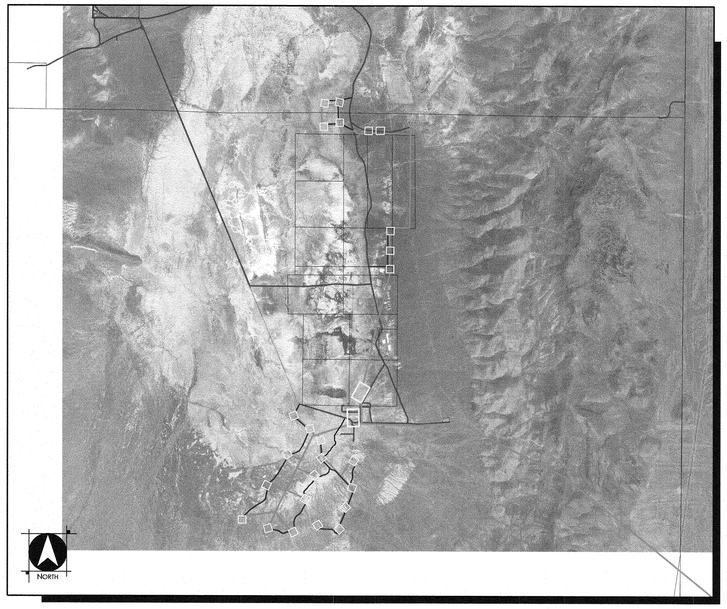
BASIS OF ELEVATION:

U.S. GEOLOGICAL SURVEY, 2017. 1/3RD ARC-SECOND DIGITAL ELEVATION MODELS (DEMS) - USGS NATIONAL MAP 3DEP DOWNLOADABLE DATA COLLECTION: U.S. GEOLOGICAL SURVEY.

THIS IS A TILED COLLECTION OF THE 3D ELEVATION PROGRAM (3DEP) AND IS 1/3 ARC-SECOND (APPROXIMATELY 10 M) RESOLUTION.THE 3DEP DATA HOLDINGS SERVE AS THE ELEVATION LAYER OF THE NATIONAL MAP, AND PROVIDE FOUNDATIONAL ELEVATION INFORMATION FOR EARTH SCIENCE STUDIES AND MAPPING APPLICATIONS IN THE UNITED STATES. SCIENTISTS AND RESOURCE MANAGERS USE 3DEP DATA FOR HYDROLOGIC MODELING, RESOURCE MONITORING, MAPPING AND VISUALIZATION, AND MANY OTHER APPLICATIONS. THE ELEVATIONS IN THIS DEM REPRESENT THE TOPOGRAPHIC BARE-EARTH SURFACE. THE SEAMLESS 1/3 ARC-SECOND DEM LAYERS ARE DERIVED FROM DIVERSE SOURCE DATA THAT ARE PROCESSED TO A COMMON COORDINATE SYSTEM AND UNIT OF VERTICAL MEASURE. THESE DATA ARE DISTRIBUTED IN GEOGRAPHIC COORDINATES IN UNITS OF DECIMAL DEGREES, AND IN CONFORMANCE WITH THE NORTH AMERICAN DATUM OF 1983 (NAD 83). ALL ELEVATION VALUES ARE IN METERS AND. OVER THE CONTINENTAL UNITED STATES, ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). THE SEAMLESS 1/3 ARC-SECOND DEM LAYER PROVIDES COVERAGE OF THE CONTERMINOUS UNITED STATES, HAWAII, PUERTO RICO, OTHER TERRITORIAL ISLANDS, AND IN LIMITED AREAS OF ALASKA. THE SEAMLESS 1/3 ARC-SECOND DEM IS AVAILABLE AS PRE-STAGED PRODUCTS TILED IN 1 DEGREE BLOCKS IN ERDAS .IMG, ESRI ARC-GRID, AND GRID FLOAT FORMATS. THE SEAMLESS 1/3 ARC-SECOND DEM LAYER IS UPDATED CONTINUALLY AS NEW DATA BECOME AVAILABLE. OTHER 3DEP PRODUCTS ARE NATIONALLY SEAMLESS DEMS IN RESOLUTIONS OF 1, AND 2 ARC SECONDS. THESE SEAMLESS DEMS WERE REFERRED TO AS THE NATIONAL ELEVATION DATASET (NED) FROM ABOUT 2000 THROUGH 2015 AT WHICH TIME THEY BECAME THE SEAMLESS DEM LAYERS UNDER THE 3DEP PROGRAM AND THE NED NAME AND SYSTEM WERE RETIRED. OTHER 3DEP PRODUCTS INCLUDE ONE-METER DEMS PRODUCED EXCLUSIVELY FROM HIGH RESOLUTION LIGHT DETECTION AND RANGING (LIDAR) SOURCE DATA AND FIVE-METER DEMS IN ALASKA AS WELL AS VARIOUS SOURCE DATASETS INCLUDING THE LIDAR POINT CLOUD AND INTERFEROMETRIC SYNTHETIC APERTURE RADAR (IFSAR) DIGITAL SURFACE MODELS AND INTENSITY IMAGES. ALL 3DEP PRODUCTS ARE PUBLIC DOMAIN.



VICINITY MAP
NOT TO SCALE



SITE PLAN
NOT TO SCALE

SITE INFORMATION:

SITE PLAN STATISTICS
- SITE AREA: 20,407.12 AC
- DISTURBED AREA: 189.9 AC

PROJECT LOCATION
- SAN EMIDIO UNIT AREA IN ALL OR PORTIONS OF SECTIONS 19-22 AND 27-34, TOWNSHIP 30 NORTH, RANGE 23 EAST; SECTIONS 3-10, 15-22, AND 27-34, TOWNSHIP 29 NORTH, RANGE 23 EAST (T29N, R23E), MOUNT DIABLO BASELINE AND MERIDIAN (MDB&M).

ENGINEERS STATEMENT:

I, TODD GAMMILL, DO HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED BY ME OR UNDER MY SUPERVISION AND WAS COMPLETED ON THE 15th DAY OF JUNE, 2020.

TODD GAMMILL, P.E. #13693

PROFESSIONAL ENGINEER - STATE OF NEVADA
TODD W. GAMMILL
Exp: 06/30/21
CIVIL
No. 13693
7/7/20

SHEET INDEX

SHT No.	DWG ID	DRAWING DESCRIPTION
1	T-1	TITLE SHEET
2	S-1	PRELIMINARY SITE PLAN
3	G-1	PRELIMINARY GRADING PLAN
4	G-2	PRELIMINARY GRADING PLAN
5	G-3	PRELIMINARY GRADING PLAN
6	G-4	PRELIMINARY GRADING PLAN
7	G-5	PRELIMINARY GRADING PLAN
8	D-1	DETAIL SHEET
9	D-2	DETAIL SHEET

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
TITLE SHEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

1707.005 JUNE 2020

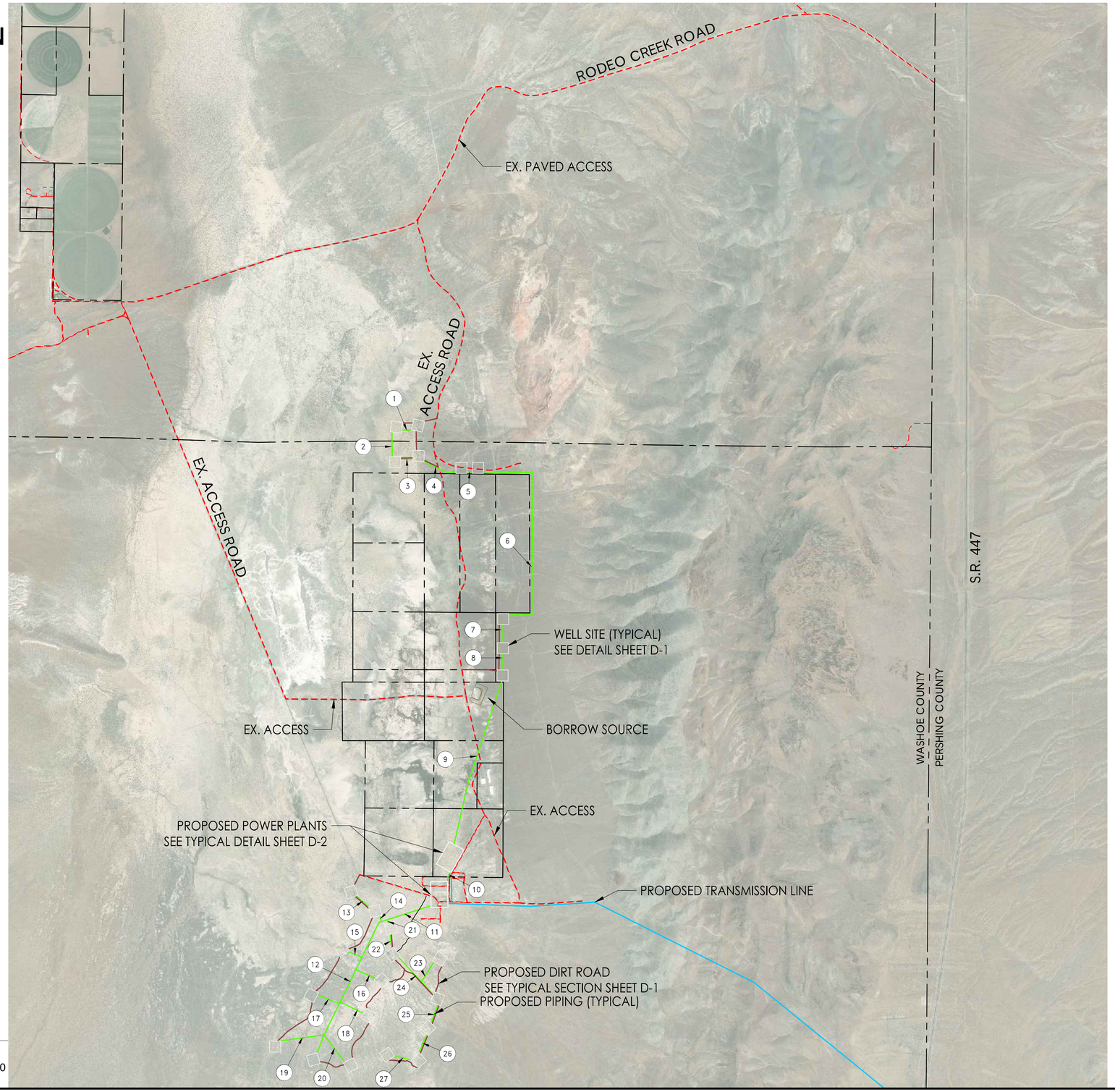
SHEET T-1 OF 9

J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_GIA\Planning\Dwg\COT_SUP_JVVG_T01.dwg 6/15/2020 11:51 AM Todd Gammill

WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT
SITE & UTILITY PLAN



UTILITY NOTES

1. 380 LF WATER PIPE
2. 955 LF WATER PIPE
3. 474 LF WATER PIPE
4. 1324 LF WATER PIPE
5. 210 LF WATER PIPE
6. 7796 LF WATER PIPE
7. 700 LF WATER PIPE
8. 625 LF WATER PIPE
9. 6562 LF WATER PIPE
10. 400 LF WATER PIPE
11. 2107 LF WATER PIPE
12. 5578 LF WATER PIPE
13. 633 LF WATER PIPE
14. 232 LF WATER PIPE
15. 583 LF WATER PIPE
16. 831 LF WATER PIPE
17. 911 LF WATER PIPE
18. 1000 LF WATER PIPE
19. 1699 LF WATER PIPE
20. 1317 LF WATER PIPE
21. 151 LF WATER PIPE
22. 541 LF WATER PIPE
23. 918 LF WATER PIPE
24. 1973 LF WATER PIPE
25. 753 LF WATER PIPE
26. 758 LF WATER PIPE
27. 646 LF WATER PIPE

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH

0 2000 1000 4000

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
SITE & UTILITY PLAN

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1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

1707.005 JUNE 2020

SHEET **S-1** OF **9**

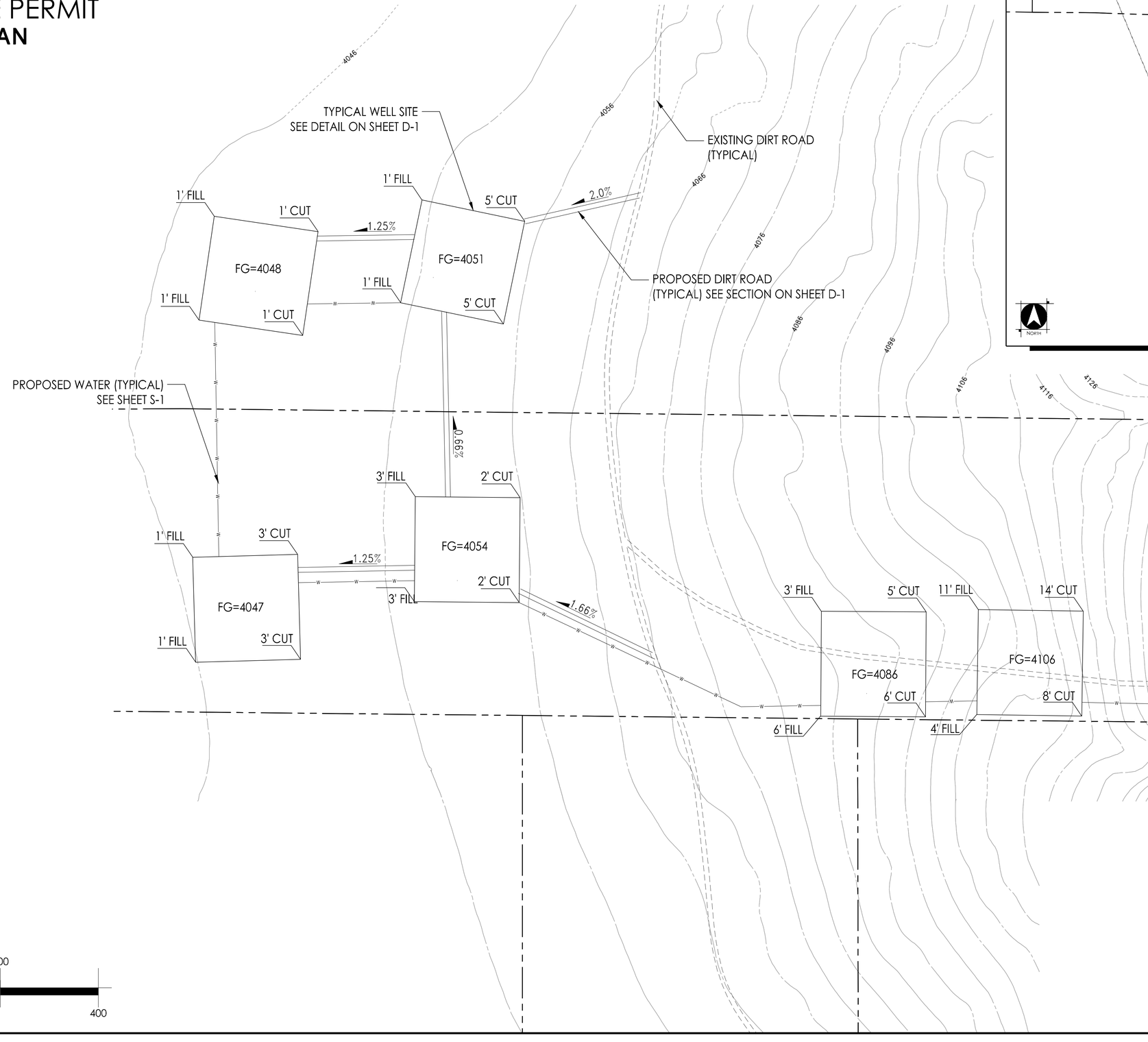
WSUP20-0013
EXHIBIT P

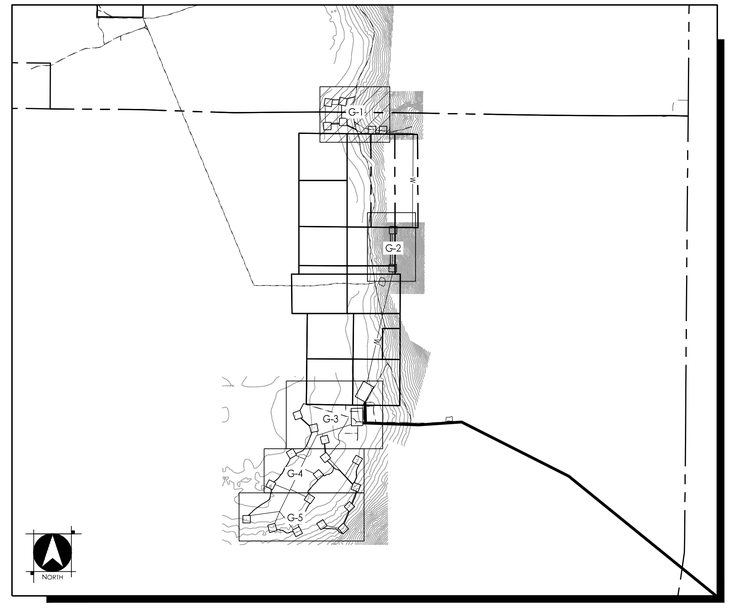
J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_OA\Planning\Dwg\C02_SUP_NVG_S01.dwg 7/2/2020 8:47 AM Todd Gimmill

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN





KEY MAP
NOT TO SCALE

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH
0 200
100 400

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

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1707.005 JUNE 2020

SHEET **G-1** OF **9**

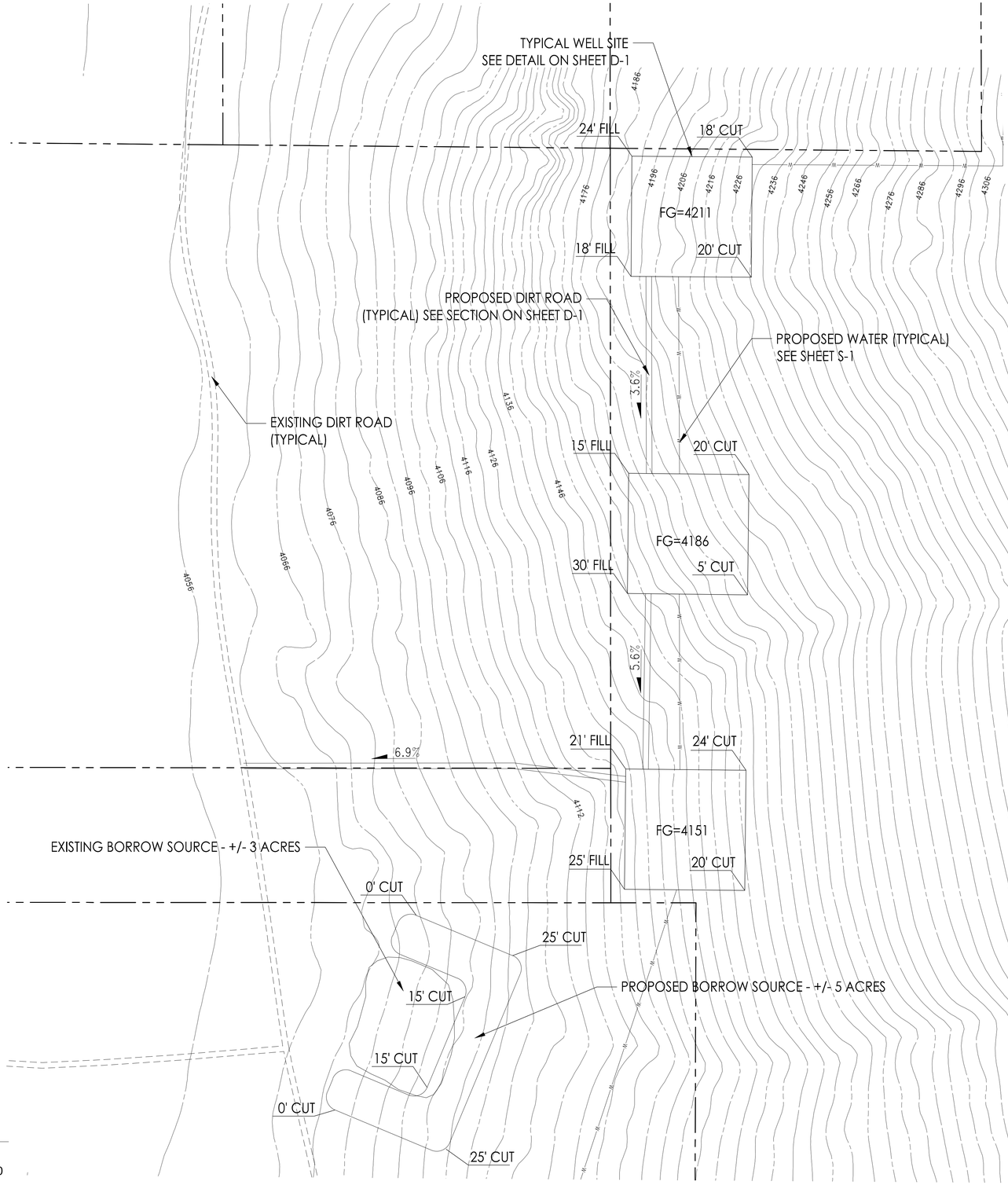
J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_OA\Planning\Dwg\C03_SUP_NVG_G01.dwg 6/15/2020 11:52 AM Todd Gemmill

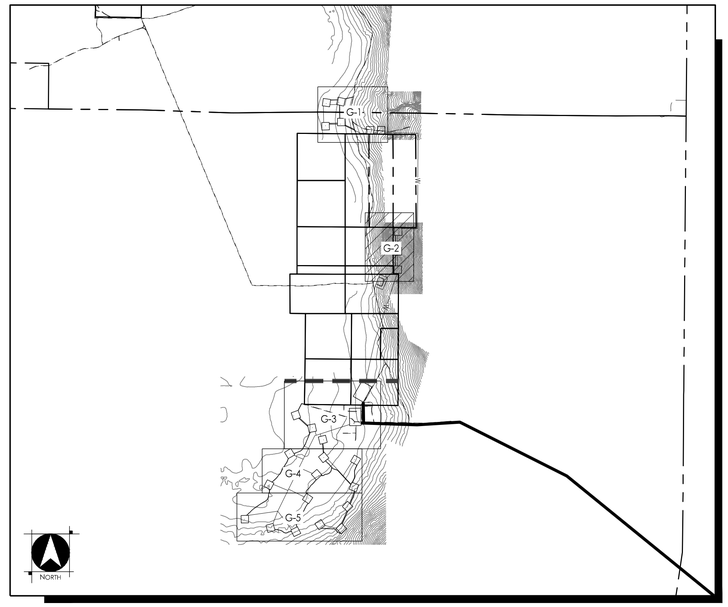
WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN





KEY MAP
NOT TO SCALE

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH

0 200 100 400

NORTH VALLEY GEOTHERMAL DEVELOPMENT

GRADING PLAN

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1707.005

JUNE 2020

SHEET **G-2** OF **9**

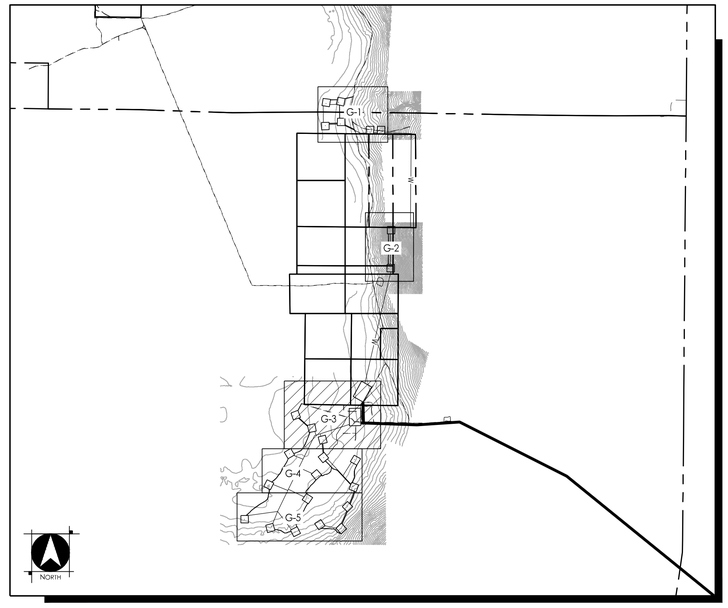
J:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_DA\Planning\Dwg\C04_SUP_NVG_G02.dwg 7/2/2020 9:01 AM Todd Gemmill

WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN



KEY MAP
NOT TO SCALE

0' FILL
3' CUT
FG=4053
2' FILL
PROPOSED POWER PLANT SITES
SEE TYPICAL DETAIL SHEET D-2
4046
0' CUT
1' FILL
1' CUT
0.30%
0' CUT
PROPOSED DIRT ROAD
(TYPICAL) SEE SECTION ON SHEET D-1
EXISTING DIRT ROAD
(TYPICAL)
1' FILL
FG=4039
1' CUT
FG=4051
0' FILL
0.40%
1' CUT
TYPICAL WELL SITE
SEE DETAIL ON SHEET D-1
1' CUT
0' FILL
FG=4041
1' CUT
0' FILL
1' FILL
PROPOSED TRANSMISSION LINE
SEE SHEET S-1
1' CUT
PROPOSED WATER (TYPICAL)
SEE SHEET S-1
1' FILL
FG=4043
1' CUT
1' FILL
4056

NORTH
0
100
200
400

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

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1707.005 JUNE 2020

SHEET **G-3** OF **9**

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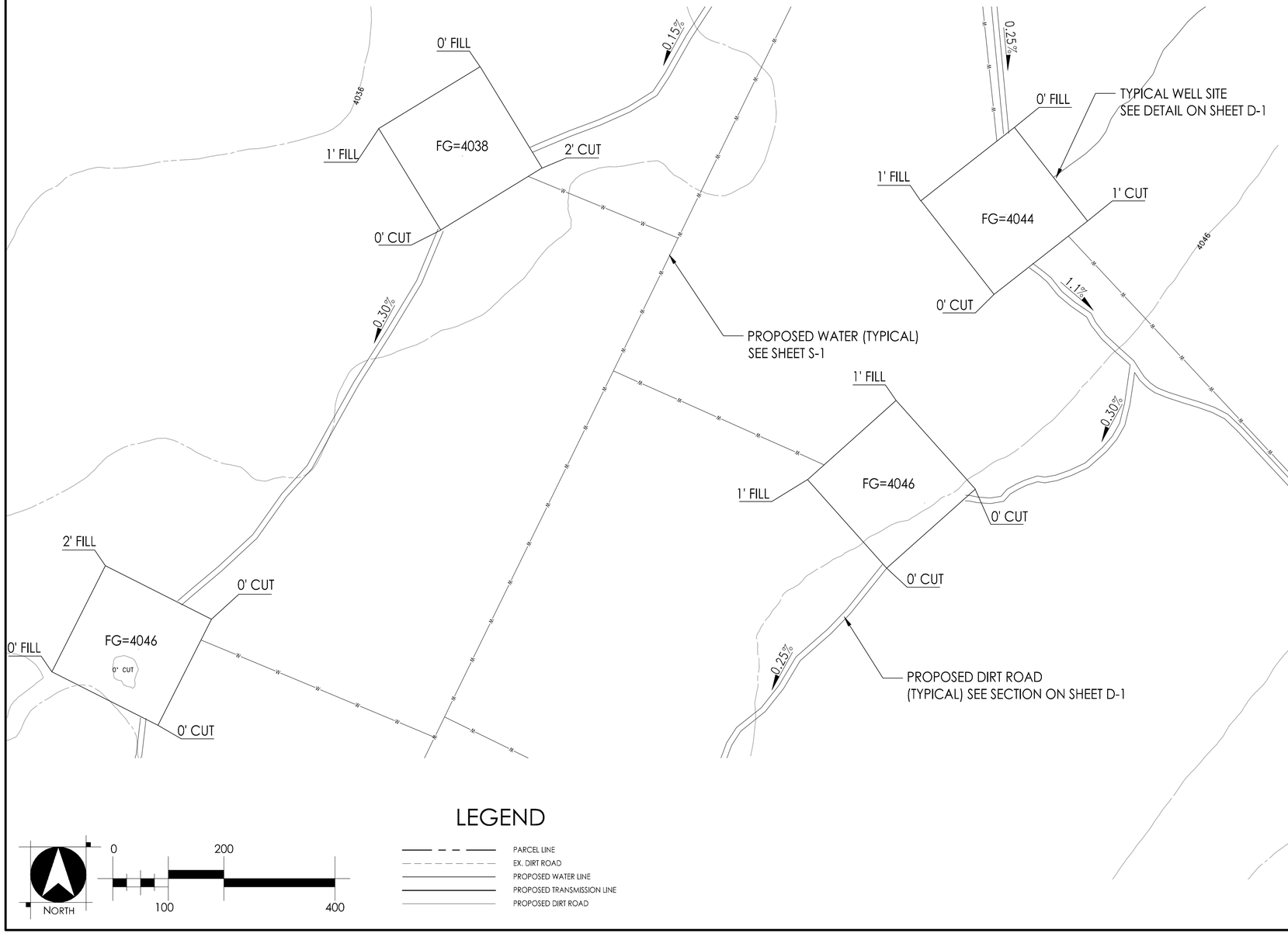
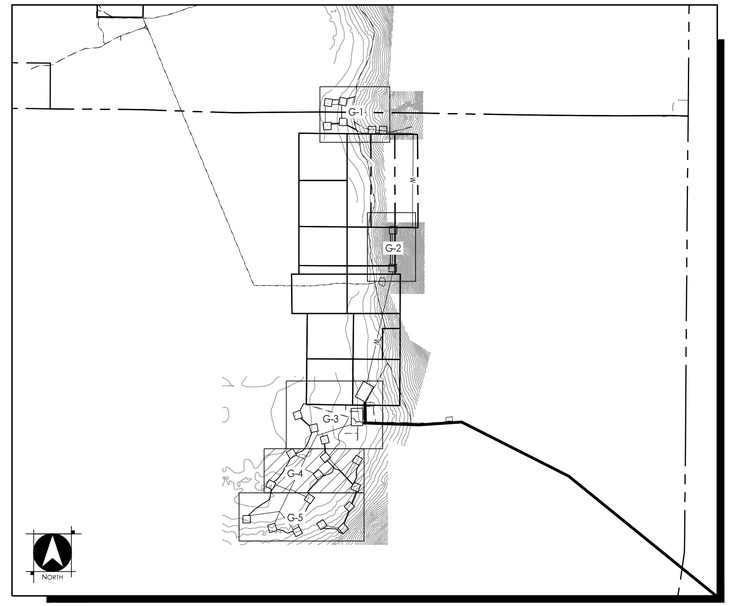
NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN





KEY MAP
NOT TO SCALE

LEGEND

NORTH
0
200
100
400

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH VALLEY GEOTHERMAL DEVELOPMENT

GRADING PLAN

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1707.005

JUNE 2020

SHEET **G-4** OF **9**

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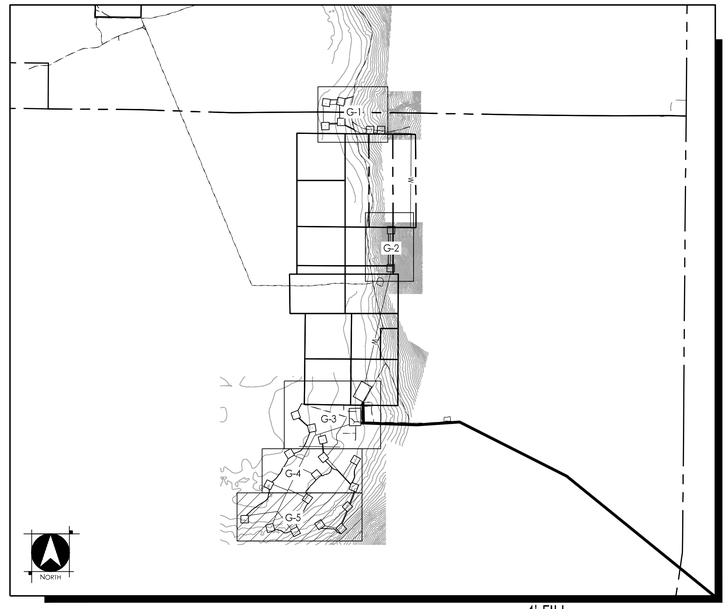
NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

GRADING PLAN



KEY MAP
NOT TO SCALE

2' FILL
2' CUT
FG=4046
1' CUT
0.25%
2' FILL
PROPOSED WATER (TYPICAL)
SEE SHEET S-1
0' FILL
0.25%
1' FILL
FG=4046
2' CUT
2' CUT
4046
1.0%
PROPOSED DIRT ROAD
(TYPICAL) SEE SECTION ON SHEET D-1
2' FILL
2' FILL
FG=4051
6' CUT
5' CUT
1.0%
2' FILL
2' FILL
FG=4061
3' CUT
3' CUT
TYPICAL WELL SITE
SEE DETAIL ON SHEET D-1
4056
2' FILL
2' FILL
FG=4064
3' CUT
4086
3' CUT
0.30%
4' FILL
4' FILL
0.65%
FG=4066
7' CUT
6' CUT
1.3%
5' FILL
5' FILL
FG=4081
12' CUT
4086
4076
9' CUT

LEGEND

- PARCEL LINE
- EX. DIRT ROAD
- PROPOSED WATER LINE
- PROPOSED TRANSMISSION LINE
- PROPOSED DIRT ROAD

NORTH
0
200
100
400

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
GRADING PLAN

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

1707.005
JUNE 2020

SHEET **G-5** OF **9**

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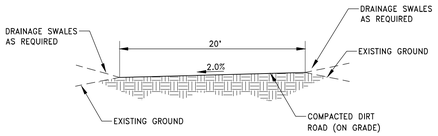
WSUP20-0013
EXHIBIT P

NORTH VALLEY GEOTHERMAL DEVELOPMENT

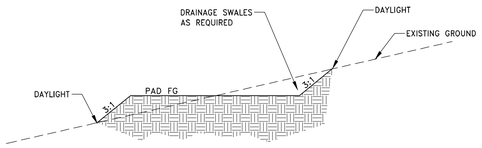
SPECIAL USE PERMIT

DETAIL SHEET



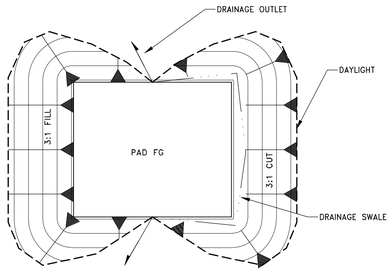
TYPICAL ROAD SECTION

NOT TO SCALE



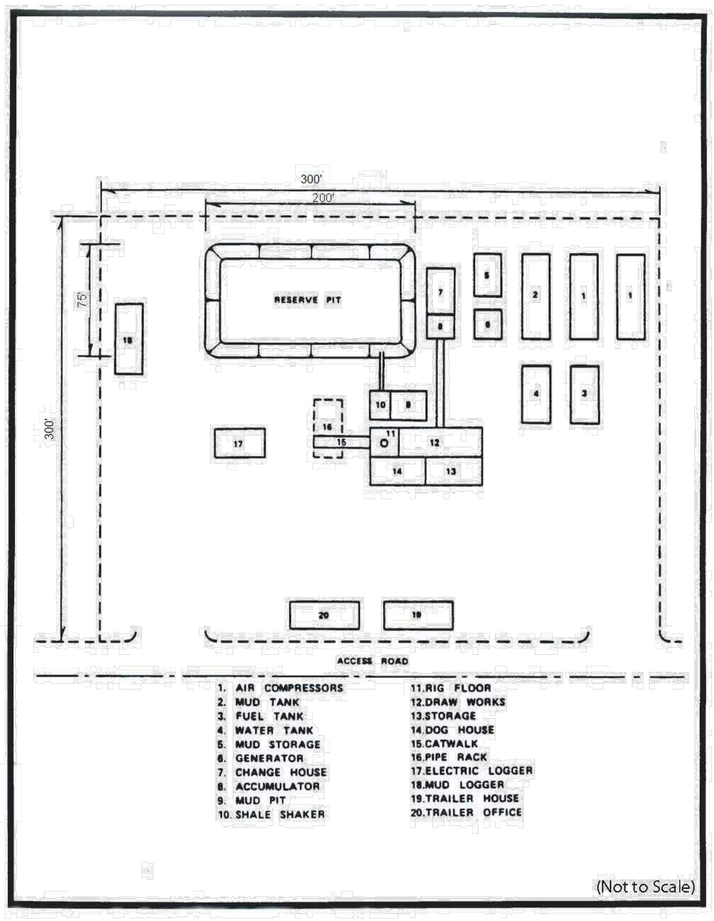
TYPICAL PAD GRADING SECTION

NOT TO SCALE



TYPICAL PAD GRADING PLAN

NOT TO SCALE



TYPICAL GEOTECHNICAL WELL PAD LAYOUT

NOT TO SCALE

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
DETAIL SHEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

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SHEET **D-1** OF **9**

WSUP20-0013
EXHIBIT P

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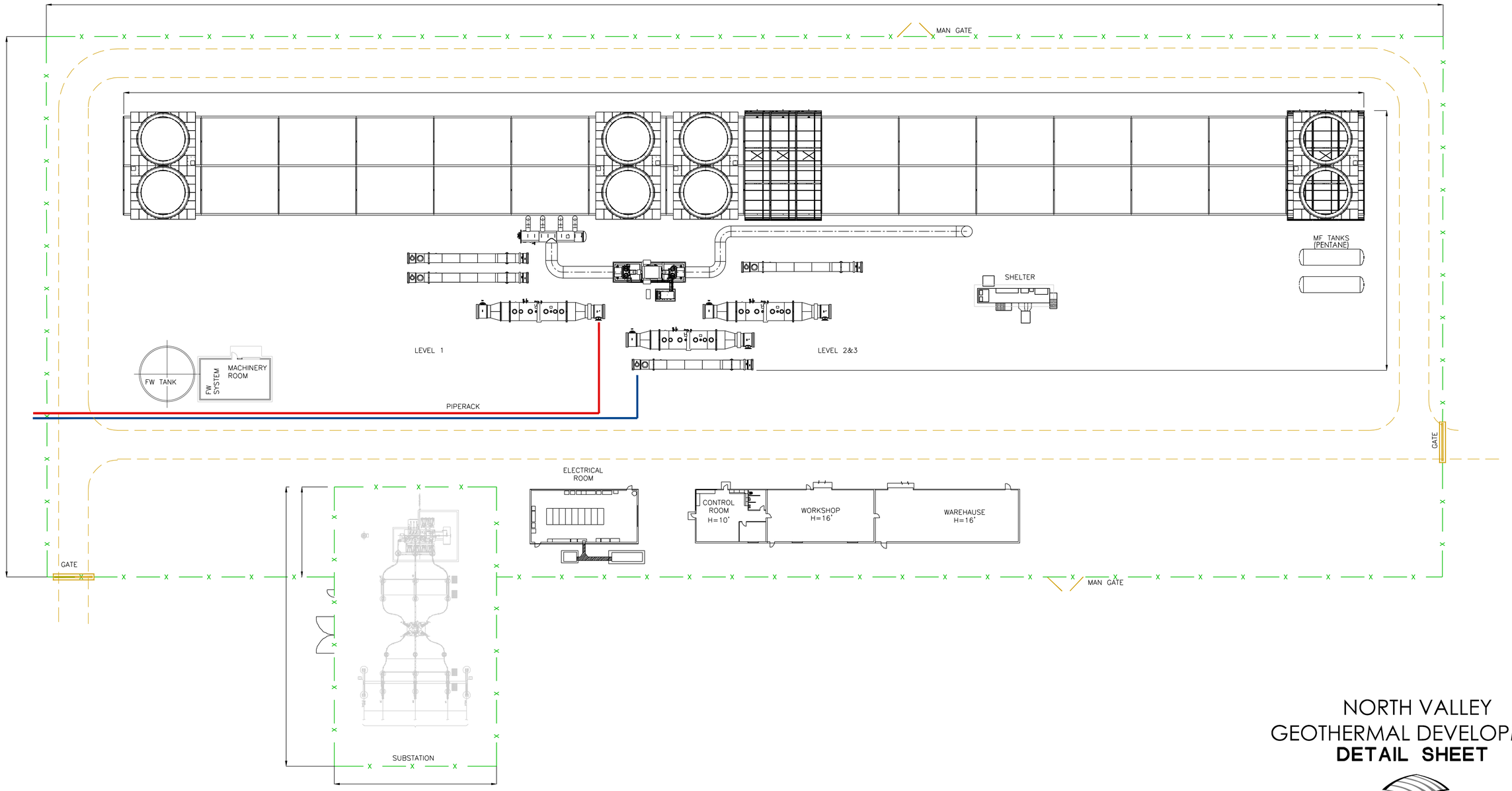
NORTH VALLEY GEOTHERMAL DEVELOPMENT

SPECIAL USE PERMIT

DETAIL SHEET



TYPICAL POWER PLANT
(NTS)

NORTH VALLEY
GEOTHERMAL DEVELOPMENT
DETAIL SHEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel 775.823.4068
Fax 775.823.4066

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EXHIBIT P

d:\Jobs\1707_Steamboat Hills Geothermal\North_Valley_Geothermal_DA\Planning\Dwg\C09_SUP_NVG_D02.dwg 6/30/2020 3:00 PM Todd Gemmill