

**Special Use Permit Application
Turquoise Solar LLC, 60MW Solar Energy Project
East Truckee Canyon, Washoe County NV**

Prepared For:

Turquoise Solar LLC
c/o Jill M. Daniel
Estuary Capital Partners
One Sansome Street, Suite 2900
San Francisco, CA 94104
(415) 254-3419

and

Gary Nelson,
Stonefield, Inc.
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Sparks, NV 89434
775-358-6100

Prepared By:

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May 15, 2015

Stantec Project No. 180101351

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Stantec Consulting Services Inc.
6995 Sierra Center Parkway, Reno NV 89511-2213
Phone: 775 850-0777

May 15, 2015

Trevor Lloyd, AICP
Washoe County Department of Community Development
1001 E. Ninth
Reno, Nevada 89520

Reference: Turquoise Solar LLC 60MW Solar Project Special Use Permit Submittal

Dear Trevor,

Enclosed please find an original, 25 copies and a CD of the special use permit application for the above referenced project submitted on behalf of Turquoise Solar LLC and Stonefield Inc. The contents of this application speak to the project specifics which require the staff and Washoe County Board of Adjustments' consideration. The project owner, Turquoise Solar LLC, intends to construct the first large-scale photovoltaic solar power project in northern Nevada. When completed, the 60MW project is anticipated to produce approximately 150,000 megawatt-hours of emissions-free power annually. The power from this project is anticipated to reduce carbon dioxide emissions by approximately 80,000 tons compared with Nevada's current generation mix.

The location for this project at the Reno Technology Park (RTP) is ideal. Located east of the Apple Inc. property and north of the proposed 360MW power plant at RTP, the estimated 255,000 solar panels will occupy the 585 acres of undeveloped land nestled amongst the power transmission lines, gas pipelines, telecommunications lines and easements of NV Energy, Tuscarora, and Southwest Gas. The project will be served by the RTP community water system. Because of its proximity to these utilities, the Turquoise Solar LLC project will require minimal infrastructure build-out compared with other proposed solar projects. The RTP access road will be upgraded slightly to ensure acceptable access for fire protection services. Internally, the construction and maintenance of the solar development areas will be accommodated by 12'-0" wide all-terrain vehicle accesses.

As part of the overall project, a 60MW substation and operations and maintenance building will be developed. A new 120kV transmission line will be constructed between the Turquoise Solar LLC substation and the NVE Pah Rah substation currently under development on the Apple Inc. property. Therefore, an amendment to the Regional Utility Corridor Map will be required to add the substation and transmission line, if this special use permit application is approved by the Washoe County Board of Adjustment.

I speak for all of us when I say we look forward to working with you on this exciting project.

Sincerely,

STANTEC CONSULTING SERVICES, INC.

A handwritten signature in blue ink that reads "Cynthia J. Albright".

Cynthia J. Albright, AICP
Senior Associate, Community Development Manager

v:\1801\active\180101351\applications\sup\cover letter.docx

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Development staff at 775.328.3600.

Project Information		Staff Assigned Case No.: _____	
Project Name: Turquoise Solar LLC			
Project Description: Approximately 60 MW of solar and a 60 MW substation that also includes an 18'-6" x 51.5'-0" operations and maintenance building. The solar array is located on a portions of three parcels.			
Project Address: 21575 Interstate 80 E, 21755 Interstate 80 E, 21905 Interstate 80 E			
Project Area (acres or square feet): Approximately 585 acres			
Project Location (with point of reference to major cross streets AND area locator):			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No(s):	Parcel Acreage:
084-110-26	422.45	084-110-27	195.97
084-110-24	166.26		
Section(s)/Township/Range: Section 21 - T20N - R22E			
Indicate any previous Washoe County approvals associated with this application:			
Case No.(s). SW11-001, SW11-002 and SW11-003; SW15-001; TMRPA Case #CR15-003			
Applicant Information (attach additional sheets if necessary)			
Property Owner:		Professional Consultant:	
Name: Stonefield Inc.		Name: Stantec Consulting Services, Inc.	
Address: 355 Boxington Way		Address: 6995 Sierra Center Parkway Suite 200	
Sparks, NV	Zip: 89434	Reno, NV	Zip: 89511
Phone: 775-358-6100	Fax: 775-358-6101	Phone: 775-850-0777	Fax: 775-850-0787
Email: gary@wildisland.com		Email: cynthia.albright@stantec.com	
Cell: 775-742-2546	Other:	Cell: 775-830-4048	Other:
Contact Person: Gary Nelson		Contact Person: Cynthia Albright, AICP	
Applicant/Developer:		Other Persons to be Contacted:	
Name: Turquoise Solar LLC		Name:	
Address: One Sansome Street, Suite 2900		Address:	
San Francisco, CA	Zip: 94104		Zip:
Phone: 415-254-3419	Fax:	Phone:	Fax:
Email: jill.daniel@estuarycapitalpartners.com		Email:	
Cell: same	Other:	Cell:	Other:
Contact Person: Jill Daniel, Managing Director		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)

Chapter 110 of the Washoe County Code is commonly known as the Development Code. Specific references to special use permits may be found in Article 810, Special Use Permits.

1. What is the type of project being requested?

Turquoise Solar LLC (TS) would like to augment northern Nevada's supply of renewable energy and construct approximately 60MW solar photo voltaic project in accordance with Section 110.304.30, Table 110.302.05.4. In addition to the solar arrays (approximately 40 panels per array) TS will construct a 60MW substation to step up the power from 34.5kV to 120kV and tie into the planned NVE Pah Rah substation located on the Apple Inc. property. The Apple Inc. substation and the NVE substation were approved by both Washoe County and the Truckee Meadows Regional Planning Agency with the final conformance hearing held May 13, 2015. The case numbers are provided on page 1. The subject property consists of both industrial and general rural regulatory zones which both allow for a renewable energy use with approval of a Special Use Permit by the Washoe County Board of Adjustment. The proposed solar project encompasses approximately 585 acres. The estimated number of solar arrays is 7,080. An estimated 255,000 panels are planned. Final design efforts, particularly with respect to hydrology and slopes, will determine the actual number and locations of the solar arrays to produce approximately 60 MW of renewable energy.

2. What currently developed portions of the property or existing structures are going to be used with this permit?

The subject property consists of approximately 585 acres and is located on the far northeast side of the Reno Technology Park (RTP) 8 miles east of Sparks in the Truckee Canyon Area Plan. The subject property is undeveloped, except for access roadways that serve existing utility easements and the roadway built to serve the technology park. A source of domestic water for the technology park is located in wells near the 60MW solar project. Development of this project will require construction of linear infrastructure to the water supply for purposes of construction and for cleaning the solar arrays as needed.

3. What improvements (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.) will have to be constructed or installed and what is the projected time frame for the completion of each?

Development of the 60MW of photo voltaic solar power project will occur in a single phase of construction. The only improvements necessary are internal all terrain vehicle access roadways constructed of road base and a water supply line. The applicant intends to begin as soon as the building permit is obtained with connection to the NVE substation on or about September 2016. Primary access to the subject property will come from the existing RTP eastern access roadway. Applicant contacted Truckee Meadows Fire Protection District to confirm fire access to the site is required, but access to 150 feet of all points or panels on site is not required.

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

One phase.

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

The subject property is ideally suited for solar photo voltaic power energy production. The overall topography generally slopes in a near southerly direction with slope gradients ranging from 4 to over 30 percent. The central to southern portions of the project area range from 4 to 14 percent. South facing slopes are ideal for energy production and variable terrain further enhances maximum panel exposure for maximum energy output. The surrounding parcels north, east and west are owned by the United States of America with a regulatory zone of Open Space. The property south of the proposed solar project is zoned Industrial and is part of the larger Reno Technology Park. There are no residential uses or residential regulatory zoned property within the viewshed of the proposed Turquoise Solar LLC project.

The proposed roadways have been designed to minimize natural land form disturbance. No grading cut exceeds 10' in depth. Grading of the roadways does not result in slopes in excess of, or steeper than, three horizontal to one vertical (3:1) as specified in Sections 110.438.36 and 110.438.45 in the Washoe County Development Code. The access roadways are intended for all terrain vehicles with a roadway width that meets Washoe County design standards of 24'-0" wide. Two (2) 2'-0" feet shoulders buffer the roadway section.

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

The proposed solar project is perfectly suited for the property in a location immediately north of the 360MW power plant that was been approved as a future use with SPW11-001 (Power Plant). As seen on the attached mapping, the area surrounding the proposed solar project is consumed with the overhead and underground utilities from numerous providers and/or has a regulatory zone of open space which cannot be developed. The project will produce approximately 150,000 megawatt-hours of emissions-free power annually. The power from the project will reduce carbon dioxide emissions by approximately 80,000 tons compared with Nevada's current generation mix. The solar project is located in an area with almost all required electrical, water and road infrastructure in place.

7. What will you do to minimize the anticipated negative impacts or effects your project will have on adjacent properties?

The surrounding parcels north, east and west are owned the by United States of America and the property south is part of the Reno Technology Park. No negative impacts or effects are anticipated with construction of a renewable energy supply in the form of solar on this property.

8. Please describe operational parameters and/or voluntary conditions of approval to be imposed on the project special use permit to address community impacts:

We do not foresee any community impacts at this location for the proposed use.

9. How many improved parking spaces, both on-site and off-site, are available or will be provided? (Please indicate on site plan.)

On site parking is not needed. The solar project will be operated primarily via computer remotely. Routine maintenance and/or repairs will be conducted via support staff who will come to the site on an as needed basis.

10. What types of landscaping (e.g. shrubs, trees, fencing, painting scheme, etc.) are proposed? (Please indicate location on site plan.)

On-site landscaping would not be appropriate for the proposed use. Furthermore, Washoe County and the master developer, Unique Infrastructure Group, agreed during approval of the SW11-001 Special Use Permit that landscaping would be required only at the project entries to the Reno Technology Park when it was built out. The perimeter fence will be constructed of a post and wire material. The RTP property has on-site roaming security staff to prevent trespassers from entering.

11. What type of signs and lighting will be provided? On a separate sheet, show a depiction (height, width, construction materials, colors, illumination methods, lighting intensity, base landscaping, etc.) of each sign and the typical lighting standards. (Please indicate location of signs and lights on site plan.)

A temporary project sign will be erected at the subject property for purposes of construction/materials delivery. A permanent project monument sign, consistent with Washoe County Development standards, may be constructed at the project entry. The only lighting to be provided will be for security and personnel access at the Substation and Operations and Maintenance Building.

12. 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.)

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

13. Community Sewer

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Community Water

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
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Turquoise Solar LLC Special Use Permit Application Supplemental Information

1.0 Introduction

In accordance with Washoe County Development Code Section 110.302.05, Renewable Energy production is permitted in Industrial and General Rural regulatory zones with a Washoe County Special Use Permit application approved by the Board of Adjustment. Preparation of this submittal included a thorough review of Development Code Sections 110.438.36 and Major Grading Permit Application Requirements, 110.438.45 Grading of Slopes, and found that the preliminary engineering of the proposed solar project complies with all of the provisions within these code sections. It must be noted that the solar arrays are located on slopes in excess of 30 percent. In accordance with Code Section 110.424.00, site development will be limited to all-terrain vehicle accesses to minimize disruption to the natural topography; stormwater runoff will be accommodated by a series of detention basins to minimize adverse impacts to the water quality, and grading impacts will be minimized by a post/pile construction technique. The solar development area is "Preliminary." The initial layout and grading respected the existing drainage features on site. Additional hydrologic investigation and final analyses are necessary to determine if the development areas can further encroach upon the areas labeled as "preliminary areas high flow velocity." It is the applicant's intent to achieve 60MW of photo voltaic solar power production capacity at the site in order to maximize scale economies and offer power users the most economical power possible.

2.0 Project Location

The Turquoise Solar Project is comprised of approximately 585 acres located in the northeast corner of the Reno Technology Park in the Truckee Canyon. The proposed project will be accessed via all-weather access road within the technology park. Interstate access is via the I-80 EB/WB off ramp at Tracy, approximately 11 miles west of Sparks. The property is undeveloped except for access easements, overhead and underground utilities.

Figure 1.0, **Vicinity Map**, identifies the location of the proposed project in the Truckee Canyon and in relation to the larger Reno Technology Park.

Figure 2.0, **Site Features Map**, illustrates the existing and surrounding land area for the proposed site. The project occupies nearly a full section of land near the base of the Pah Rah Range. The north end of the property is located in steeply sloping terrain with significant slope gradients. The balance of the property has varied topography and hydrologic conditions present. The surrounding undeveloped large parcels are public lands owned by the United States of America and designated as Open Space regulatory zone on the Washoe County Master Plan Map. The Tuscarora pipeline and easement cross the property in an east-west direction. An NVE transmission line and a telecommunications company line also enter and exit the property at the southeast corner. The parcels that comprise the subject property of this request are also identified. The project area is entirely within Section 21 T20N R22E.

Legend

-  Reno Technology Park
-  Turquoise Solar LLC Boundary

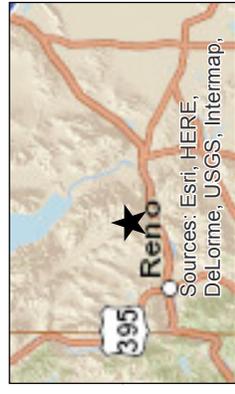
Turquoise Solar LLC
60 MW Solar Project
T20 R22 S21

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



1:144,000 (A1 Original document size of 8 1/2 x 11)

- Notes**
1. Coordinate System: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
 2. Data Source: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
 3. Orthorectified © First Base Solutions, 2015.



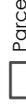
Project Location
T20N, R22E, S21
Washoe County, Nevada
180101351
Prepared by CA/abright 2015-05-15
Reviewed by J/Donnel 2015-05-15

Client/Project
Client: Turquoise Solar LLC
Project: Turquoise Solar LLC

Figure No.
1.0
Title

Vicinity Map

Legend

-  Turquoise Solar LLC Boundary
-  Parcel Base Nov 2014
-  United States of America Ownership
-  Slopes over 30%
-  Preliminary Areas High Flow Velocity
-  USGS Blue Line Streams
-  Existing Utilities and Easements
-  Gas Pipelines
-  Telecommunications
-  Transmission Lines
-  Private Roadway - Utility
-  Transmission Corridor
-  Apple 50MW Substation
-  NVE Pah Rah Switching Station/120 kV
-  RTP Access Road
-  RTP Well Sites

1:18,000 (At Original document size of 8 1/2 x 11)

- Notes**
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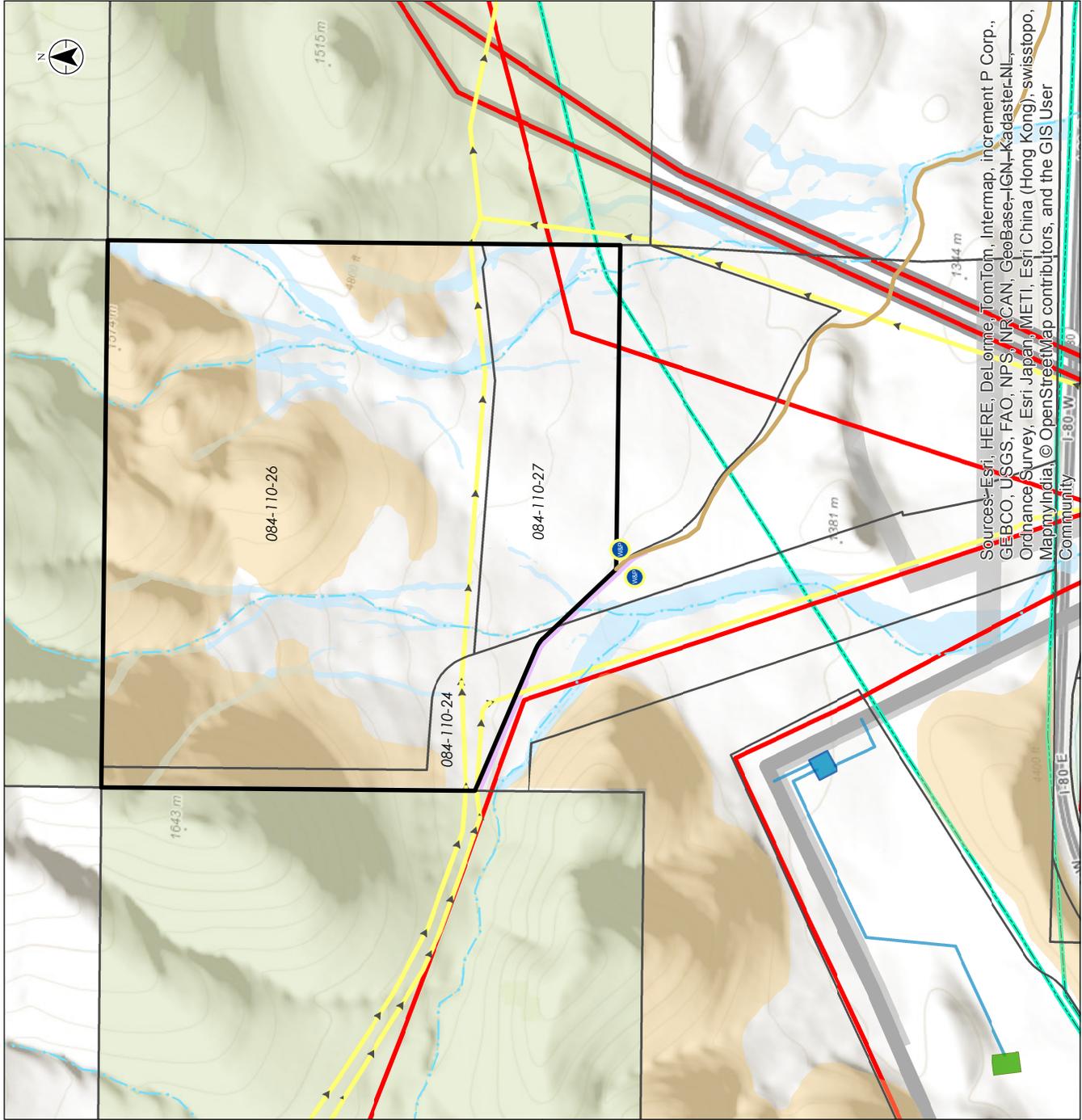


Project Location
120N, K22E, S21
Washoe County, Nevada
180101351
Prepared by CJA/blight 2015-05-14
Reviewed by Client 2015-08-14

Client/Project
Client: Turquoise Solar LLC
Project: Turquoise Solar LLC

Figure No.
2.0

Site Features Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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Image 1.0, **View North and slightly Northeast of Preliminary Development Area** as seen from the Tuscarora easement.



Image 2.0, **View Northwest of Preliminary Development Area** as seen from the Tuscarora easement.



Image 3.0, **View South of Preliminary Development Area** and across I-80 into Storey County.



3.0 Project Request

This request is for special use permits to construct a 60MW renewable energy solar project, 60MW substation and 120kV transmission line between the Turquoise Solar LLC substation and the Nevada Energy Pah Rah substation in Industrial and General Rural regulatory zones. Grading for the project is approximately than 7,200 yd³; therefore, a special use permit for grading in excess of 1,000 cubic yards for these utilities and all-terrain vehicle accesses is required. This renewable energy project will require estimated 100 acre feet of water for construction and only a single acre foot annually for operations. This project requests the establishment of an additional regional utility corridor from the proposed substation to provide an intertie between this project and the Pah Rah substation currently in design development. According to the Regional Plan, several utility corridors currently exist on the property. Topography and drainage are significant issues on the property which will require flexibility in transmission tower placement in order to minimize site disturbance and environmental considerations.

Figure 3.0, **Master Plan Land Use, Preliminary Solar Development Area and Proposed Utilities Map**, identifies the proposed solar development areas, proposed substation and transmission intertie

4.0 Project Site Conditions

4.1 Slopes

The topography varies across the proposed development area. The overall topography generally slopes in a near southerly direction with slope gradients ranging from 4 to over 40 percent. The proposed solar development area does encroach upon slopes in excess of thirty percent. A review of Article 424, Hillside Development, section 110.424.20(d) exceptions indicates that this type of proposed project would qualify for an exception consideration by the Department Director. Construction of a solar project on the proposed site will not compromise the intent and purpose of the hillside development standards. Site grading on 585 acres of land area has been minimized to less than 7,200 cy³ and slopes will be stabilized as necessary. The post/pile structures for the solar arrays and the overall type of development should not be affected by the presence of regional fault zones in the area. The cultural resources and biological review indicated there are no areas on site of rare or endangered species. The proposed site does not include significant ridgelines, rock outcroppings, canyons and landforms.

4.2 Drainage and Stormwater Management

The site is located on a southerly facing slope of the Pah Rah Range in the East Truckee Canyon, between the Patrick and Tracy exits on I-80. The project site is located within an unshaded Zone X as shown on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) for Washoe County and Incorporated Areas, panels 3084G, dated March 16, 2009. The presence of "blue line" streams on the USGS Quad map is an indication that there may be jurisdictional Waters of the United States (WOUS) present on the property.

The contributing watershed consists of undeveloped mountainous areas upstream of the site, alluvial fans and a number of ephemeral streams that cross the site that are capable of conveying significant peak flow rates and sediment loads. Offsite watersheds that drain to the property comprise approximately 25.6 square miles. A significant portion of flows from the upper watersheds are conveyed across the property via multitude of alluvial and coalescent alluvial fans.

Existing topography consists of alluvial fan deposits emanating from steep upstream watersheds. The site generally slopes in a near southerly direction with gradients ranging from four (4) to forty (40) percent in the upper portions of the site. Numerous dirt roads and utility access roads cross the project site and vegetation predominately consists of cheat grass and scattered sagebrush.

Washoe County Development Code Article 418, Significant Hydrologic Resources, was reviewed and regulations pertaining to development within and adjacent to perennial streams or potential WOUS were incorporated in the preliminary design and solar development area. The setbacks for critical stream buffer zones and sensitive stream buffer zones have been incorporated. Further hydrologic analysis and evaluation is necessary to determine if the areas identified as high velocity flows are or are not WOUS and can be channelized in a fashion that allows for further expansion into these areas or quite possibly, proposed development pulled back from the high velocity flow areas based upon the further analysis.

Onsite 5-year and 100-year event analyses were performed to estimate the increase in peak flow rates due to the proposed solar development and conceptually size and locate the required LID/Detention Basin infrastructure. These locations are shown on Engineering Sheets SG 1.1 to SG1.6.

5.0 Summary of Attached Reports

5.1 Feasibility Level Geotechnical Evaluation Report

Construction Materials Engineers (CME) prepared the feasibility level geotechnical evaluation report. In preparing this document CME reviewed previous work efforts for the Reno Technology Park prepared by several consultants for various purposes. Based upon their review of the Geologic Map of Washoe and Storey Counties, 1969, the proposed Turquoise Solar LLC project is located within either Quaternary alluvium deposits or Tertiary volcanic bedrock. The project area is so large that various soil properties exist on the site. Previous work efforts included exploratory test pits and found a geotechnical profile that consisted of silty sand with gravel and cobbles. This profile was found in different exploratory locations and occurring at various depths below ground surface (bgs). However, some clayey gravel with sand was also encountered at depths of about 19 to 20 feet bgs. The soil moisture content was generally slightly moist to moist conditions. The fact that the project site is located among four different regional active fault zones suggests a renewable energy project of solar panels is an ideal proposed use. Seismic design parameters are included in the CME report.

CME's evaluation report concludes that the proposed project can be developed as planned based upon the geotechnical evaluation. The potential shallow bedrock and abundance of cobbles may cause grading difficulties but the total amount of grading is minor, with an estimated 7,200 cy³. The soil profiles on the subject property will also restrict the solar panel foundation options and may result in more than one foundation type utilized for construction following more in depth site investigation and a structural design analysis.

The complete Geotechnical Literature Review is attached as **Appendix B**.

5.2 Biological and Cultural Due Diligence Report

Redhorse Consultants conducted a records search investigation that included contacting the Carson City District Bureau of Land Management, the Nevada Natural Heritage Program (NNHP), and the Nevada Department of Wildlife (NDOW). In summary, any wild horses in the immediate area do not fall

under the Wild Horse and Burro Act. Research into potential at-risk species indicates there are none on site or within a surrounding 1.2 mile buffer. Upon discovering the property may have potential habitat for sand cholla, an investigation was conducted by Redhorse Consultants but no sightings were observed. The sand cholla has determined to be imperiled by the NNHP and has a special status plant rating by BLM. The silty sand with gravel, cobbles and general absence of foraging habitat on site suggests the mule deer will not be impacted by the proposed development.

The complete Biological and Cultural Due Diligence Report is attached as **Appendix C**.

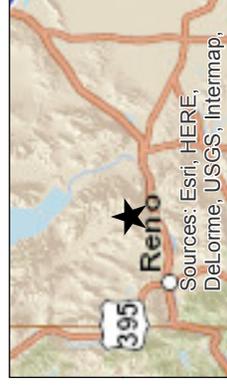
Legend

- Turquoise Solar LLC Boundary
- Parcel Base Nov 2014
- United States of America Ownership
- Slopes over 30%
- Preliminary Areas High Flow Velocity
- USGS Blue Line Streams
- Existing Utilities and Easements
- Gas Pipelines
- Telecommunications
- Transmission Lines
- Private Roadway - Utility
- Transmission Corridor
- Apple 50MW Substation
- NVE Pah Rah Switching Station/120 kV
- RTP Access Road
- RTP Well Sites



1:18,000 (At Original document size of 8 1/2 x 11)

- Notes**
1. Coordinate System: NAD 1983 StatePlane Nevada West FIPS 2703 Feet
 2. Data Source: Esri HERE, DeLorme, Intermap, Incorp., Swisstopo, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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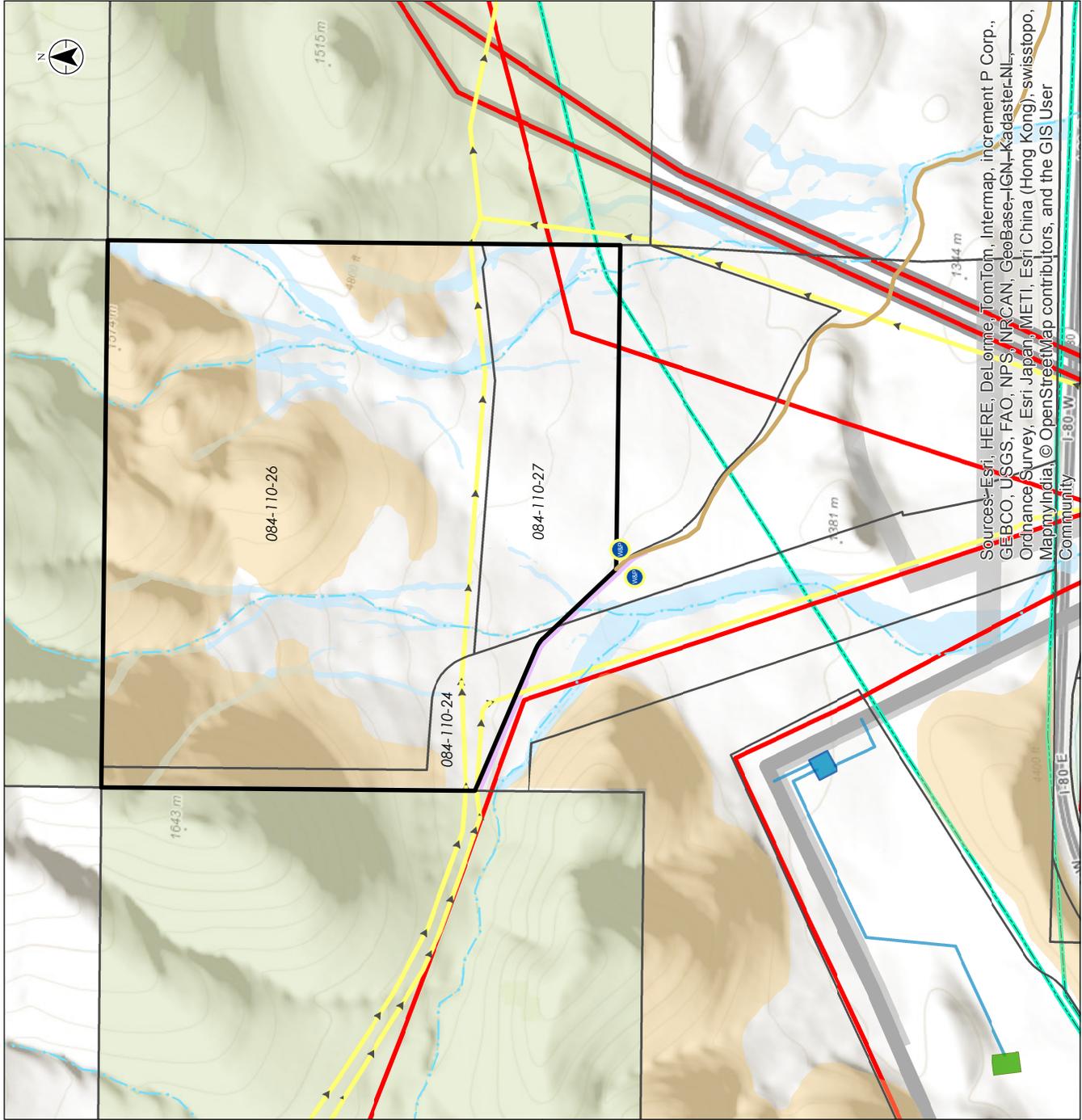


Project Location
120N, K22E, S21
Washoe County, Nevada
180101351
Prepared by CJA/blight 2015-05-14
Reviewed by Client 2015-08-14

Client/Project
Client: Turquoise Solar LLC
Project: Turquoise Solar LLC

Figure No.
2.0

Title
Site Features Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

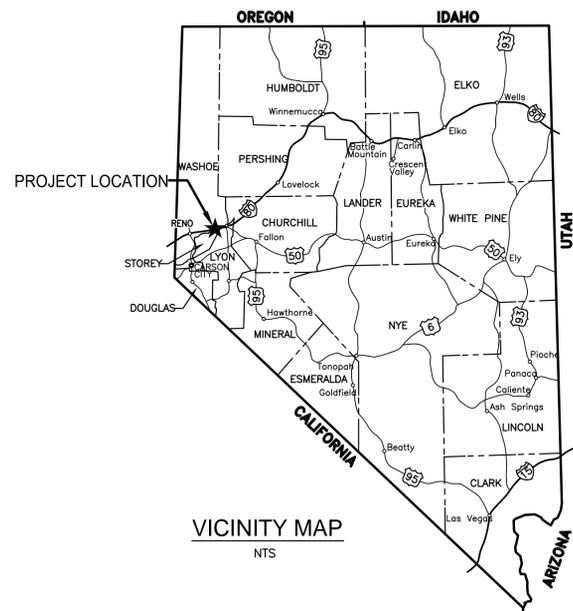
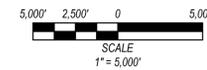
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60MW SOLAR PROJECT

TURQUOISE SOLAR LLC



LOCATION MAP



VICINITY MAP
NTS

OWNER

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SAN FRANCISCO, CA 94104
415-254-3419

MANAGING DIRECTOR
ESRUARY CAPITAL PARTNERS
JILL M. DANIEL

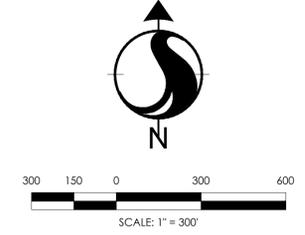
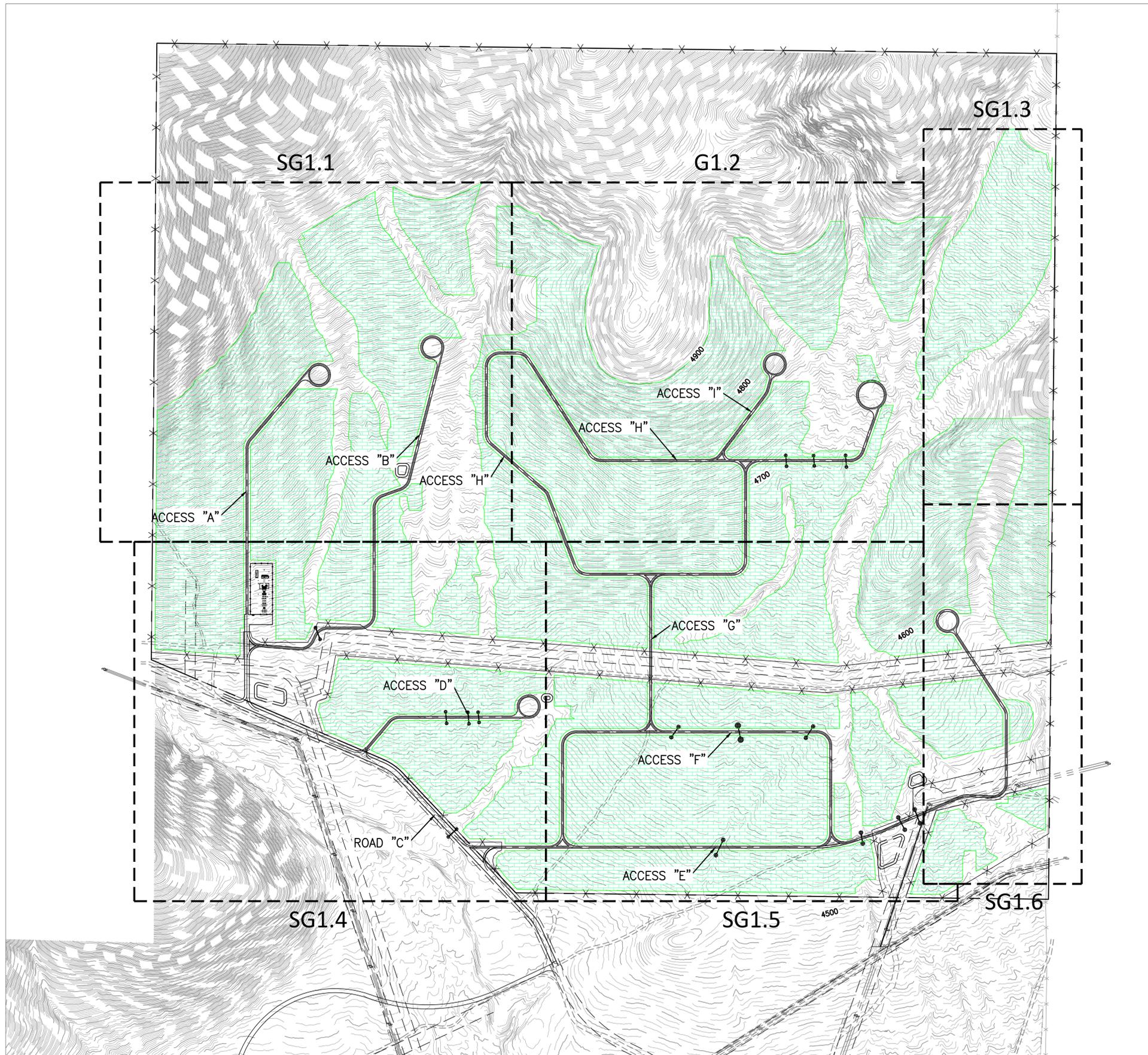


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WASHOE COUNTY
MAY 2015

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2015.05.15 11:51 AM By: Echevarria, Belen



EARTHWORK QUANTITIES		
ACCESS	CUT (CY)	FILL (CY)
A	970	560
B	555	155
ROAD C	1,125	285
D	310	140
E	760	895
F	480	135
G	580	175
H	1,915	4,515
I	410	255
TOTAL	7,105	7,115



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1.	BME	jpo	15.05.15
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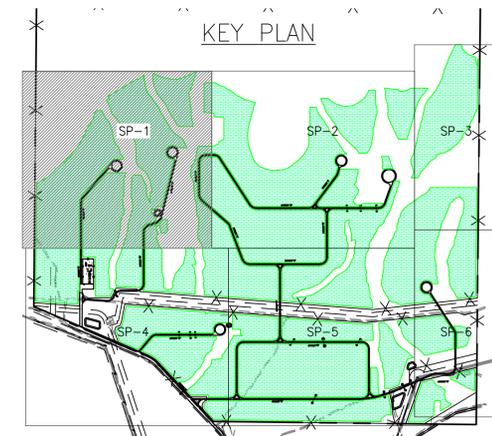
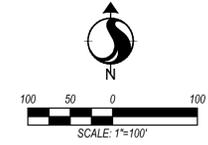


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60MW SOLAR PROJECT
Washoe County, Nevada



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File Name: 1351_eccp_sp-0.dwg
BME RRB jpo 15.05.14
Dwn Chkd. Dsgn. YY.MM.DD
Drawing No. **SG1.0**
Revision Sheet

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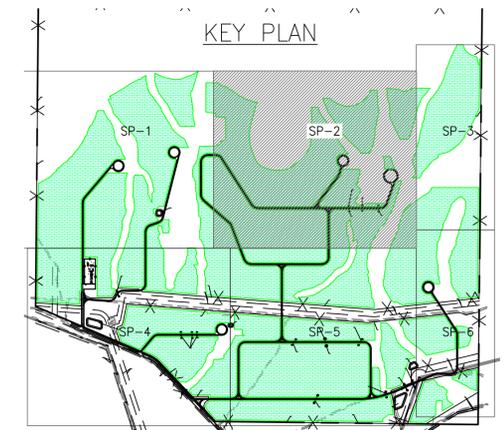
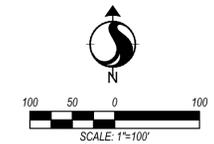
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Project Number: 180101351
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Drawing No. **SG1.1**
 Revision Sheet

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 2015/05/15 11:52 AM By: Echenarra, Belan



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SITE PLAN AND GRADING PLAN

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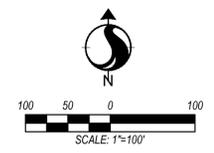
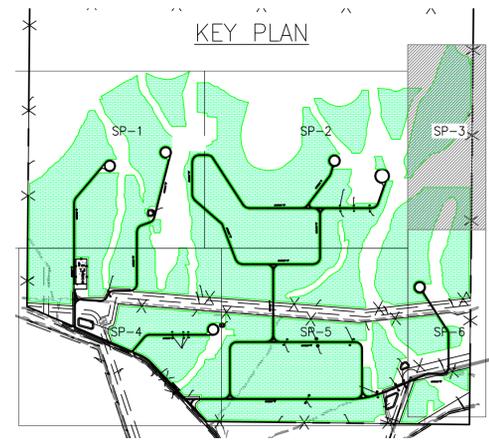
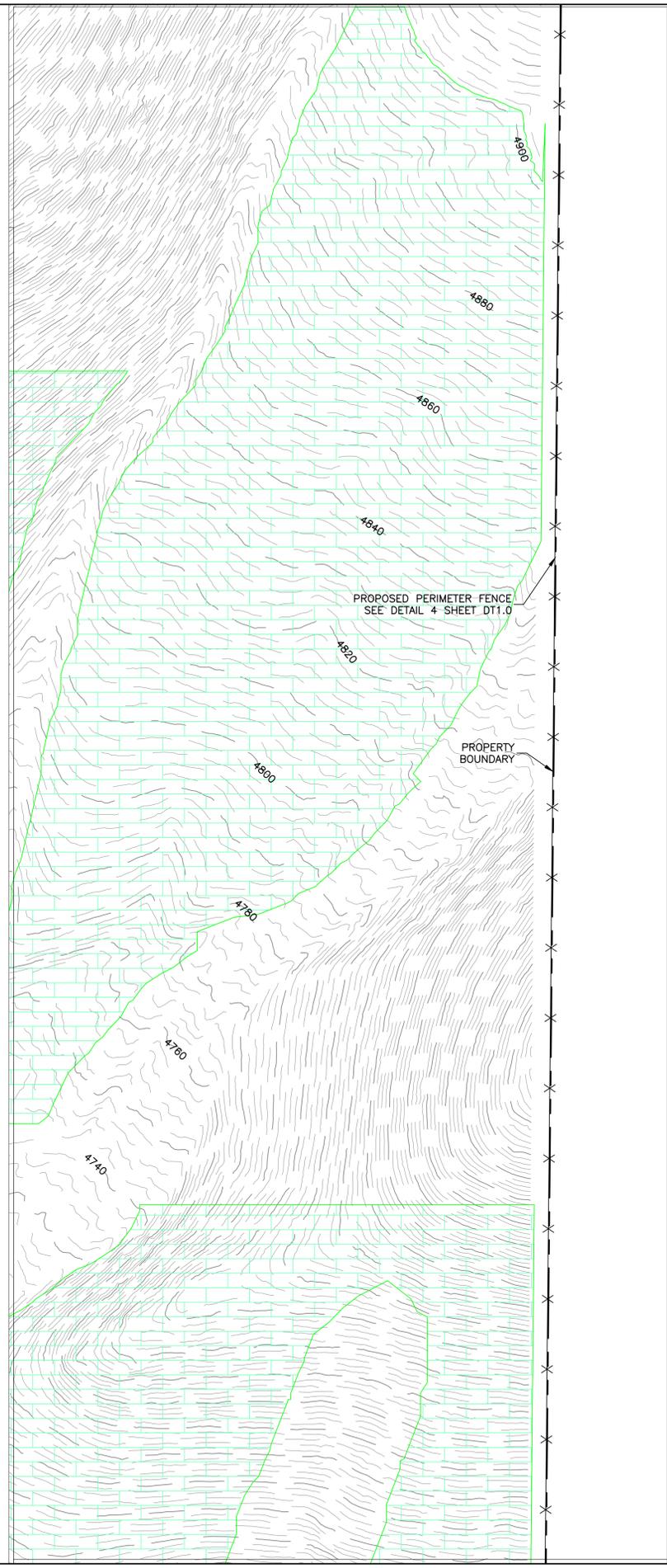
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Drawing No. **SG1.2**
 Revision Sheet
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2015.05.15 11:52:26 AM Echenvarria, Brian



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1.	BME	jpd	15.05.15
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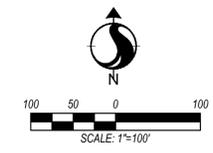
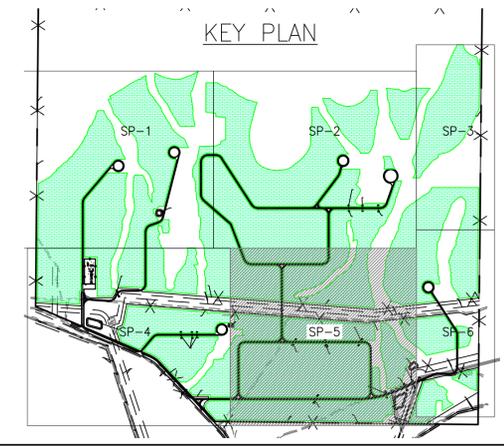
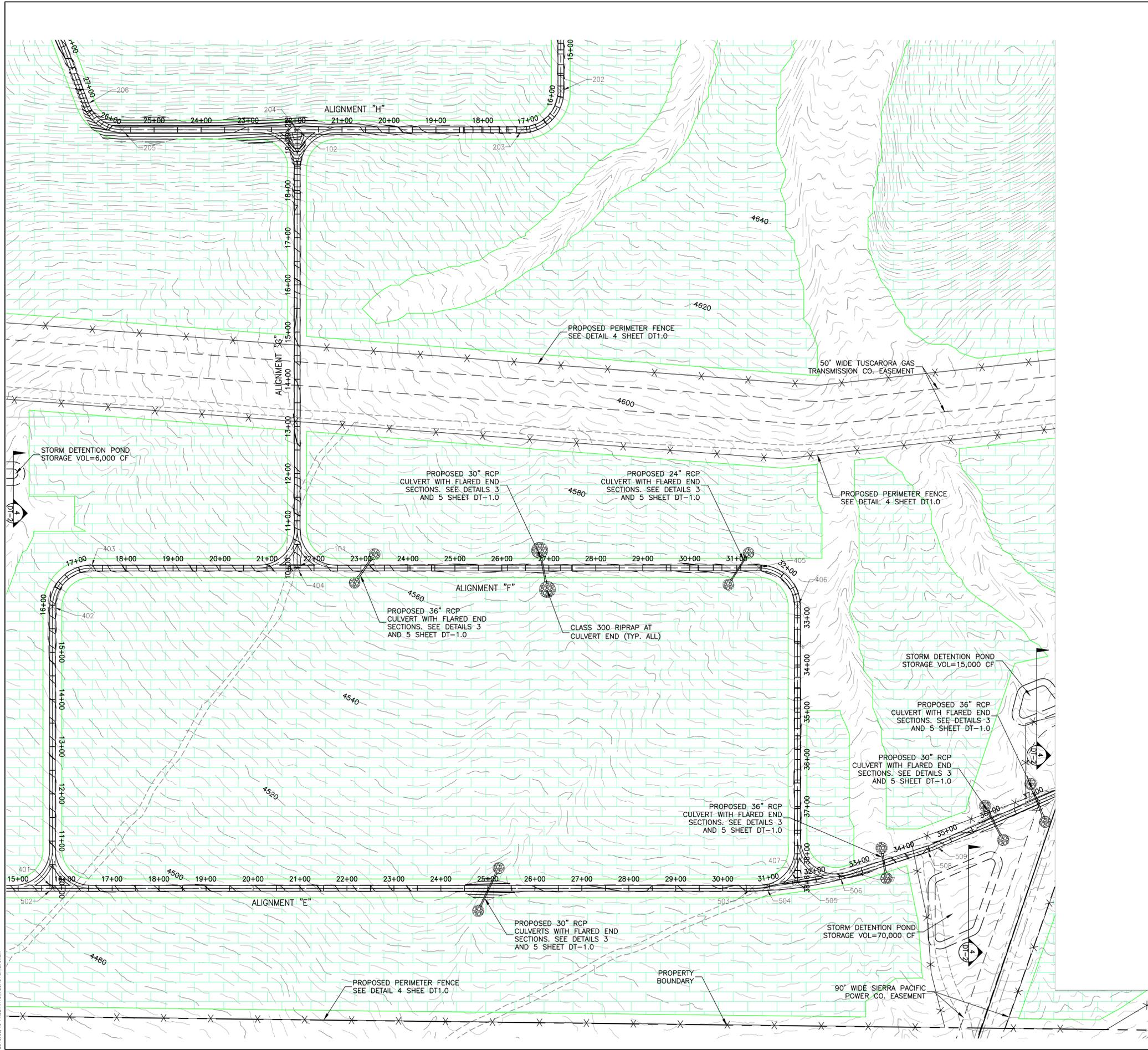
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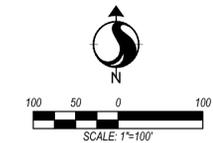
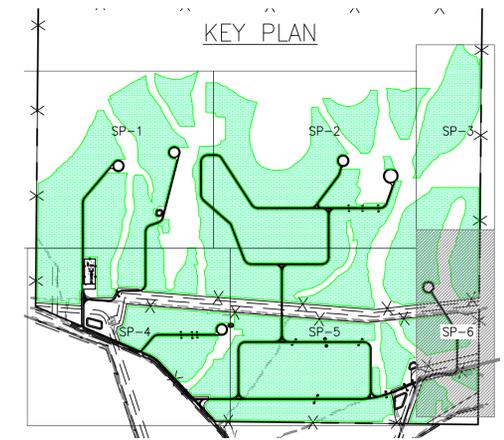
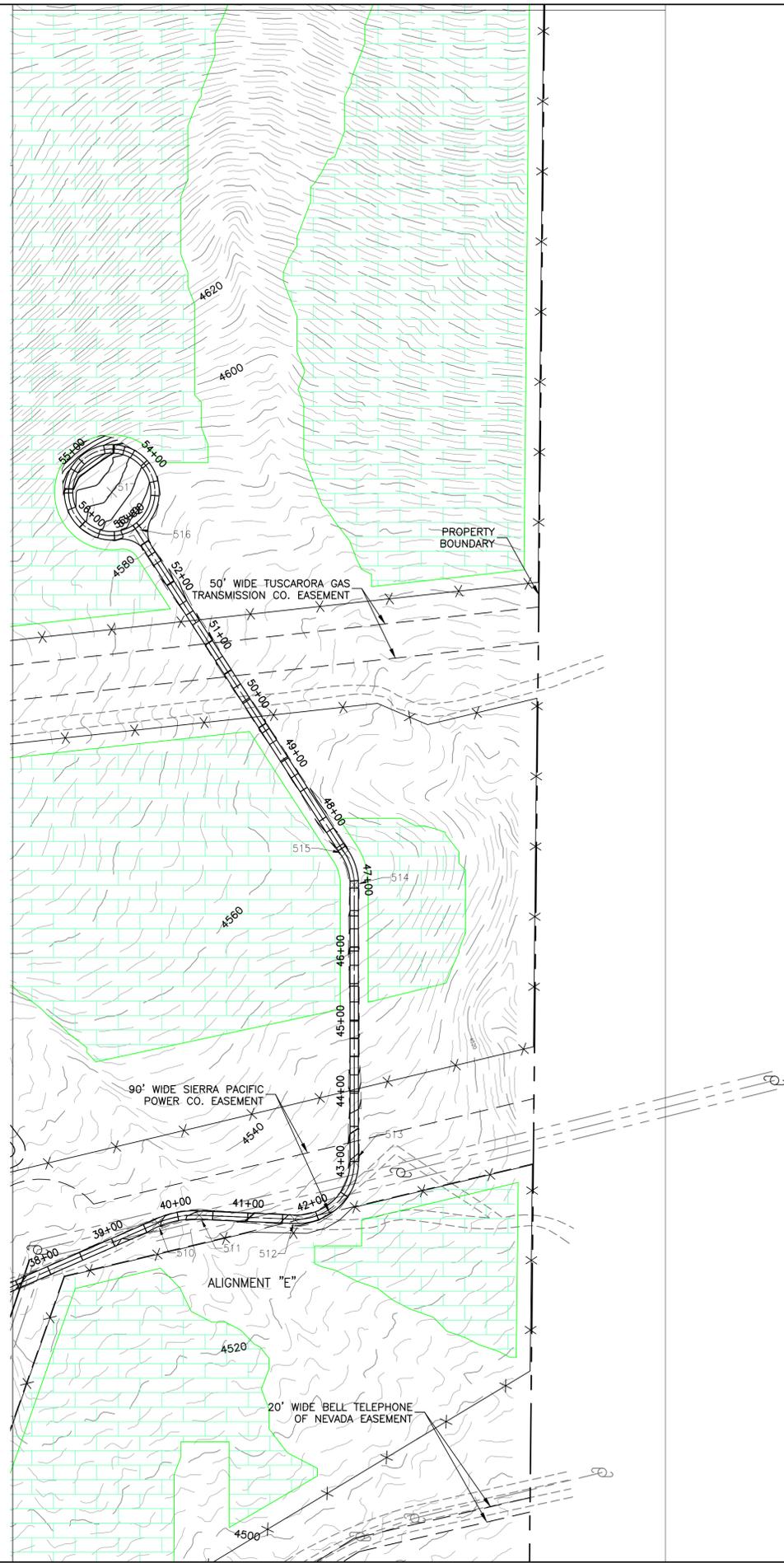
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Drawing No. **SG1.5**
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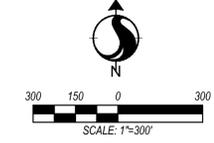
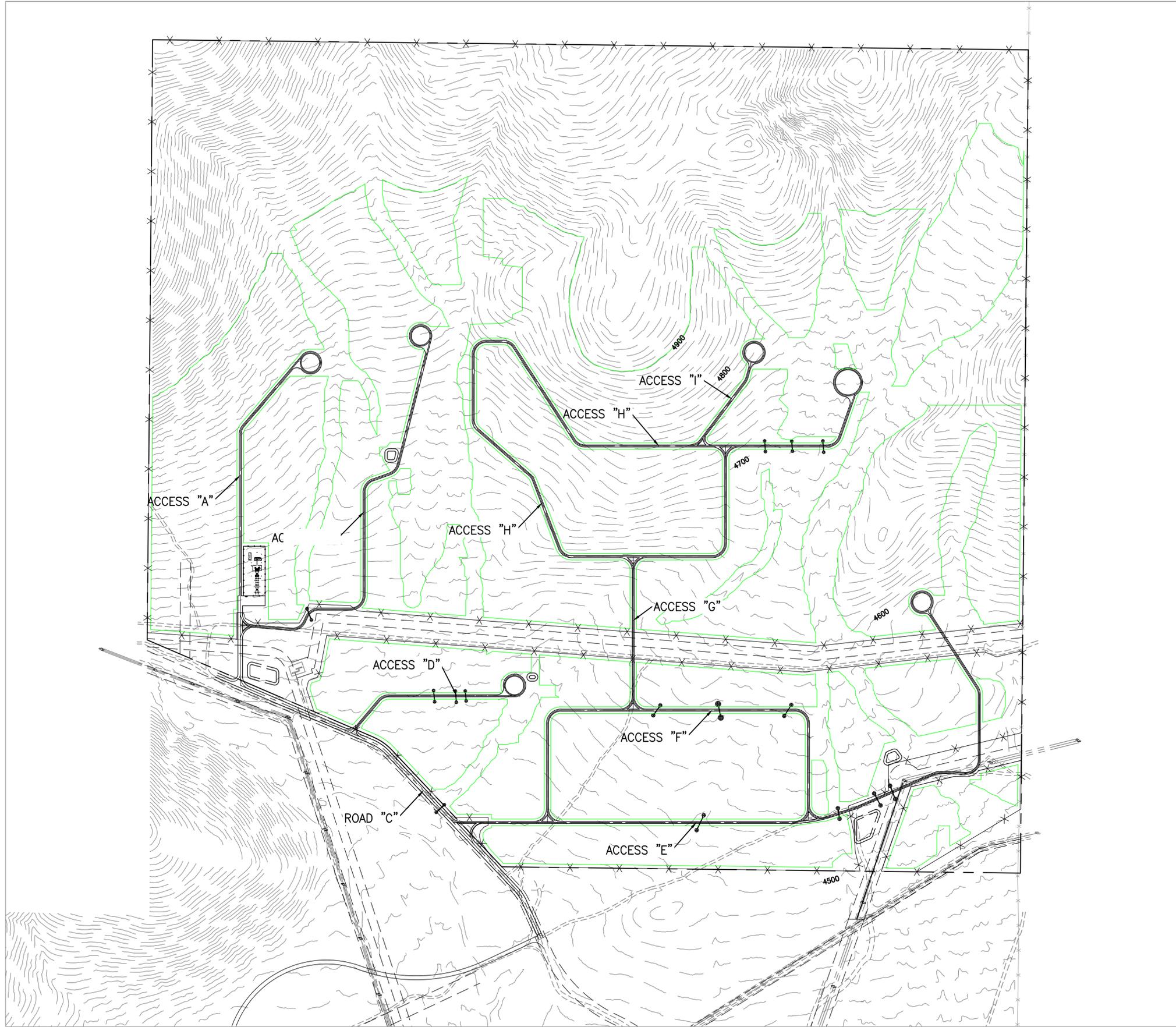
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Drawing No. **SG1.6**
Revision Sheet

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Revision	By	Appd.	Yr./M./D.D
1.	BME	jpo	15.05.15
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PROFILE KEY MAP



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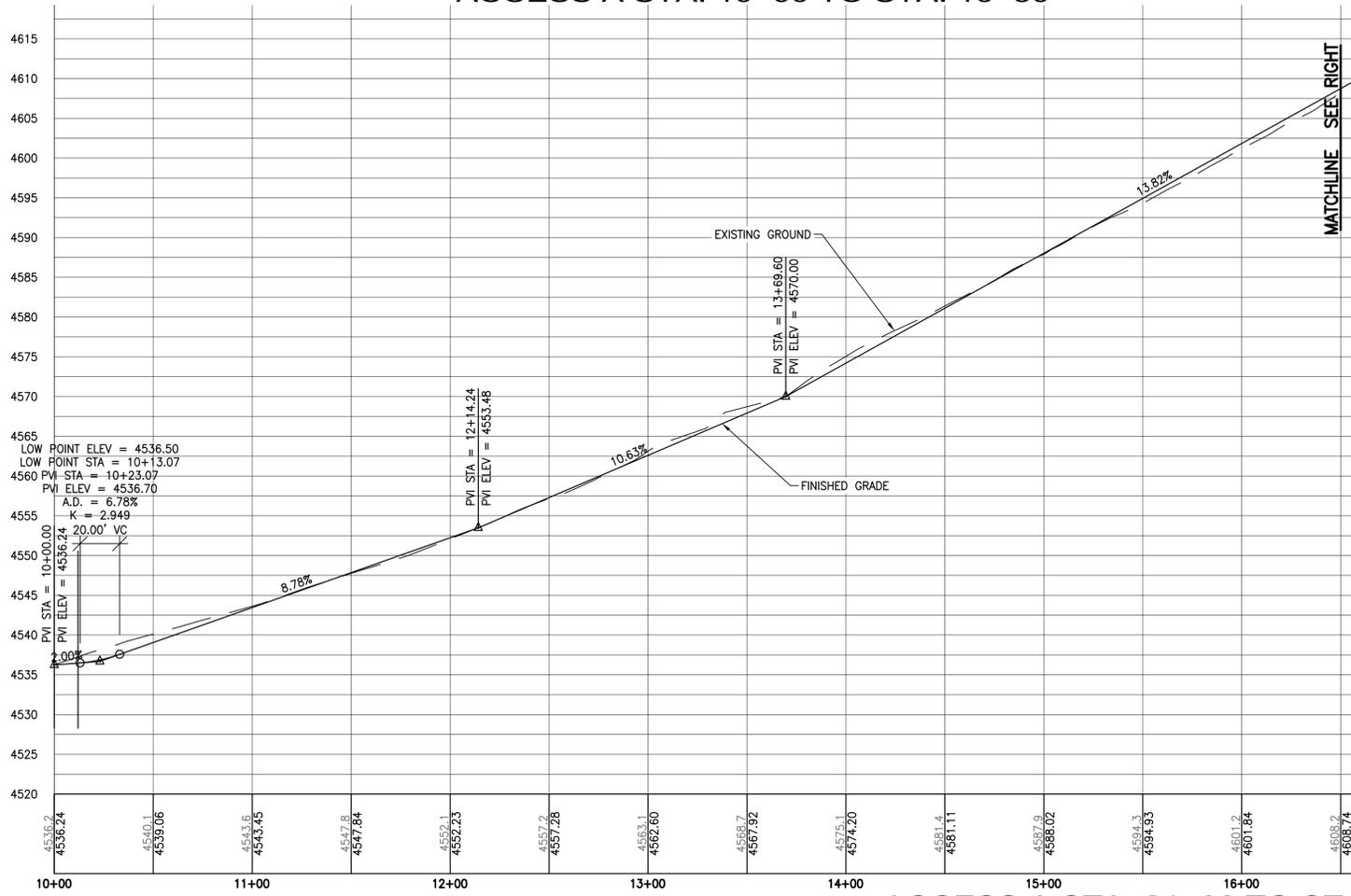
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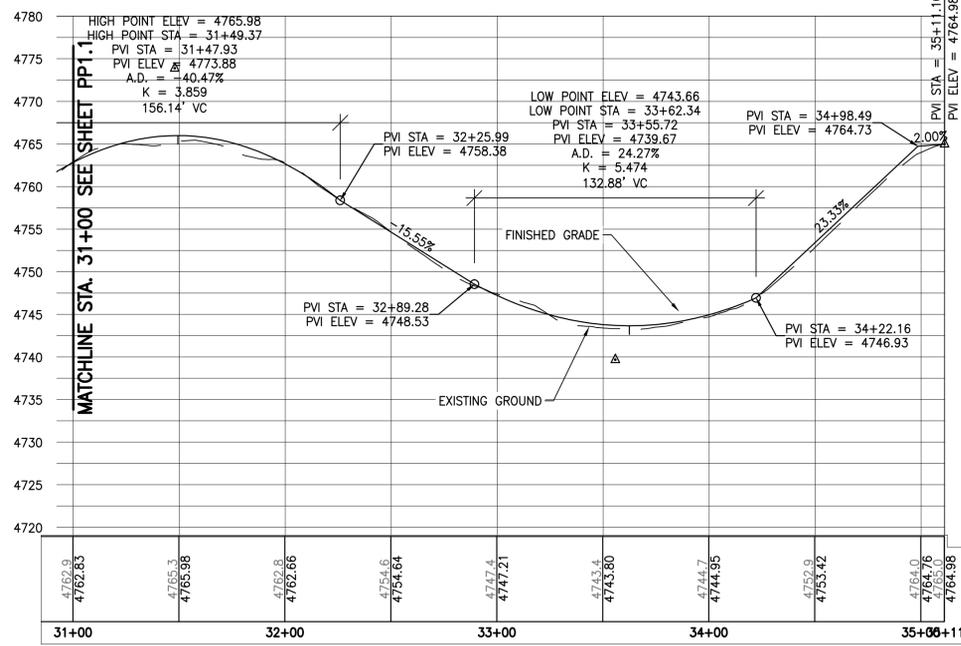
Drawing No. **PP1.0**
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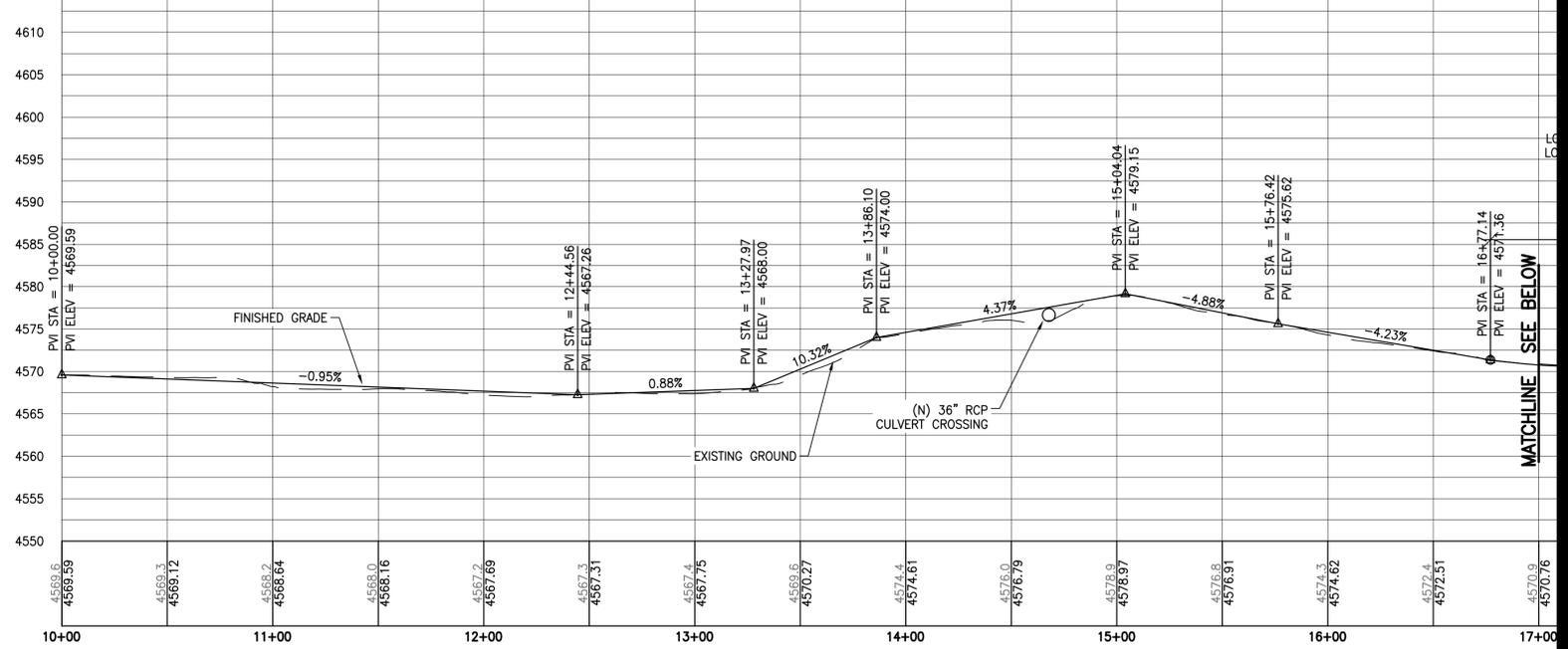
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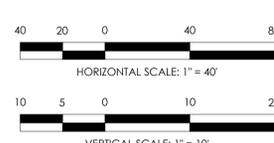
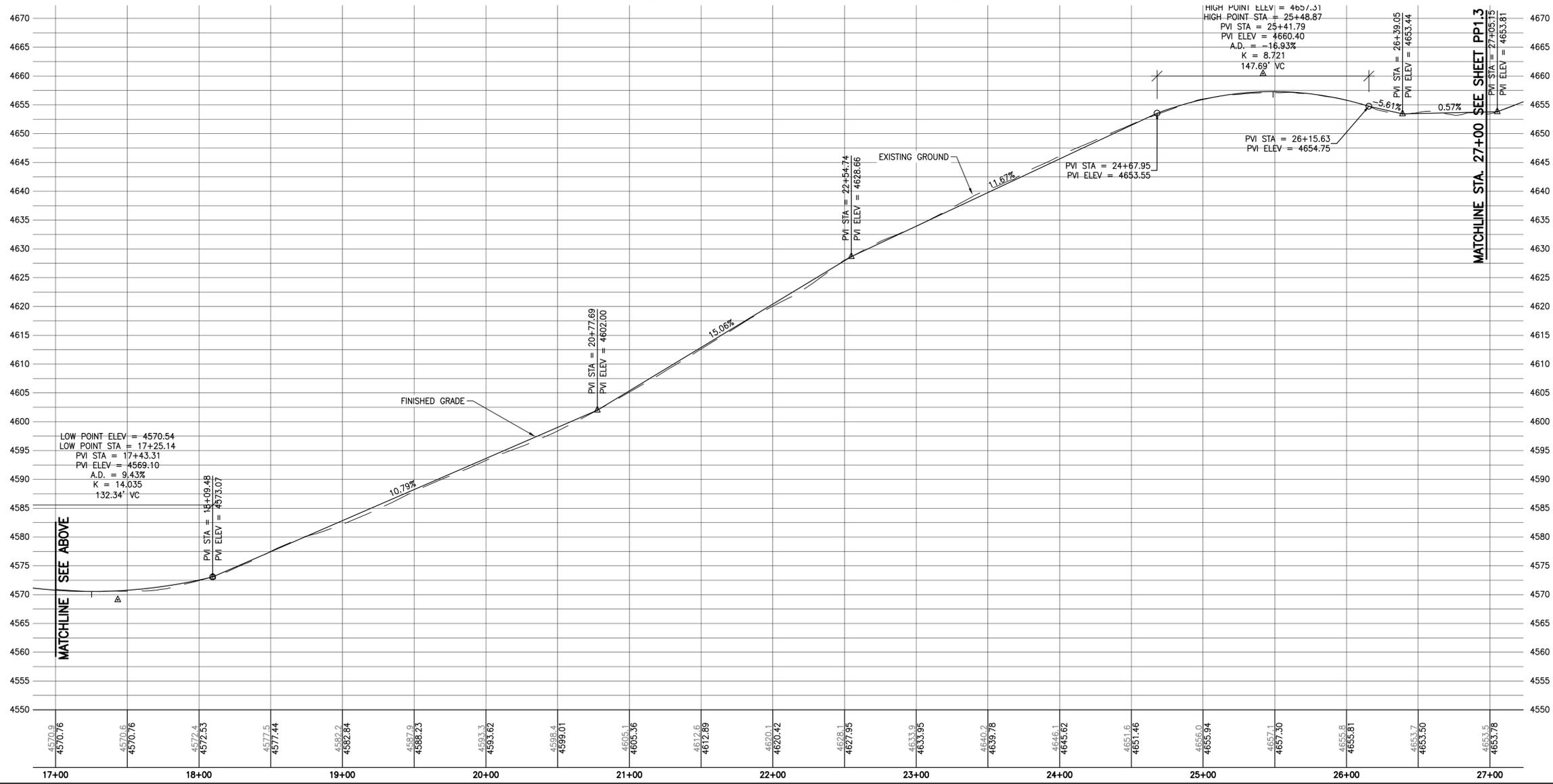
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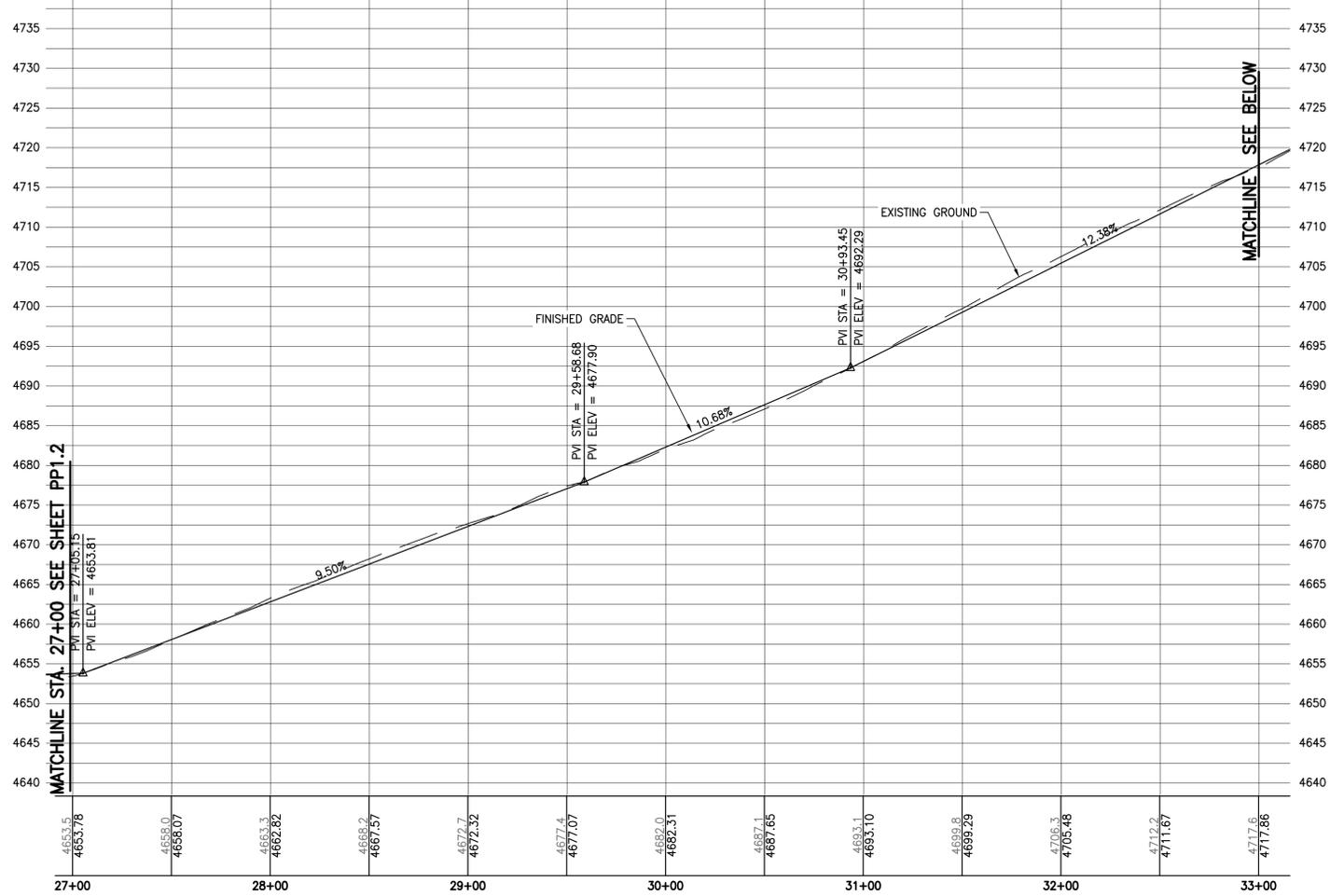


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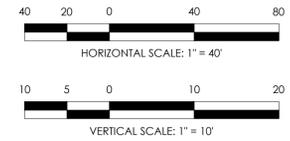
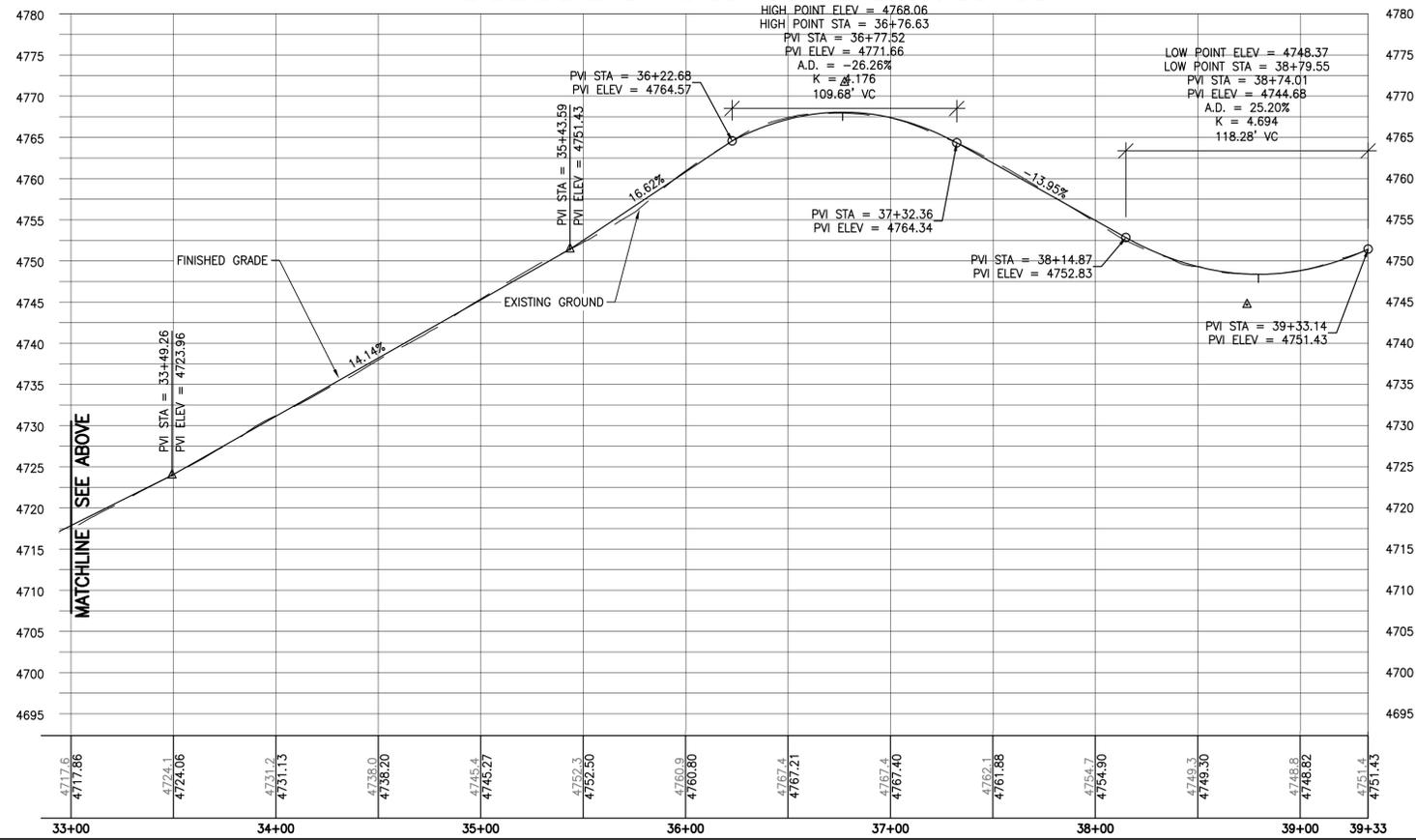
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2015/05/15 11:54 AM RRB\Esthercarria_Balon

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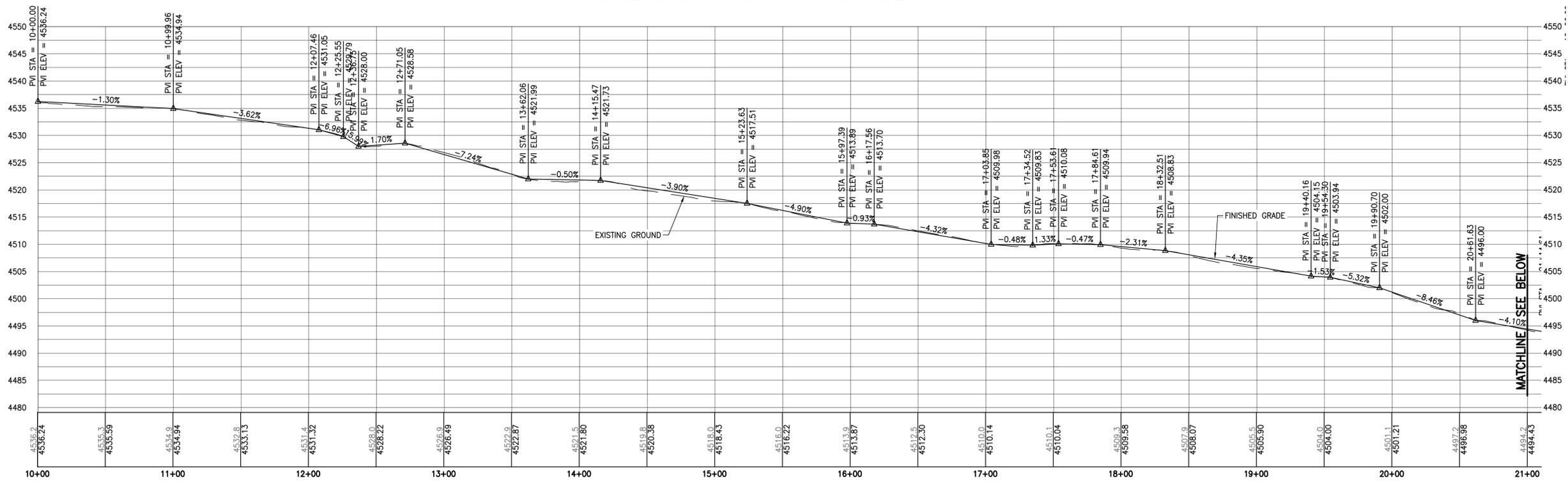
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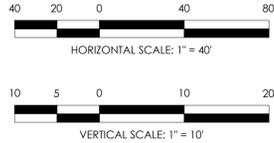
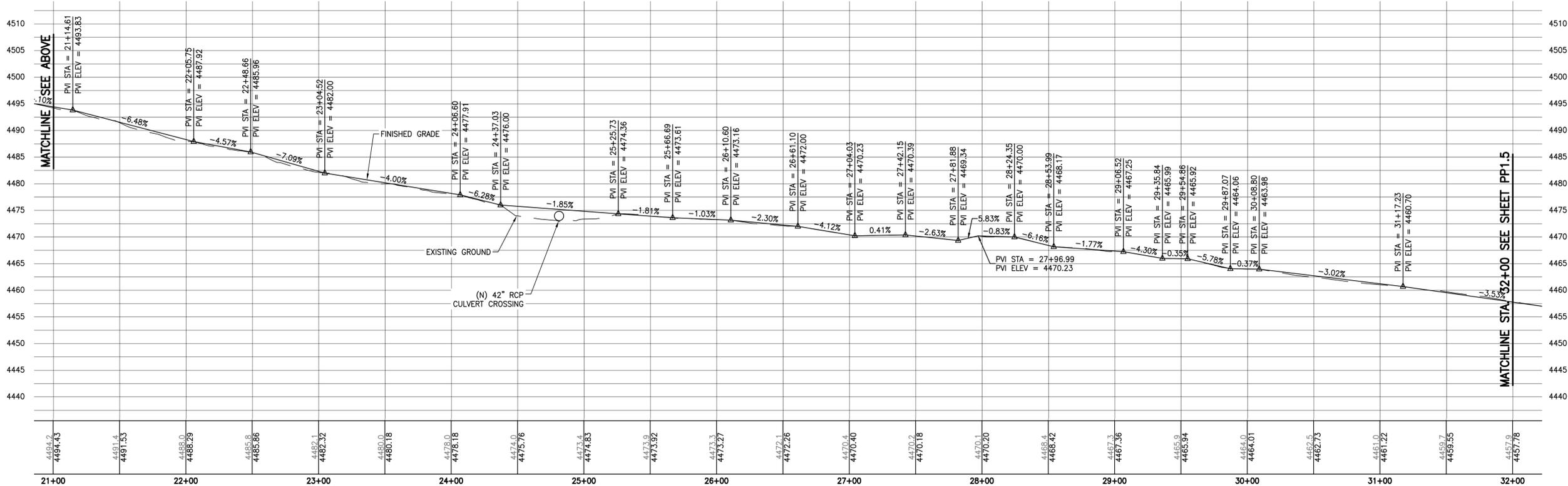
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ROAD C STA. 21+00 TO STA. 32+00



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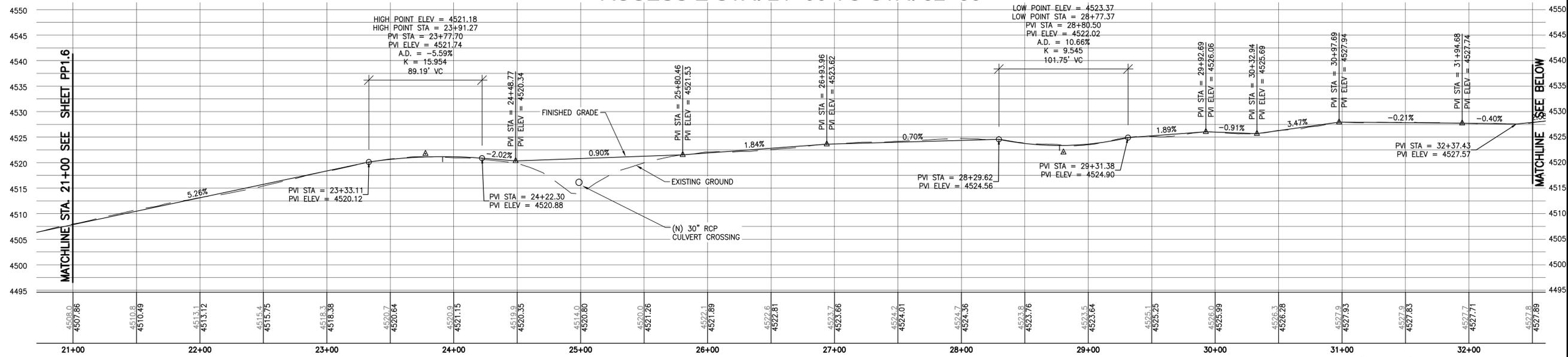
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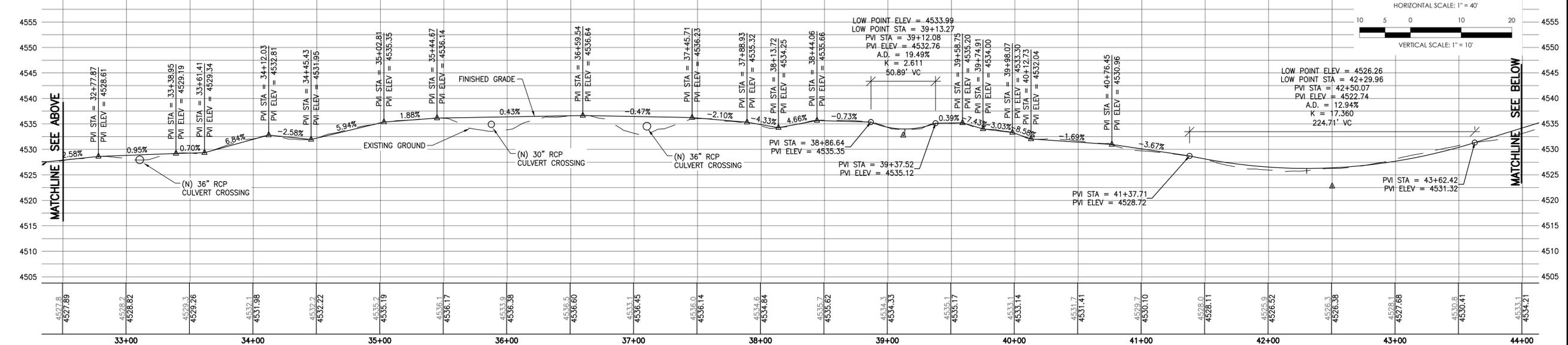
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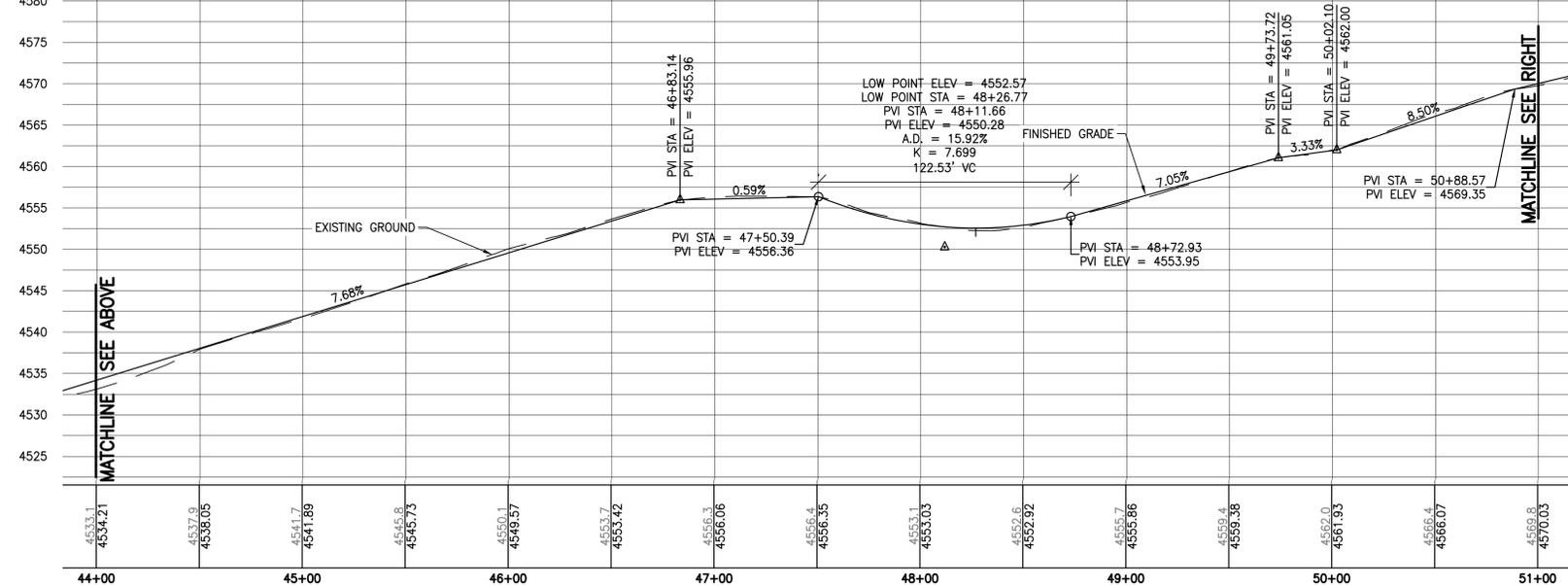
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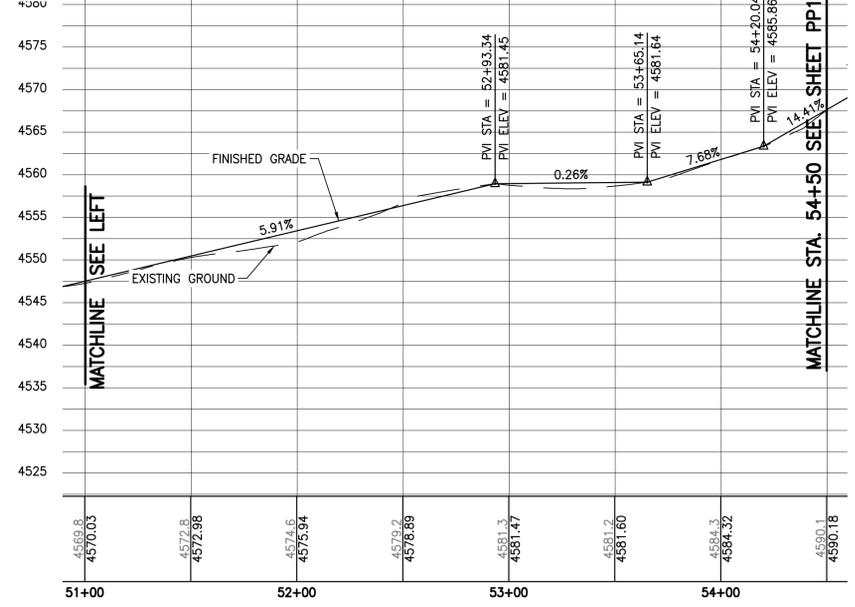
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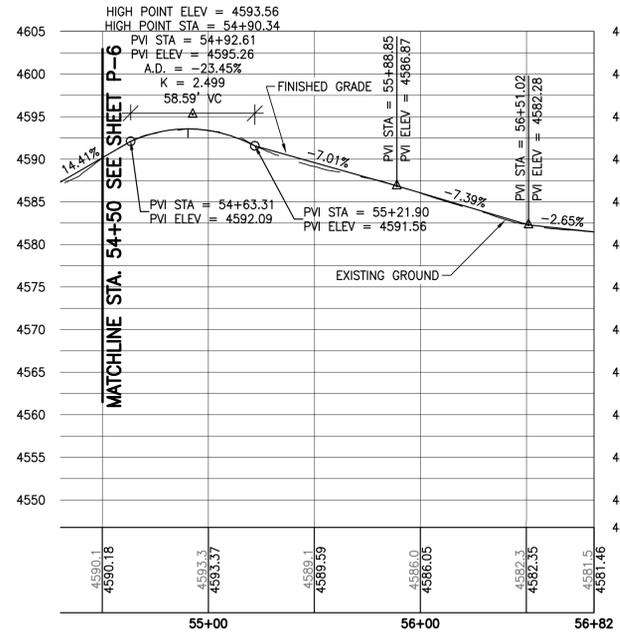
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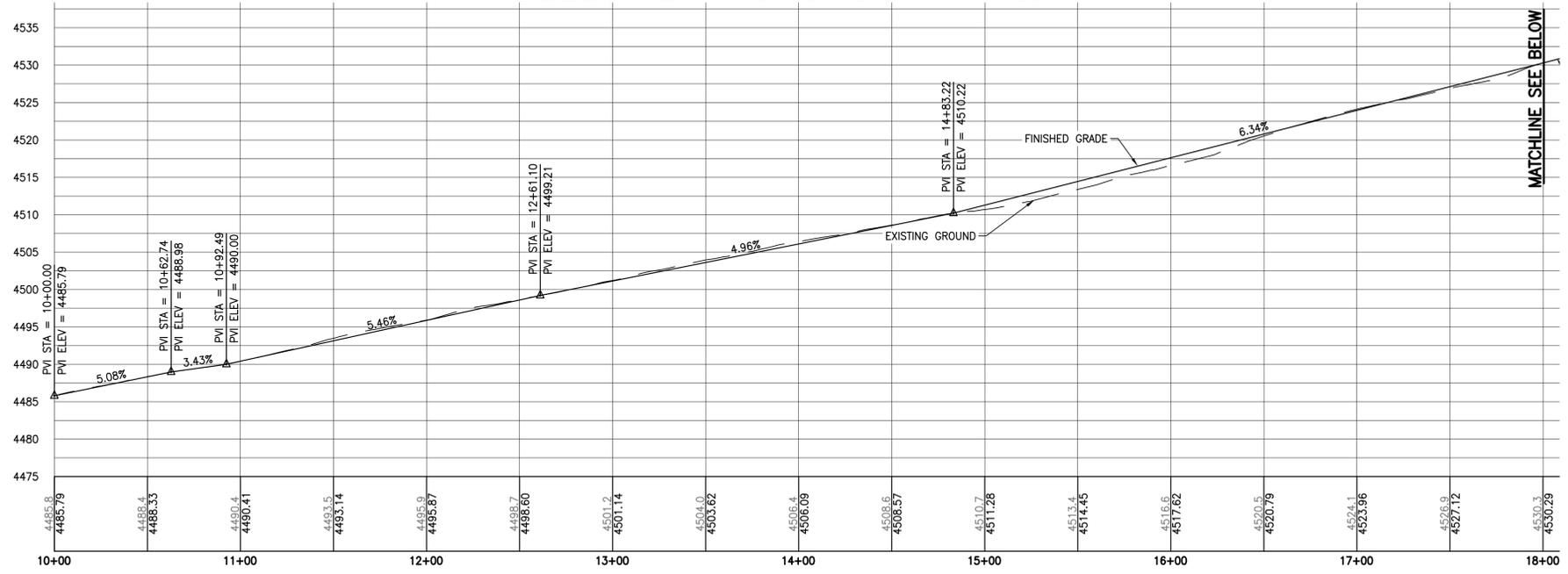
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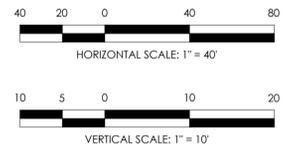
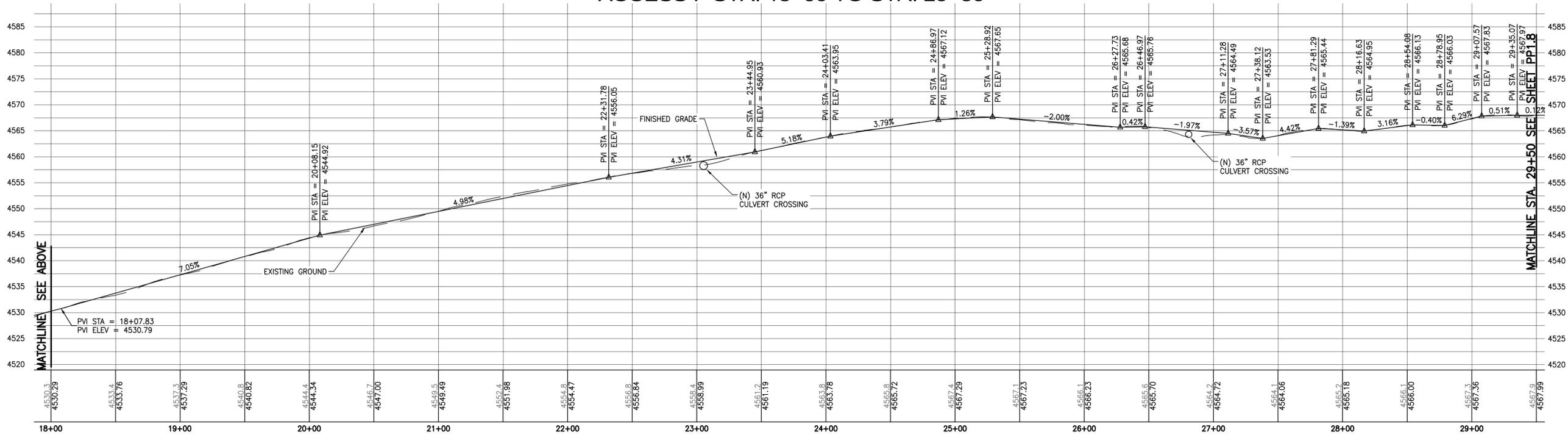
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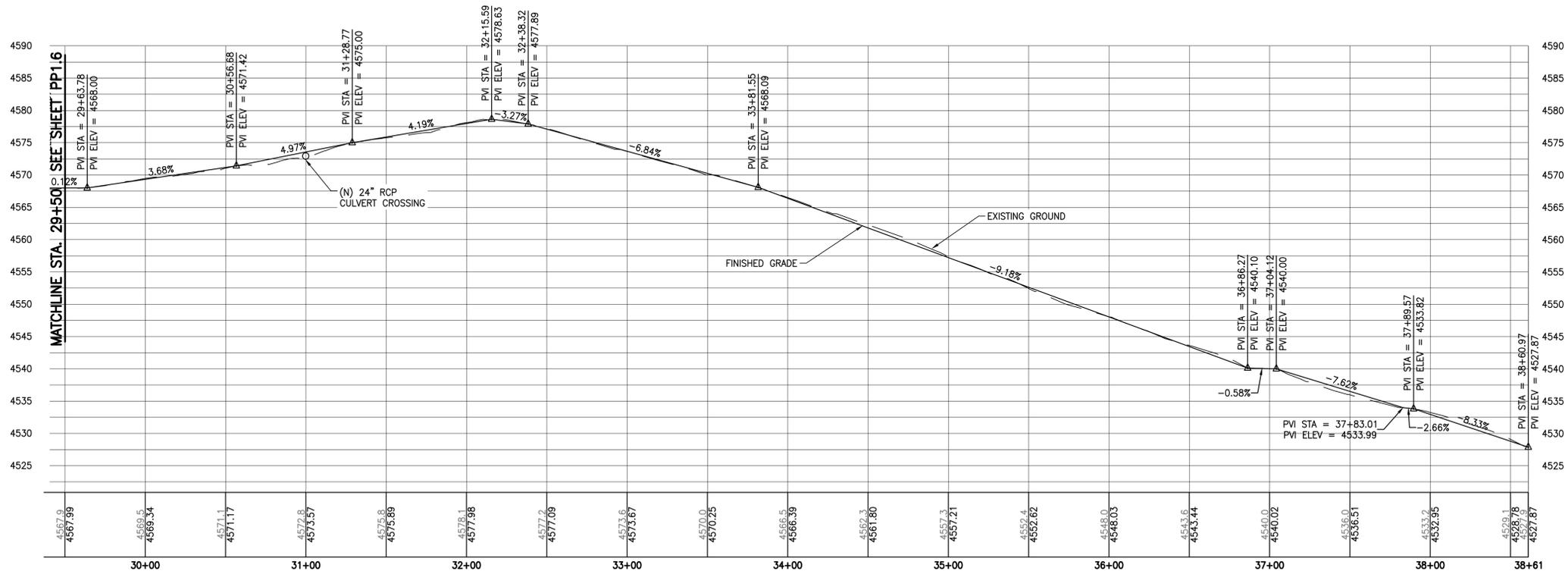
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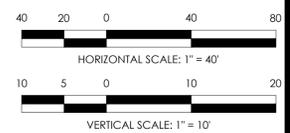
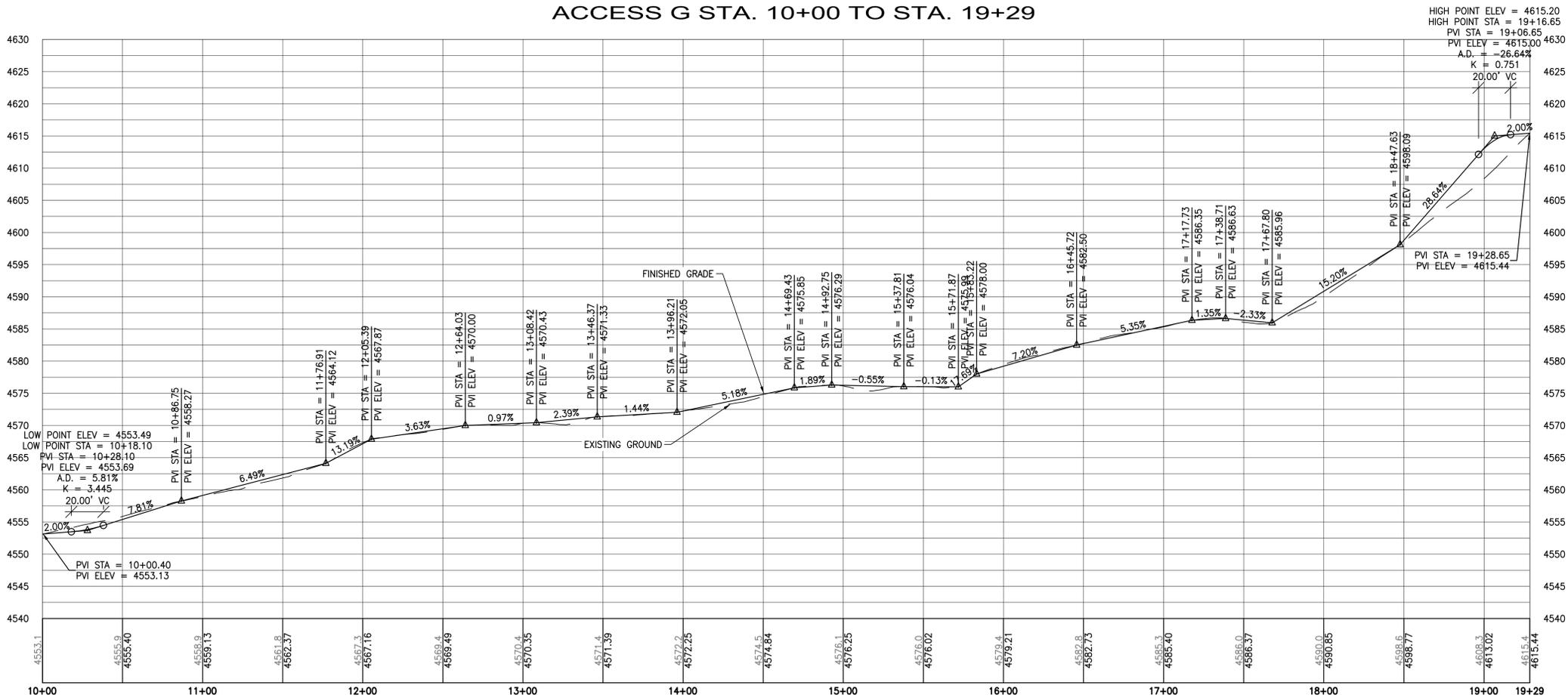
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Dwn Chkd. Dsgn. Yr./M/DD
Drawing No. PP1.7
Revision Sheet

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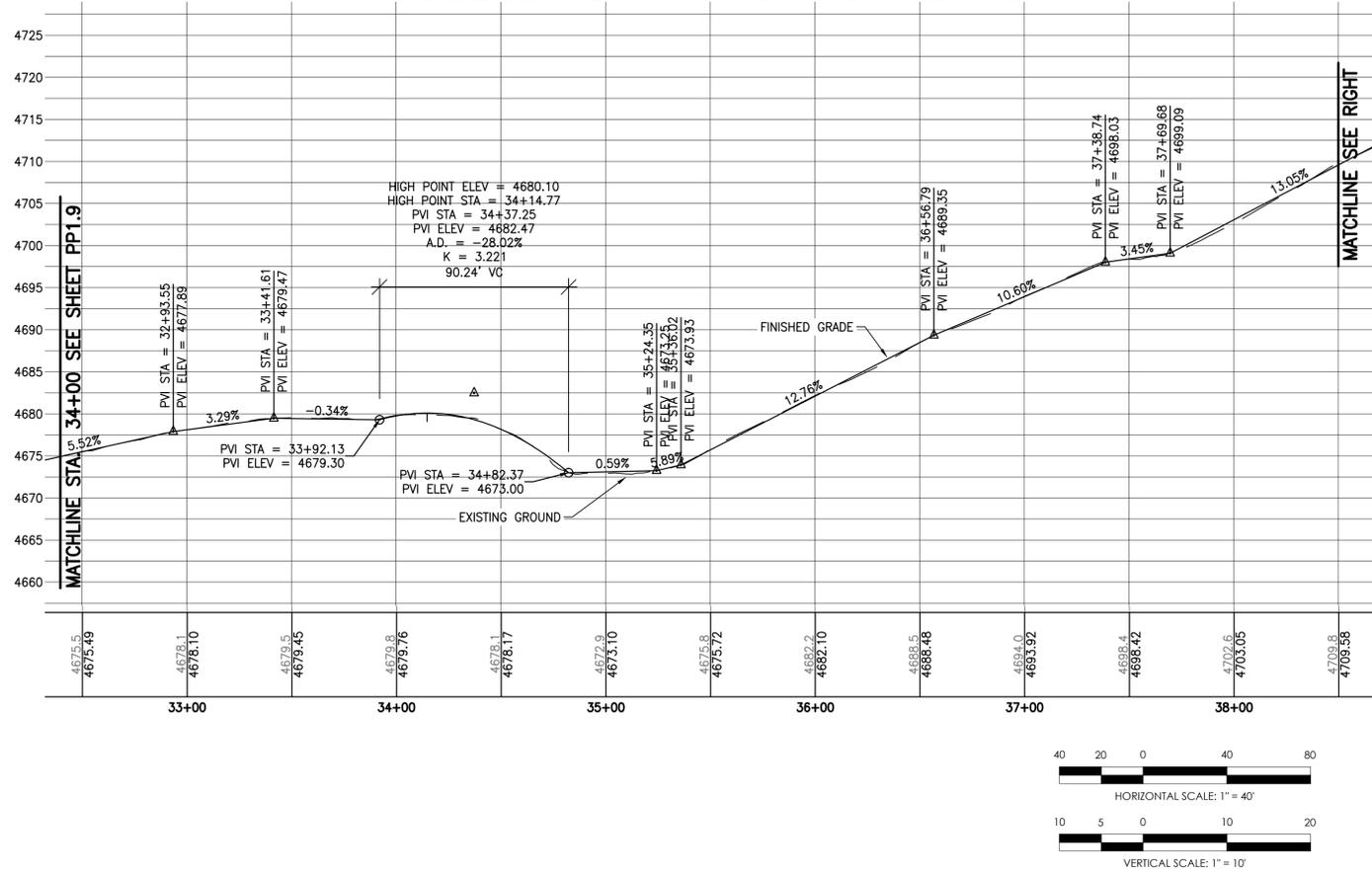
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File Name: 1351_acc_p-1.dwg
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Chkd: Dsgn. YY.MM.DD
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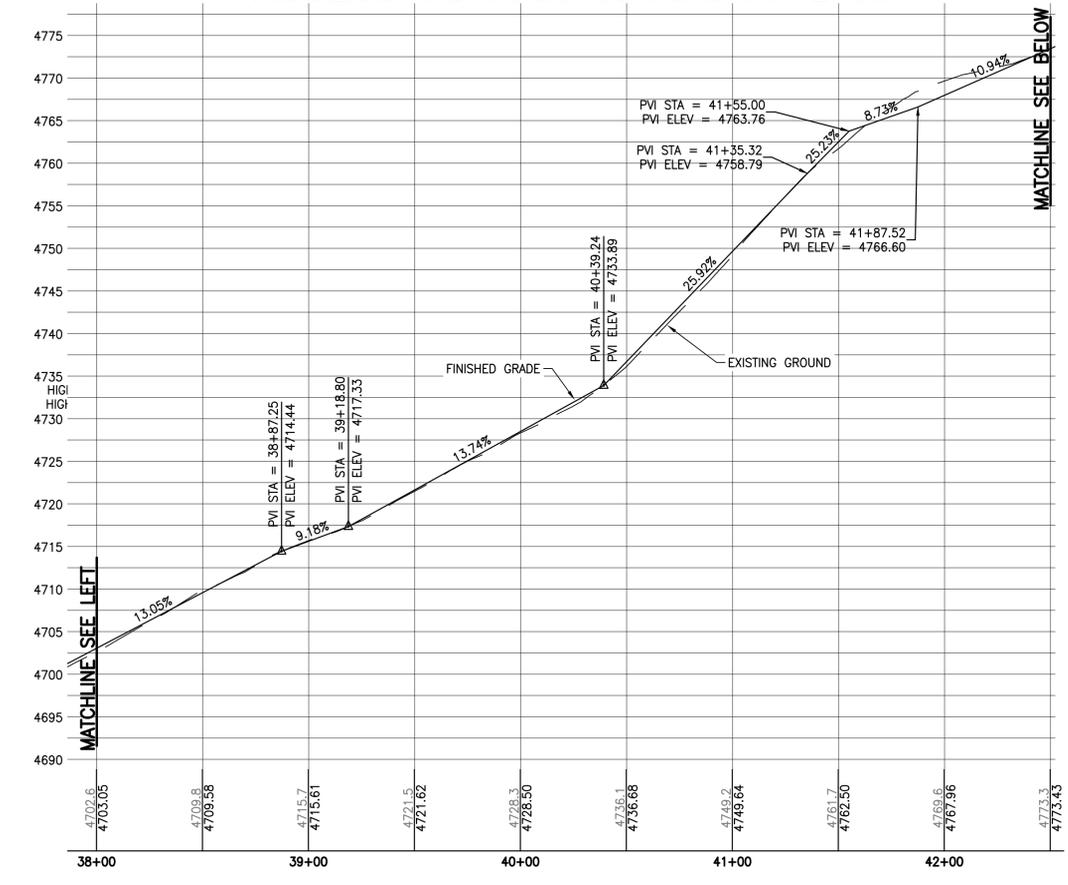
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1.	BME	jro	15.05.15
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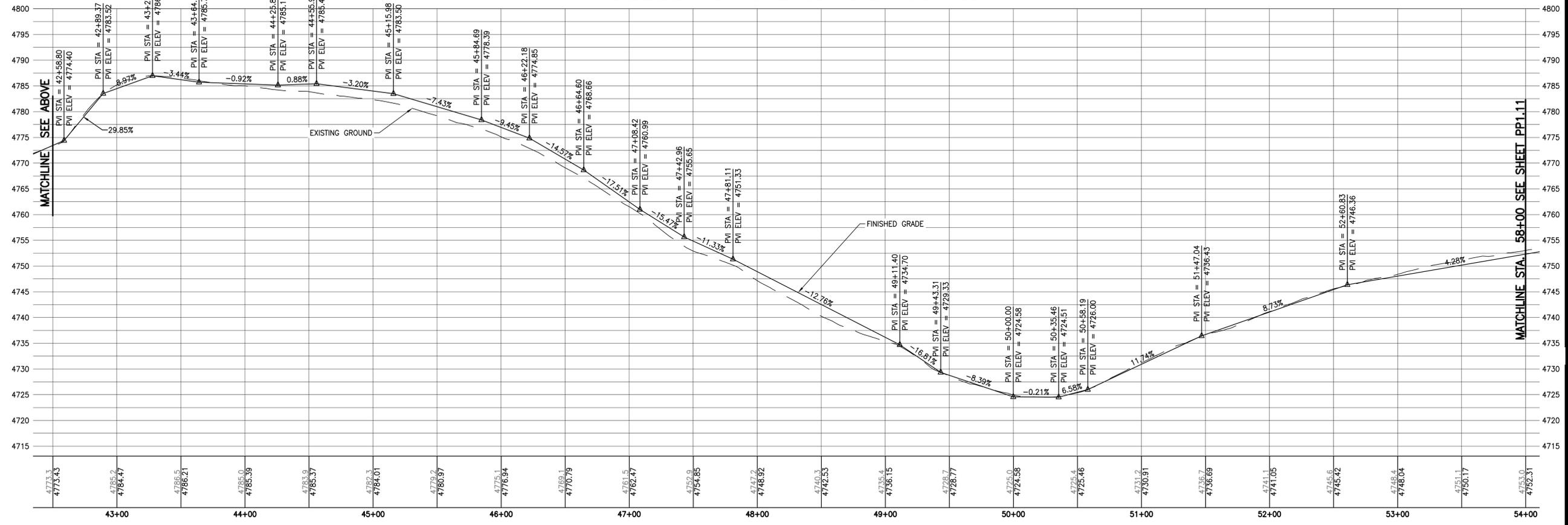
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ACCESS H STA. 38+00 TO STA. 42+50



ACCESS H STA. 42+50 TO STA. 54+00



Revision	By	Appd.	Yr./M/D
1.	SUP WASHOE COUNTY	BME	JIP
			15.05.15
			Yr./M/D
			Issued

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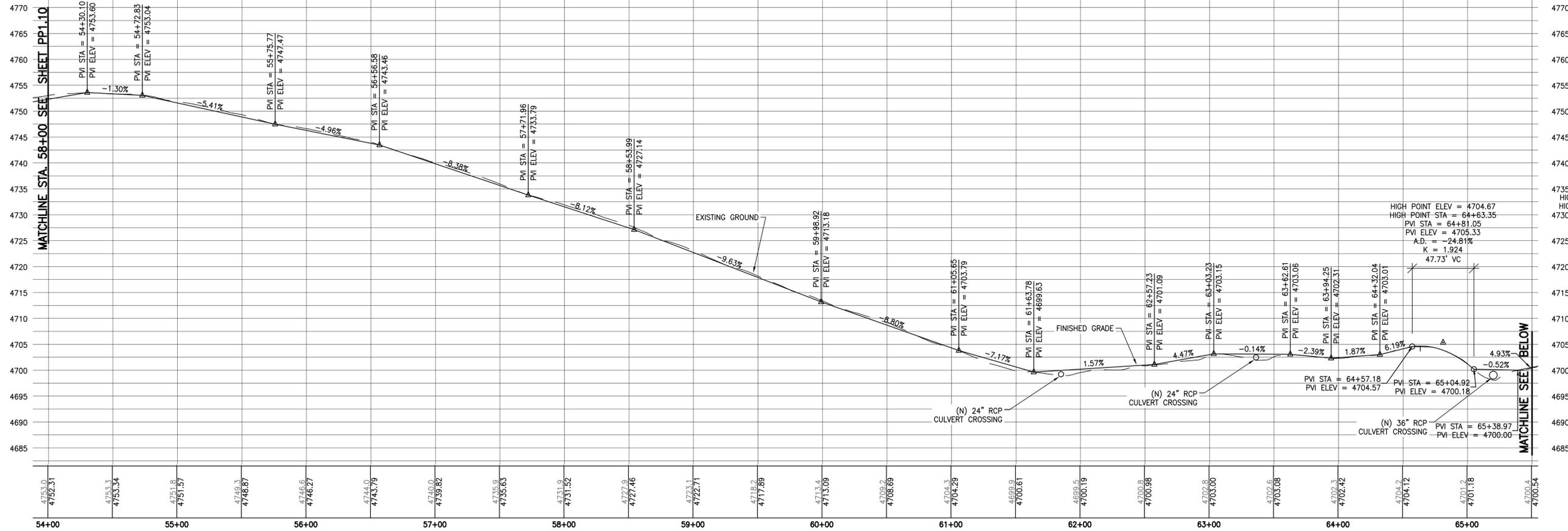
Client/Project
TURQUOISE SOLAR LLC.
60MW SOLAR PROJECT
Washoe County, Nevada
ACCESS H PROFILE STA. 34+00 TO STA. 54+00



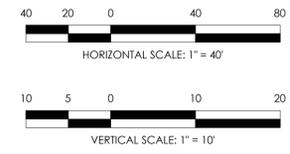
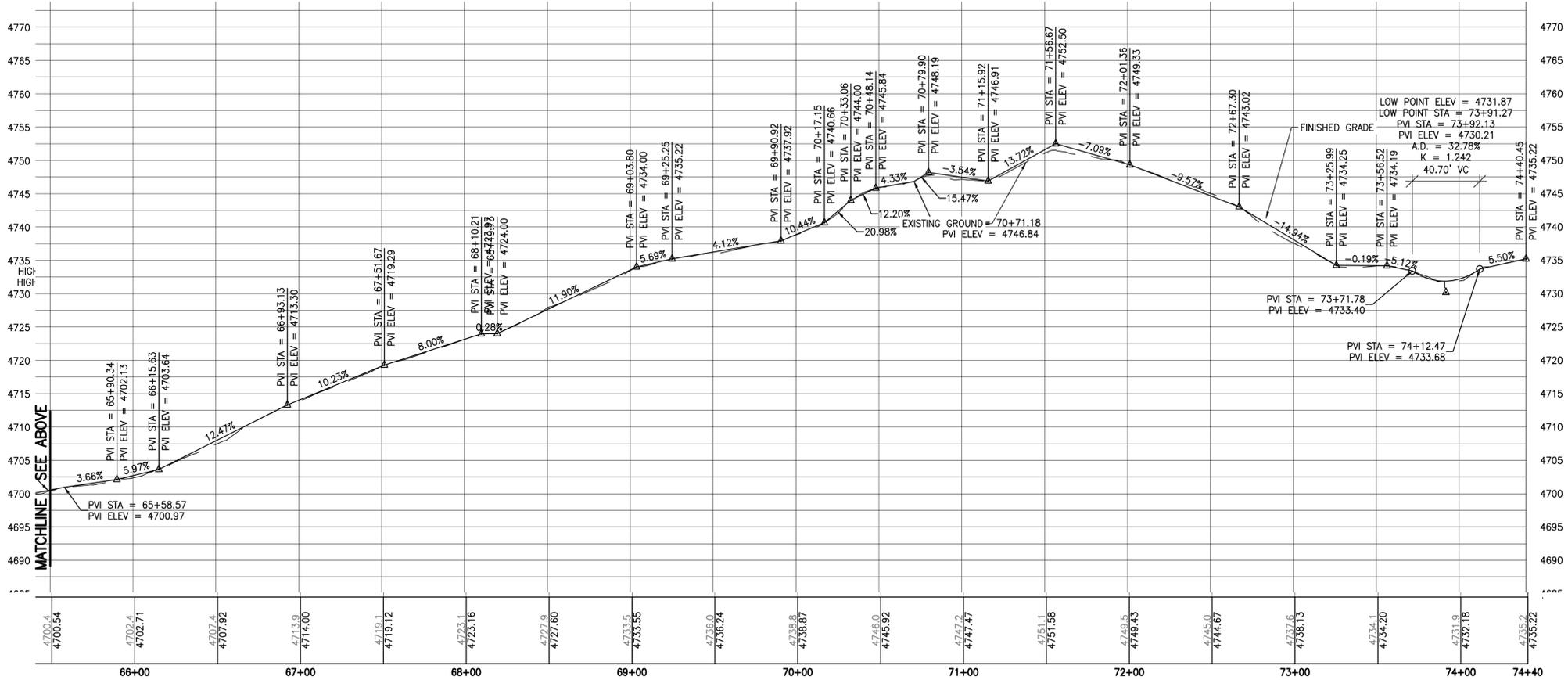
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PRELIMINARY NOT FOR CONSTRUCTION
30% SUBMITTAL
Project Number: 180101351
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BME RRB jip 15.04.14
Dwn Chkd Dsgn Yr./M/D
Drawing No. PP1.10
Revision Sheet

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2015.05.15 11:58 AM RJB, Echevarria, Babin

ACCESS H STA. 10+00 TO STA. 65+50



ACCESS H STA. 65+50 TO STA. 74+40



Revision	By	Appd.	Y/M/MD
1.	SUP	WASHOE COUNTY	15.05.15
	BME	JIP	15.05.15
		By	Appd.
			Y/M/MD

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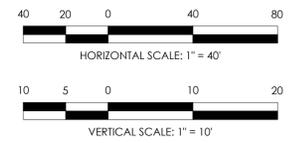
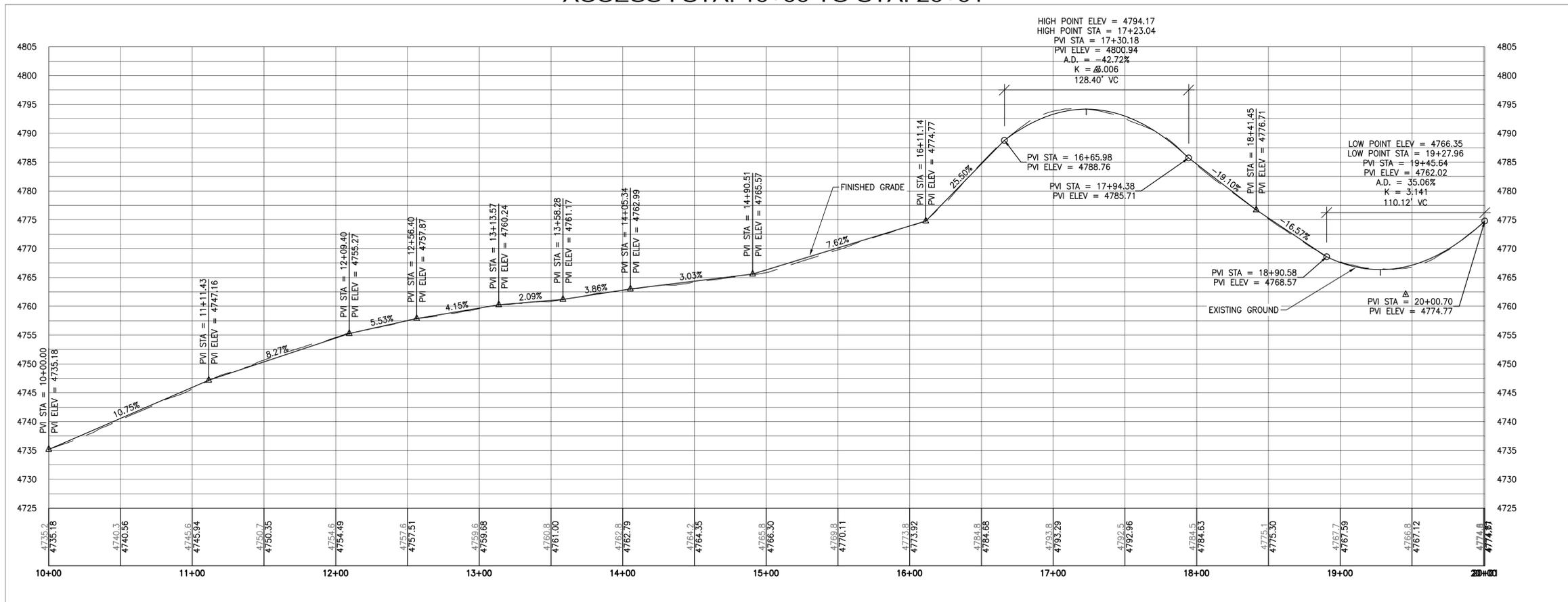
Client/Project
TURQUOISE SOLAR LLC.
60MW SOLAR PROJECT
Washoe County, Nevada

Permit Seal
PRELIMINARY
NOT FOR CONSTRUCTION
30% SUBMITTAL
15 MAY 2015

Project Number: 180101351
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BME RRB jip 15.04.14
Dwn Chkd. Dsgn. Y/M/MD
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Revision Sheet

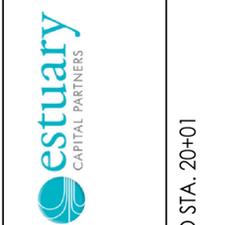
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ACCESS I STA. 10+00 TO STA. 20+01



Revision	By	Appd.	Yr.
1. SUP WASHOE COUNTY	BME	JJP	15.05.15
Issued			YY.MM.DD

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60MW SOLAR PROJECT
Washoe County, Nevada



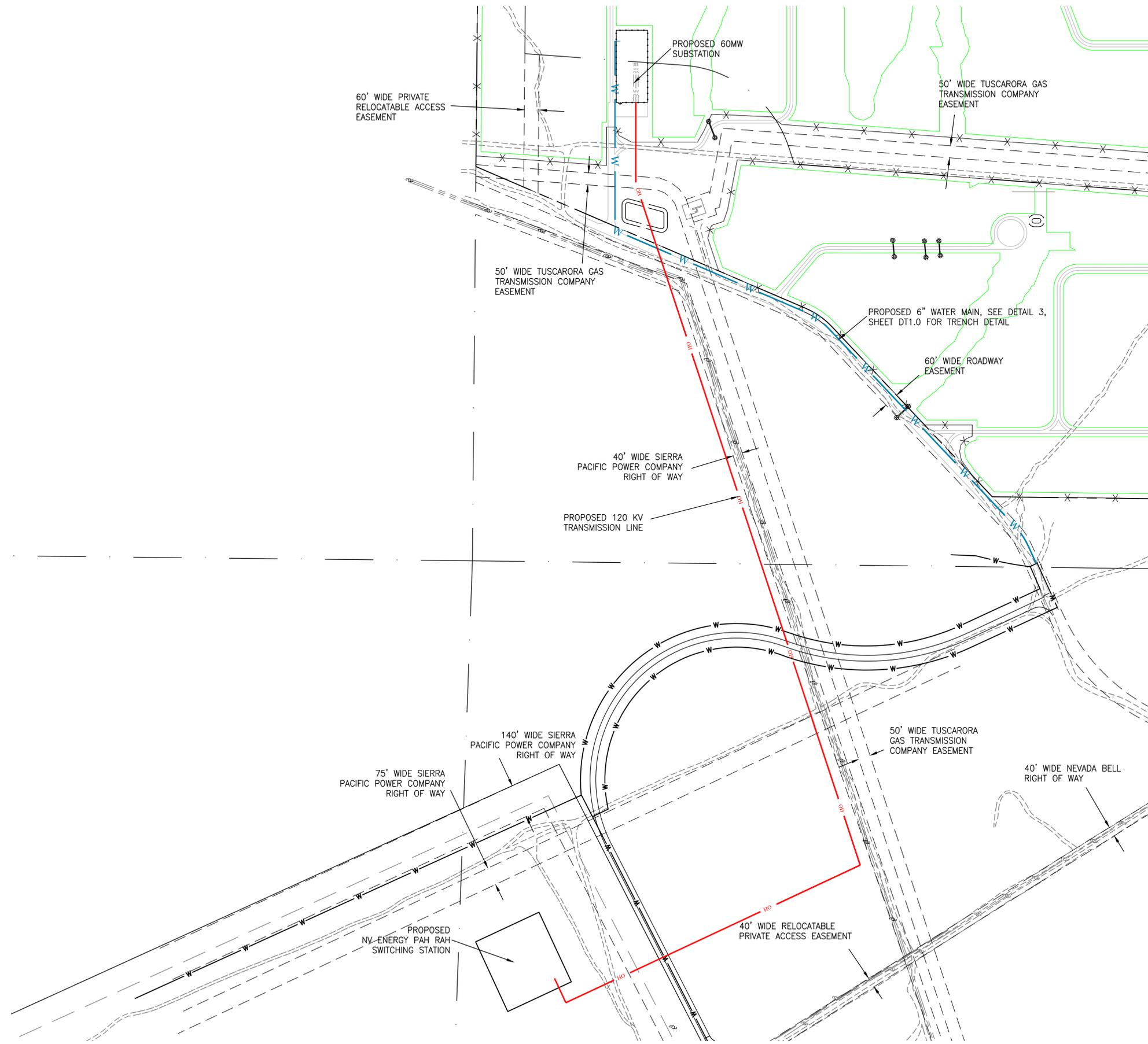
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Dwn.	Chkd.	Dsgn.	YY.MM.DD

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Revision Sheet

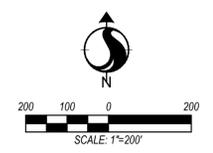
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2015/05/15 11:58 AM By: Eshwarima, aban

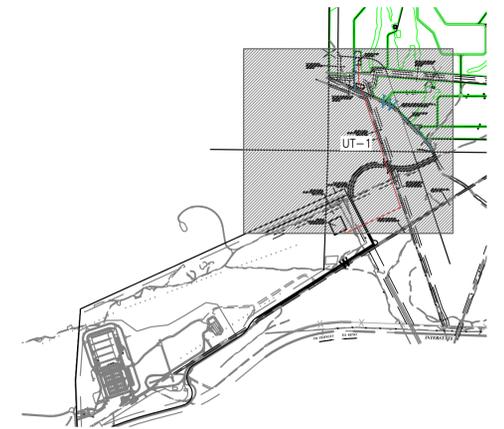


LEGEND

— W —	— EXISTING WATER MAIN
— W —	— PROPOSED 6" WATER MAIN
— OH —	— OVERHEAD ELECTRIC



KEY PLAN



Revision	By	Appd.	Y1.MM.DD
1.	BME	JJP	15.05.15
			Y1.MM.DD

By: BME
Appd.: JJP

1. SUP WASHOE COUNTY
By: BME
Appd.: JJP

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Client/Project
TURQUOISE SOLAR LLC.
60MW SOLAR PROJECT
Washoe County, Nevada
UTILITY PLAN

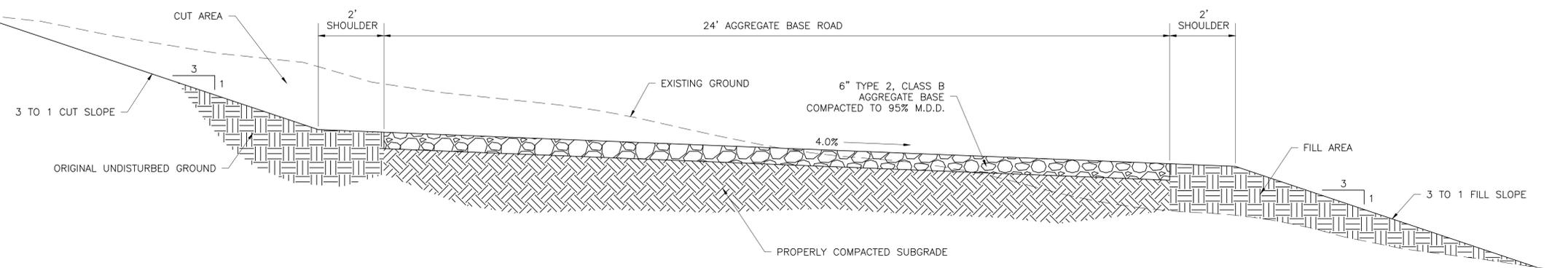
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30% SUBMITTAL

ENGINEER
PRINGLE
Exp. **31 DEC 15**
CIVIL
No. 20190
15 MAY 2015

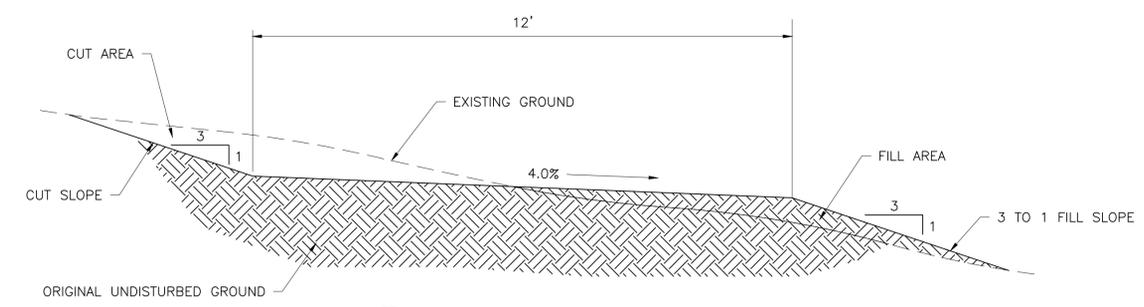
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BME	RRB	jpp	15.04.14
Dwn	Chkd.	Dsgn.	YY.MM.DD

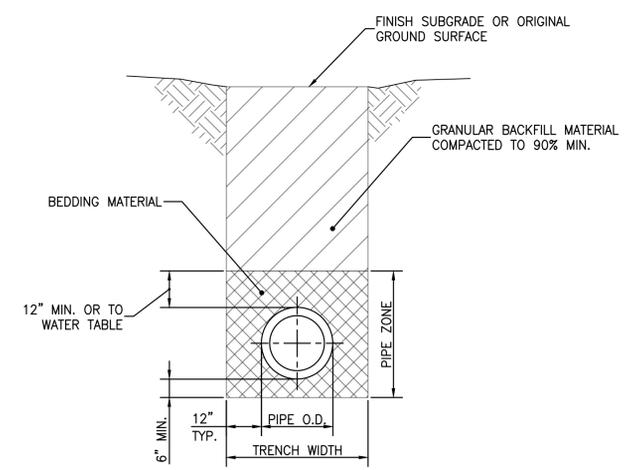
Drawing No. **UT1.0**
Revision Sheet
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1 RTP ROADWAY SECTION
DT-1 NTS



2 ALL TERRAIN VEHICLE ACCESS
DT-1 NTS

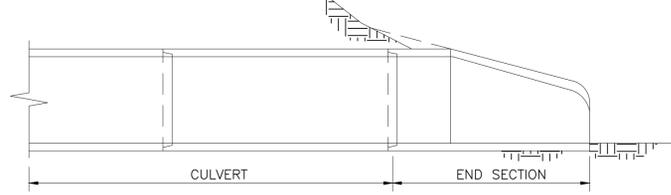
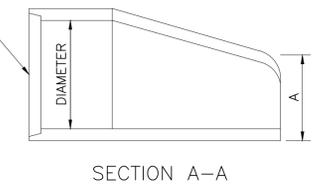
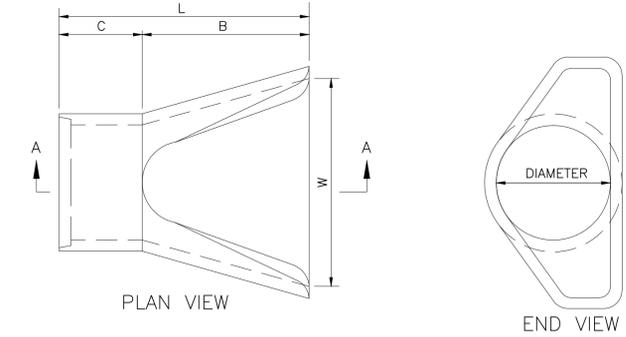


3 TYPICAL PIPE TRENCH DETAIL
DT-1 NTS

- NOTES:
1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST REVISION.
 2. BEDDING MATERIAL SHALL BE CLASS "A", "B", OR "C", COMPACTED TO 90% MINIMUM.
 3. ALL EXCAVATIONS SHALL CONFORM TO THE LATEST O.S.H.A. REQUIREMENTS. SHORING OR SLOPED CUT MAY BE NECESSARY.

DIAMETER	WEIGHT	A	B	C*	L	W
18"	670	9"	2'-1"	2'-1"	4'-2"	3'
24"	1300	9-1/2"	3'-6"	2'-6"	6'	4'
30"	1850	1'	4'-5"	1'-8"	6'-1"	5'
36"	3500	1'-3"	5'-2"	2'-11"	8'-1"	6'
42"	4930	1'-9"	5'-3"	2'-11"	8'-2"	6'-2"
48"	6700	2'	6'	2'-2"	8'-2"	7'
54"	7150	2'-3"	5'-6"	2'-9"	8'-3"	6'-10"

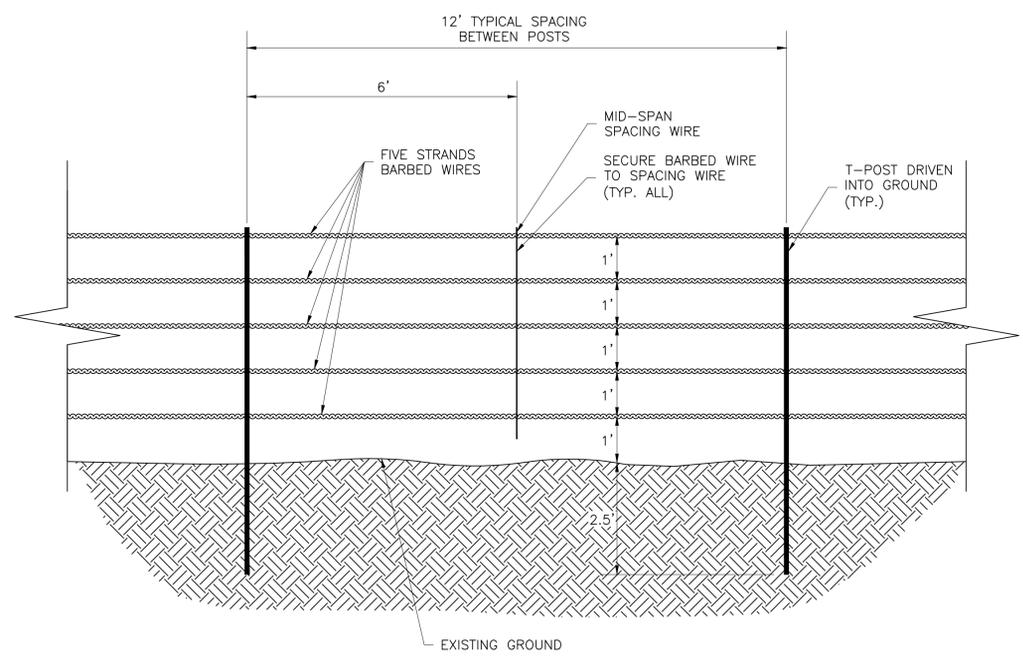
* FOR REFERENCE ONLY



CROSS SECTION VIEW
18" RCP TO 54" RCP

5 NDOT DETAIL - RCP END SECTION - 18" TO 54"
DT-1 NTS

- NOTES:
1. CLASS AND TYPE OF CONCRETE SHALL BE AS SPECIFIED FOR REINFORCED CONCRETE PIPE.
 2. STRUCTURAL DESIGN OF END SECTION SHALL CONFORM TO THAT OF STANDARD REINFORCED CONCRETE CULVERT PIPE.
 3. LENGTH OF PIPE SHOWN ON THE DESIGN PLANS DOES NOT INCLUDE CONNECTOR SECTION (LENGTH C).
 4. CONTACT HYDRAULICS ENGINEER FOR SIZES NOT LISTED.
 5. ACTUAL DIMENSIONS OF END SECTIONS MAY VARY BY MANUFACTURER. ADJUST PIPE LENGTHS AS NECESSARY TO ACCOMMODATE PRECAST END SECTIONS USED. SEE SHEETS R-1.1.2 FOR EXTENSION BEYOND FILL SLOPE AND PIPE PAY LENGTHS.



4 PERIMETER FENCE DETAIL
DT-1 NTS

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1.	BME	JJP	15.05.15
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60MW SOLAR PROJECT
Washoe County, Nevada

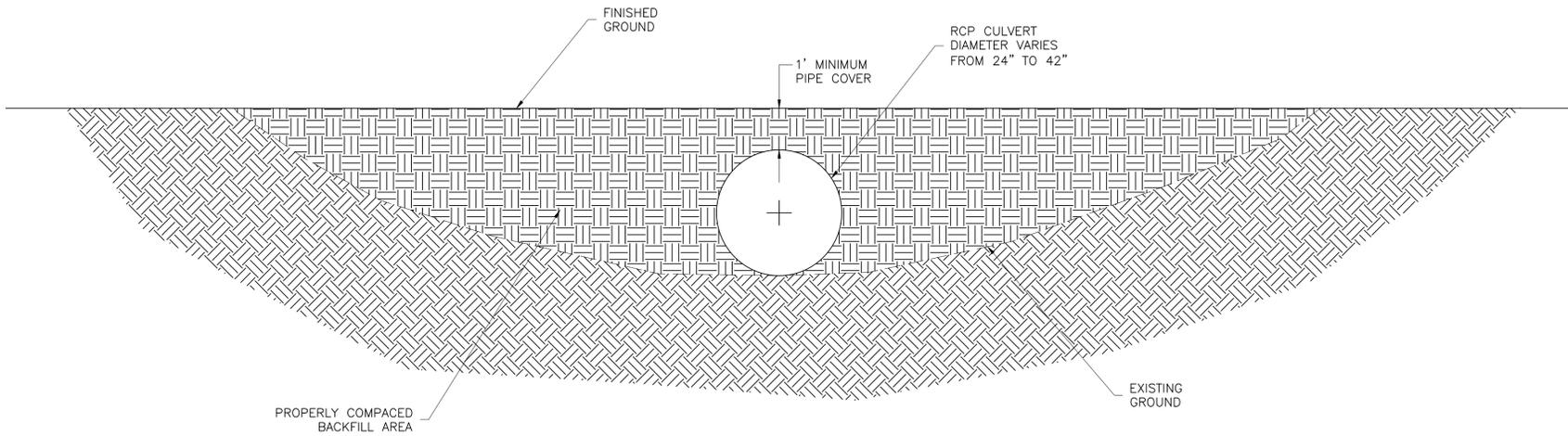
DETAILS

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30% SUBMITTAL
15 MAY 2015

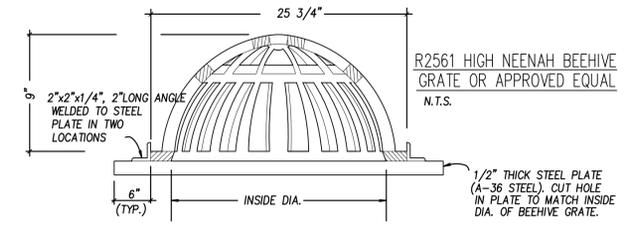
Project Number: 180101351
File Name: 1351_eccp_dtl-1.dwg

BME	RRB	JJP	15.04.14
Dwn.	Chkd.	Dsgn.	YY.MM.DD

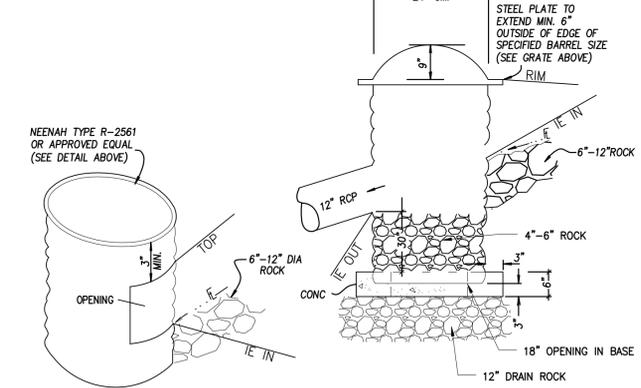
Drawing No. DT1.0
Revision Sheet



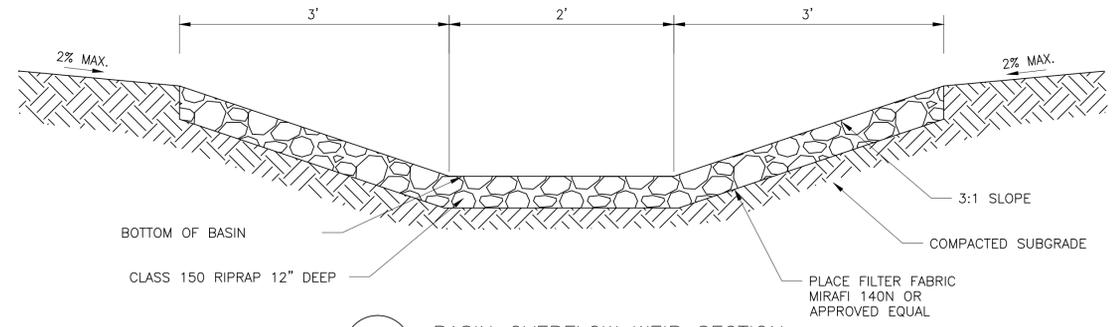
1 TYPICAL CULVERT SECTION DETAIL
DT-2 NTS



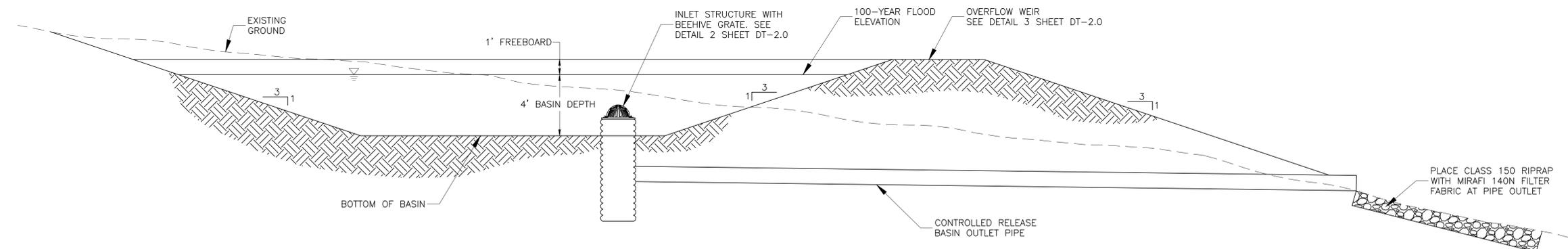
NOTE: OUTLET PIPE & BARREL SIZES TO BE DETERMINED BY ENGR. NOT FOR USE WITHIN ROADWAY SEC.



2 DETENTION BASIN OUTLET STRUCTURE
DT-2 NTS



3 BASIN OVERFLOW WEIR SECTION
DT-2 NTS



4 TYPICAL DETENTION BASIN SECTION WITH OUTLET STRUCTURES
DT-2 NTS



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Reno, NV 89511
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Client/Project
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60MW SOLAR PROJECT
Washoe County, Nevada
DETAILS



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NOT FOR CONSTRUCTION
30% SUBMITTAL
Project Number: 180101351
File Name: 1351_eccp_dtl-1.dwg
BME RRB jpp 15.04.14
Dwn Chkd. Dsgn. YY.MM.DD
Drawing No. DT2.0
Revision Sheet
0 27 of 27

Appendix A. Proof of Property Taxes Paid

APN 084-110-24



Washoe County Treasurer
Tammi Davis

Washoe County Treasurer
P.O. Box 30039, Reno, NV 89520-3039
ph: (775) 328-2510 fax: (775) 328-2500

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Tax Search
Payment Cart

Account Detail

← Back to Search Results
Change of Address
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Washoe County Parcel Information

Parcel ID	Status	Last Update
08411024	Active	5/9/2015 2:10:39 AM

Current Owner:
STONEFIELD INC
355 BOXINGTON WAY
SPARKS, NV 89434

SITUS:
0 INTERSTATE 80 E
WASHOE COUNTY NV

Taxing District: 4000 **Geo CD:**

Legal Description

Lot 2 Block Range 22 Township 20 SubdivisionName _UNSPECIFIED Section 29

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2014	\$5,454.47	\$5,454.47	\$0.00	\$0.00	\$0.00
2013	\$2,010.20	\$2,010.20	\$0.00	\$0.00	\$0.00
2012	\$1,929.16	\$1,929.16	\$0.00	\$0.00	\$0.00
Total					\$0.00

Important Payment Information

- **ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a convenience fee does apply for online credit card payments. See Payment Information for details.

Pay Online

No payment due for this account.

\$0.00

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845

Payment Information

Special Assessment District

Installment Date Information

Assessment Information



Washoe County Treasurer
Tammi Davis

Washoe County Treasurer
 P.O. Box 30039, Reno, NV 89520-3039
 ph: (775) 328-2510 fax: (775) 328-2500

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Washoe County Parcel Information

Parcel ID	Status	Last Update
08411026	Active	5/9/2015 2:10:39 AM

Current Owner:
 STONEFIELD INC
 355 BOXINGTON WAY
 SPARKS, NV 89434

SITUS:
 21575 INTERSTATE 80 E
 WASHOE COUNTY NV

Taxing District
 4000

Geo CD:

Legal Description

Lot 3-A Block Range 22 Township 20 SubdivisionName _UNSPECIFIED Section 29

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2014	\$1,478.48	\$1,478.48	\$0.00	\$0.00	\$0.00
2013	\$1,435.42	\$1,435.42	\$0.00	\$0.00	\$0.00
2012	\$1,377.56	\$1,377.56	\$0.00	\$0.00	\$0.00
Total					\$0.00

Important Payment Information

- ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a convenience fee does apply for online credit card payments. See Payment Information for details.

Pay Online

No payment due for this account.

\$0.00

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
 P.O. Box 30039
 Reno, NV 89520-3039

Overnight Address:
 1001 E. Ninth St., Ste D140
 Reno, NV 89512-2845

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[Installment Date Information](#)

[Assessment Information](#)



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Account Detail

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Washoe County Parcel Information

Parcel ID	Status	Last Update
08411027	Active	5/9/2015 2:10:39 AM

Current Owner:
STONEFIELD INC

355 BOXINGTON WAY
SPARKS, NV 89434

SITUS:
21905 INTERSTATE 80 E
WASHOE COUNTY NV

Taxing District
4000

Geo CD:

Legal Description

Lot 3-B Block Range 22 Township 20 SubdivisionName _UNSPECIFIED Section 29

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2014	\$11,978.58	\$11,978.58	\$0.00	\$0.00	\$0.00
2013	\$1,739.90	\$1,739.90	\$0.00	\$0.00	\$0.00
2012	\$1,669.76	\$1,669.76	\$0.00	\$0.00	\$0.00
Total					\$0.00

Important Payment Information

- ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a convenience fee does apply for online credit card payments. See Payment Information for details.

Pay Online

No payment due for this account.

\$0.00

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
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Reno, NV 89512-2845

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[Special Assessment District](#)

[Installment Date Information](#)

[Assessment Information](#)

FEASIBILITY-LEVEL GEOTECHNICAL EVALUATION

**TURQUOISE SOLAR PROJECT
RENO TECHNOLOGY PARK
WASHOE COUNTY, NEVADA**



**CONSTRUCTION
MATERIALS
ENGINEERS, INC.**



PREPARED FOR:

TURQUOISE SOLAR LLC

**MAY 2015
FILE: 1747**



6980 Sierra Center Parkway, Suite 90
Reno, NV 89511

May 14, 2015
Project no: 1747

Ms. Jill Daniel
**TURQUOISE SOLAR LLC. C/O
ESTUARY CAPITAL PARTNERS**
One Sansome Street, Suite 2900
San Francisco, CA 94104

**RE: Feasibility-level Geotechnical Evaluation Report
Turquoise Solar Project
Reno Technology Park
Washoe County, Nevada**

Dear Ms. Daniel:

Construction Materials Engineers, Inc. (CME) is pleased to submit the results of our feasibility-level geotechnical evaluation for the proposed Turquoise Solar Project at the Reno Technology Park in Washoe County, Nevada.

The purpose of this evaluation is to provide a feasibility-level study for preliminary development planning. Our evaluation includes research and a limited site reconnaissance. As part of this study, readily available published geologic and fault maps were reviewed. A design-level geotechnical investigation will ultimately be required for this project.

1.0 PROJECT DESCRIPTION

The project is in the preliminary design stages. It is understood that a solar generating facility with a capacity of 60 MW is proposed for the site. The property is comprised of approximately 580 acres and is located in the northeast corner of the Reno Technology Park near the base of the Pah Rah Range. The north end of the property is located in steeply sloping terrain with slope gradients of over 30 percent and is not expected to be developed.

Solar panels will be placed in rows across the site trending in a west to east direction. It is understood that the panel layout will generally conform to the existing terrain and grading is planned to be minimized as much as possible. A series of access roads with a gravel surface will be constructed across the project site.

2.0 SITE CONDITIONS

The project is located within the Truckee River corridor, immediately north of Interstate 80, approximately eight miles east of Sparks, Nevada. The site is located at the base of the southern flank of the Pah Rah Range, nestled within volcanic bedrock outcrops.

The topography varies across the proposed development area. The overall topography generally slopes in a near southerly direction with slope gradients ranging from about 4 to over 30 percent. Slope

gradients in the central to southern portions of the development range from about 4 to 14 percent and slope gradients in the northern portion of the development range from about 10 to over 30 percent. The total elevation differential across the planned developed portions of the parcel is about 450 feet.

Several existing drainages, trending in a north to south direction, are located across the project site. The major drainage areas are clustered toward the west and east sides of the project site. It is understood that drainage areas will not be developed.

Vegetation generally consists of sagebrush, small bushes, and scattered grasses. Several dirt roads and jeep trails cross the development area. Cobbles and boulders are strewn across the ground surface.

Several existing utilities are located within the property area. A 120kv electric transmission line is located through the southern portion of the project site. A gas line (Tuscarora) trends in an easterly direction through the central portion of the project site with a 50 foot wide easement. A 20-foot wide Bell Telephone of Nevada easement skirts the southeast corner of the project site.

3.0 RESEARCH

Several geotechnical studies have been completed for the Reno Technology Park with portions of these investigations included in the subject project site. Geotechnical and seismic information from these investigations are included in this feasibility study. These existing geotechnical studies are as follows:

- Preliminary Geotechnical Investigation *Reno Technology Park*, Construction Materials Engineers Inc.(CME), dated March 2011.
- Geotechnical Investigation, *Tuscarora 2002 Expansion Project Wadsworth Lateral*, Stantec Consulting, dated August, 2001.
- Geotechnical Feasibility Investigation, *Reno Technology Park*, Pezonella Associates, Inc., dated February, 2012.
- Feasibility Geotechnical investigation and Geologic Hazards Evaluation, *Reno Data Center Site*, Cornerstone Earth Group, March 2012.

4.0 GEOLOGIC AND GENERAL SOIL PROFILE DESCRIPTIONS

Based on a review of the Geologic Map of Washoe and Storey Counties, 1969, the project site is located within either Quaternary alluvium deposits or Tertiary volcanic bedrock (refer to Plate A-1 in Appendix A). The Tertiary volcanic bedrock is generally located in the northern portions of the project site and alluvium deposits are located toward the central to southern portions of the project site. The Tertiary volcanic bedrock is defined as either a basalt, or basaltic andesite and pyroxene andesite flow located along the northern and eastern margins of the site. Bedrock along the eastern margins of the site is from the Pyramid Sequence and has been classified as basalt, andesite, and dacite flows, low breccias, and tuffs.

Exploratory test pits, as referenced from the past geotechnical studies, have been excavated in either the Quaternary alluvium deposits or Pyramid Sequence. Test pits were excavated to maximum depths of 6 feet near the existing Tuscarora Gas Line easement that extends in a west to east direction through the central portions of the subject project site. Quaternary alluvium deposits were encountered in the western

to central portions of the project site. The geotechnical profile encountered consisted of a silty sand with gravel and cobbles (**SM**). A trace of sub-angular boulders with a maximum diameter of 18 inches were also encountered. Toward the eastern margin of the subject property, the Pyramid Sequence was encountered consisting of a light brown to black Tuff Breccia. All of these test pits were excavated with a rubber-tired backhoe.

Several test pits have also been excavated in the portion of the subject property located south of the gas line easement. Field exploration from the referenced Reno Technology Center Preliminary Geotechnical Investigation Report (CME, 2012) encountered a silty sand (**SM**) to a depth of 2½ feet below the existing ground surface (bgs) overlying a silty gravel with sand and cobbles (**GM**) encountered to the depth of exploration of 8½ feet bgs near the southern boundary of the subject project site. This deposit contained well rounded to rounded gravel and cobbles.

Several other test pits were excavated for the referenced geotechnical study by Cornerstone Earth Group in the southern portion of the project site. These test pits were excavated to depths of about 20 feet bgs. The uppermost soil stratum encountered from the ground surface to about 19 to 20 feet bgs was classified as a clayey gravel with sand (**GC**). This soil horizon contained mostly gravels and cobbles with some boulders to about 2 feet in diameter. Basaltic bedrock was encountered toward the base of the test pit at depths of about 20 feet.

4.1 Soil Moisture and Groundwater Conditions

Generally, soils were encountered in a slightly moist to moist soil condition. Ground water was not encountered during the previous explorations and is expected to lie at a depth well below that which would affect construction.

5.0 SEISMIC HAZARDS

5.1 Seismicity

Much of the Western United States is a region of moderate to intense seismicity related to movement of the crustal masses (plate tectonics). By far, the most active regions, outside of Alaska, are along the San Andreas Fault zone of western California. Other seismically active areas include the Wasatch Front in Salt Lake City, Utah, which forms the eastern boundary of the Basin and Range physiographic province, and the eastern front of the Sierra Nevada Mountains, which is the western margin of the province. The project site lies near the eastern base of the Sierra Nevada, within the western extreme of the Basin and Range.

5.2 Faults

A review of the Quaternary Fault Map of Nevada – Reno Sheet (Bell, 1984) indicates that the project site is located among four different active regional fault zones: Pyramid Lake Fault Zone is located approximately 11 miles east of the site; Carson Lineament is located approximately 15 miles south of the site; Sierra Nevada Fault Zone is located approximately 18 miles west of the site; and the Olinghouse Fault Zone is shown trending through the eastern portions of the site.

The Olinghouse Fault Zone is a northeasterly trending, left-lateral strike-slip fault with a projected mapped length of about 15.5 miles. This fault zone connects into the Pyramid Lake Fault Zone, which is a right-

lateral, northwest-trending fault. The Olinghouse Fault Zone is believed to have ruptured within the last 150 years. Newspaper accounts indicate that a major earthquake occurred in the Virginia City area in 1869 and it is believed that the epicenter for the earthquake occurred on the Olinghouse Fault Zone.

The approximate locations of faults in the project site are presented on the Geologic Map included in Appendix A. The location of these faults were derived from USGS mapping (Google Earth data) as well as from Cornerstone's report. Cornerstone shows several faults crossing the central to southern portion of the site. Except for the southernmost fault, these fault locations are based on geomorphic conditions and a site reconnaissance. It is understood that trenching was completed through the southernmost fault, confirming the existence of this fault. Fault studies including the excavation of fault trenches and researching aerial photos will be required to provide a more accurate location and boundaries of the faults within the project site.

Quaternary earthquake fault evaluation criterion has been formulated by a professional committee for the State of Nevada Earthquake Safety Council (1996, revised 1998). These guidelines are consistent with the State of California Alquist-Priolo Act of 1972, which defines Holocene Active Faults as those with evidence of displacement within the past 10,000 years (Holocene time). Those faults with evidence of displacement during Pleistocene time (10,000 to 1,600,000 years before present) are classified as either late Quaternary Active Fault (10,000 to 130,000 years) or Quaternary Active Fault (>130,000 years). Both of the latter fault designations are considered to have a lesser potential for activity than the Holocene Active Fault. An inactive fault is considered a fault that does not comply with these age groups.

Based on these guidelines, the Olinghouse Fault Zone is classified as a Holocene Active Fault. Currently, the referenced guidelines recommend that an occupied structure shall be constructed at least 50 feet away from a Holocene Active Fault. It is understood that occupied structures will not be located on the site.

5.3 Soil Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur during an earthquake, as cyclic shear stresses generate excessive pore water pressure between the soil grains. The soil types most susceptible to liquefaction are loose to medium dense cohesionless sands, soft to stiff non-plastic to low plastic silts, or any combination of silt-sand mixtures lying below the groundwater table. Liquefaction is generally limited to depths of 50 feet or less below the existing ground surface.

Because of the presence of shallow bedrock and depth of the groundwater, it is our opinion this site will likely not be susceptible to soil liquefaction.

6.0 SEISMIC DESIGN PARAMETERS

Seismic design parameters are based on site-specific estimates of spectral response ground acceleration as designated in the 2012 IBC. This approach allows the development of a response spectrum. Based on the period of the structure, a spectral acceleration for that structure can be determined. Seismic design parameters can be determined from the site classification and location (latitude and longitude). Site classification is based on the substrata soil profile type, as presented in Table 1.

Table 1 – Site Classification Definitions	
Site Classification	Soil Profile Type Description
A	Hard Rock
B	Rock
C	Very Dense Soil and Soft Rock
D	Stiff Soil Profile
E	Soft Soil Profile
F	Soil Type Requiring Site-Specific Evaluation

The soil/bedrock profile classification is based on two criteria: relative density (primarily for soils based on either SPT blow count data or shear wave velocity) or hardness (based on shear wave velocity primarily for bedrock sites). These two criteria have to be determined to a depth of 100 feet below the ground surface. A 100-foot deep boring or geophysical methods are required to characterize the soil profile in sufficient detail to determine the site classification. If neither of these field exploration methods are performed, the IBC allows the use of a default site classification of D if other geologic conditions do not exist that would justify a lower site classification (E or F). Based on the existing geologic information, it is our opinion that either a Site Classification of C or D will be encountered in this project site.

Spectral response acceleration values (S_s & S_1) are based on structures underlain by bedrock with a site classification of B. Acceleration values may amplify or attenuate depending on the subsurface geologic conditions and site classification other than B. Therefore, IBC provides correction factors (F_a & F_v) to modify the acceleration values depending on the subsurface geologic conditions (site classification).

Spectral response acceleration values were determined from the USGS website: *U.S. Seismic Design Maps*. Table 2 provides a summary of seismic design parameters, based of 2010 ASCE 7, as referenced by IBC, including correction factors F_a & F_v . A printout of the design information including spectral response acceleration values is provided in Appendix B.

Table 2 – Seismic Design Parameters	
PARAMETER DESCRIPTION	Approximately Center of Project site
Approximate Latitude of Site	39.5836
Approximate Longitude of Site	119.5194
Peak Ground Acceleration-MCE _R PGA <small>(ASCE 7-10 Standard)</small>	0.485 g (Site Class D) and 0.472 g (Site Class C)
Spectral Response Acceleration at Short period (0.2 sec.) S _s (for Site Class B)	1.260 g
Spectral Response Acceleration at 1-second Period, S ₁ (for Site Class B)	0.429 g
Site Class Selected for this Site	C or D
Site Coefficient F _a , decimal	1.0
Site Coefficient F _v , decimal	1.57 (Site Class D) and 1.37 (Site Class C)
Design Spectral Response Acceleration at Short period, S _{Ds} (Adjusted to Site Class B, SDs= 2/3 SMs)	0.840 g
Design Spectral Response Acceleration at 1-second Period, S _{D1} (Adjusted to Site Class B, SD1=2/3 SM1)	0.449 g (Site Class D) and 0.392g (Site Class C)
1) MCE _R PGA- Maximum credible earthquake geometric mean peak ground acceleration.	

7.0 DESIGN/PLANNING CONSIDERATIONS

From a geotechnical standpoint, it is our opinion that the project site can be developed as planned. However, several geomorphic and geologic constraints are present at the project site, as follows:

- Steepened slopes with gradients between 20 to 30 percent are located in the planned developed areas in the northern to central portions of the project site. Graded or disturbed slopes between 20 to 30 percent may cause potential slope erosion difficulties;
- Potential shallow bedrock and abundance of cobble and boulders in the overburden soils may cause both excavation and grading difficulties. The excavation characteristics of the bedrock will need to be determined; however, based on the bedrock type excavation could be difficult. Shallow bedrock (less than 20 feet), if present, based on the existing geotechnical information, would be located in the central to northern portion of the proposed developed area. Cobbles and boulders generated by grading could be crushed to produce base material for roadways;
- Trenching in shallow bedrock or materials with considerable large cobbles and boulders will be difficult with small construction equipment. Excavated material used as backfill may have to be screened;

- Shallow bedrock and coarse grained overburden soils with cobbles and boulders will restrict solar panel foundation options. Driven piles or small diameter pier type foundations will be difficult to construct in these materials. Further site characterization may indicate localized areas conducive to these foundation types. Other foundation types should be considered in remaining areas.

Subsequent geotechnical investigations will include additional field exploration, especially in the northern portion of the project site. During the field exploration, the geotechnical profile will be characterized including areas of shallow bedrock. Design and construction recommendations for the site development will be based on the results of these subsequent geotechnical investigations.

8.0 LIMITATIONS

This report has been prepared in accordance with generally accepted local geotechnical practices. Recommendations are based upon existing geotechnical information available for the project site. This report does not reflect soil variations that may become evident during subsequent investigations and construction period, at which time re-evaluation of the recommendations may be necessary. Sufficient construction observation should be completed in all phases of the project related to geotechnical factors to document compliance with our recommendations.

This report has been prepared to provide information allowing preliminary design of the project. The owner/project manager is responsible for distribution of this report to all designers and contractors whose work is affected by geotechnical recommendations. In the event of changes in the design, location, or ownership of the project after presentation of this report, the recommendations given in the report should be reviewed and possibly modified by the geotechnical engineer¹. The engineer makes no other warranties, either expressed or implied, as to the professional advice provided under the terms of this agreement and included in this report.

This report was prepared by CME for Estuary Capital Partners. The material in it reflects our best judgment in light of the information available to us at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based upon it, are the responsibility of such third parties. Construction Materials Engineers Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

¹ If the geotechnical engineer is not accorded the privilege of making this recommended review, he/she can assume no responsibility for misinterpretation or misapplication of his recommendations or their validity in the event changes have been made in the original design concept without his prior review.

Ms. Jill Daniel
TURQUOISE SOLAR LLC. C/O
ESTUARY CAPITAL PARTNERS
May 14, 2015
Page 8 of 9

The following Appendices are included and completed this report.

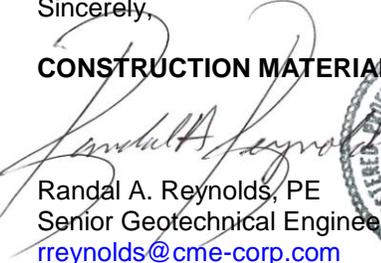
Appendix A: Vicinity map showing project location (Plate A-1); Geologic Map showing approximate fault locations and soil/bedrock types (Plate A-2).

Appendix B: USGS design maps Summary Report

If you have any questions, or require further information please contact us.

Sincerely,

CONSTRUCTION MATERIALS ENGINEERS, INC.


Randal A. Reynolds, PE
Senior Geotechnical Engineer
rreynolds@cme-corp.com
Direct: 775-737-7576
Direct Fax: 775-737-7607



Exp. 12-31-15

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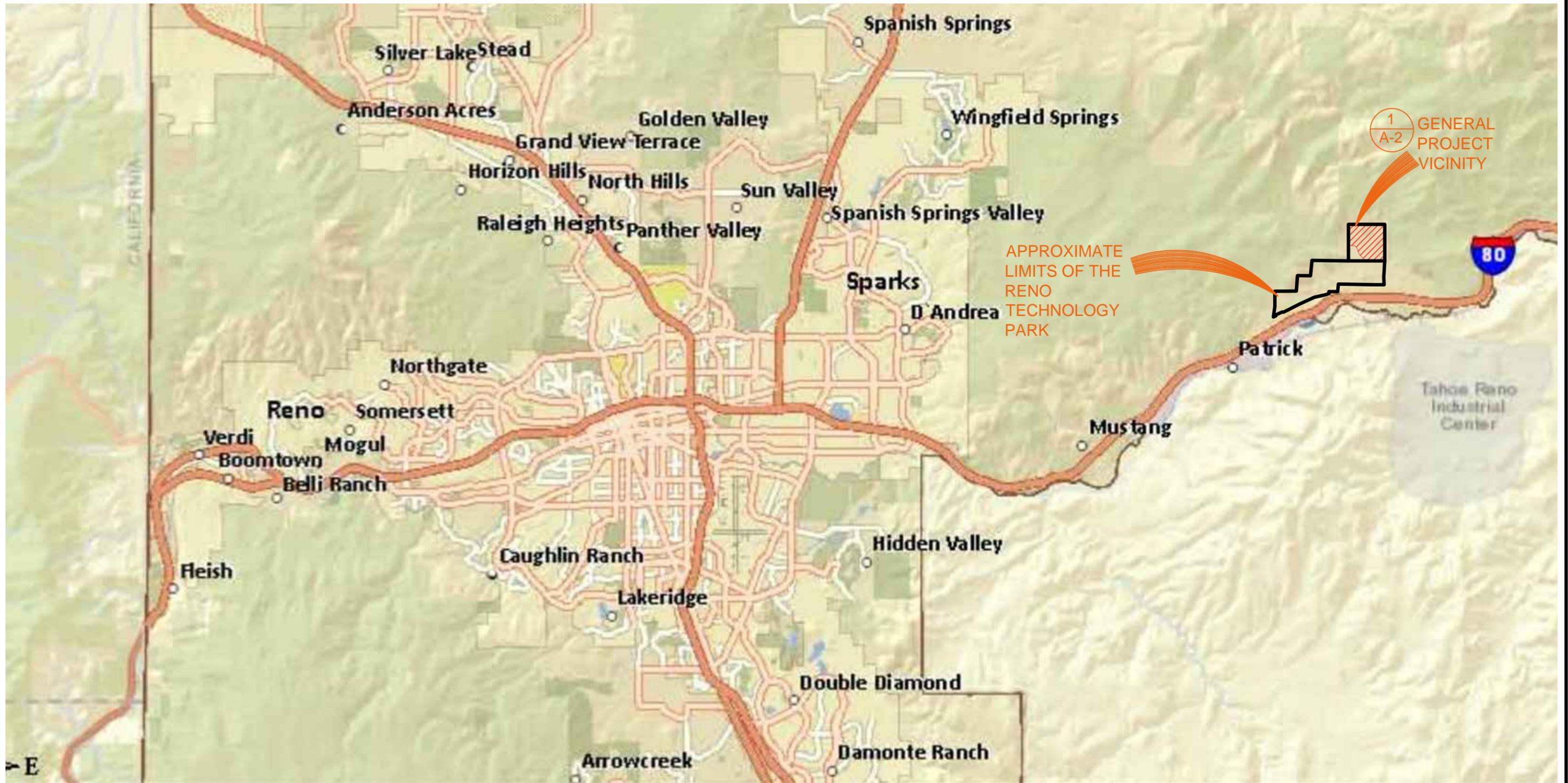
Ms. Jill Daniel
TURQUOISE SOLAR LLC. C/O
ESTUARY CAPITAL PARTNERS
May 14, 2015
Page 9 of 9

REFERENCES

- Bell, J. W., 1984, *Quaternary Fault Map of Nevada, Reno Sheet*. Nevada Bureau of Mines and Geology (NBMG), Map 79.
- Bonham, H. F. and K. G. Papke, 1969, *Geology and Mineral Deposits of Washoe and Storey Counties, Nevada*: (Nevada Bureau of Mines and Geology) Bulletin 70, 1969.
- Feasibility Geotechnical investigation and Geologic Hazards Evaluation, 2012, *Reno Data Center Site*, Cornerstone Earth Group, project no: 197-3-1.
- Geotechnical Investigation, 2001, *Tuscarora 2002 Expansion Project Wadsworth Lateral*, Stantec Consulting, project no:
- Geotechnical Feasibility Investigation, 2012, *Reno Technology Park*, Pezonella Associates, Inc., project no: 6311.01-A.
- International Building Code, 2012; *International Code Council, Inc.*
- Nevada Earthquake Safety Council, 1996 revised 1998, *Guidelines for Evaluating Potential Surface fault Rupture /land Subsidence Hazards in Nevada*.
- Preliminary Geotechnical Investigation, 2011, *Reno Technology Park*, Construction Materials Engineers Inc.(CME), project no: 1280
- USGS website: *Earthquake Hazards Program U.S. Seismic Design Maps*
<http://earthquake.usgs.gov/designmaps/us/application.php>
- USGS Website: *Earthquake Hazards Program Quaternary Faults in Google Earth*
<http://earthquake.usgs.gov/hazards/qfaults/google.php>



APPENDIX A



REFERENCE: BASE MAP WASHOE COUNTY TECHNOLOGY SERVICES-REGIONAL SERVICES DIVISION (GIS), WWW.WASHOECOUNTY.US/GIS



CME CONSTRUCTION MATERIALS ENGINEERS INC.

6980 Sierra Center Parkway, Suite 90
Reno, NV 89511

TURQUOISE SOLAR C/O
ESTUARY CAPITAL PARTNERS
VICINITY MAP
WASHOE COUNTY, NEVADA

PROJECT NO.: 1747

DATE: 05/06/15

LEGEND

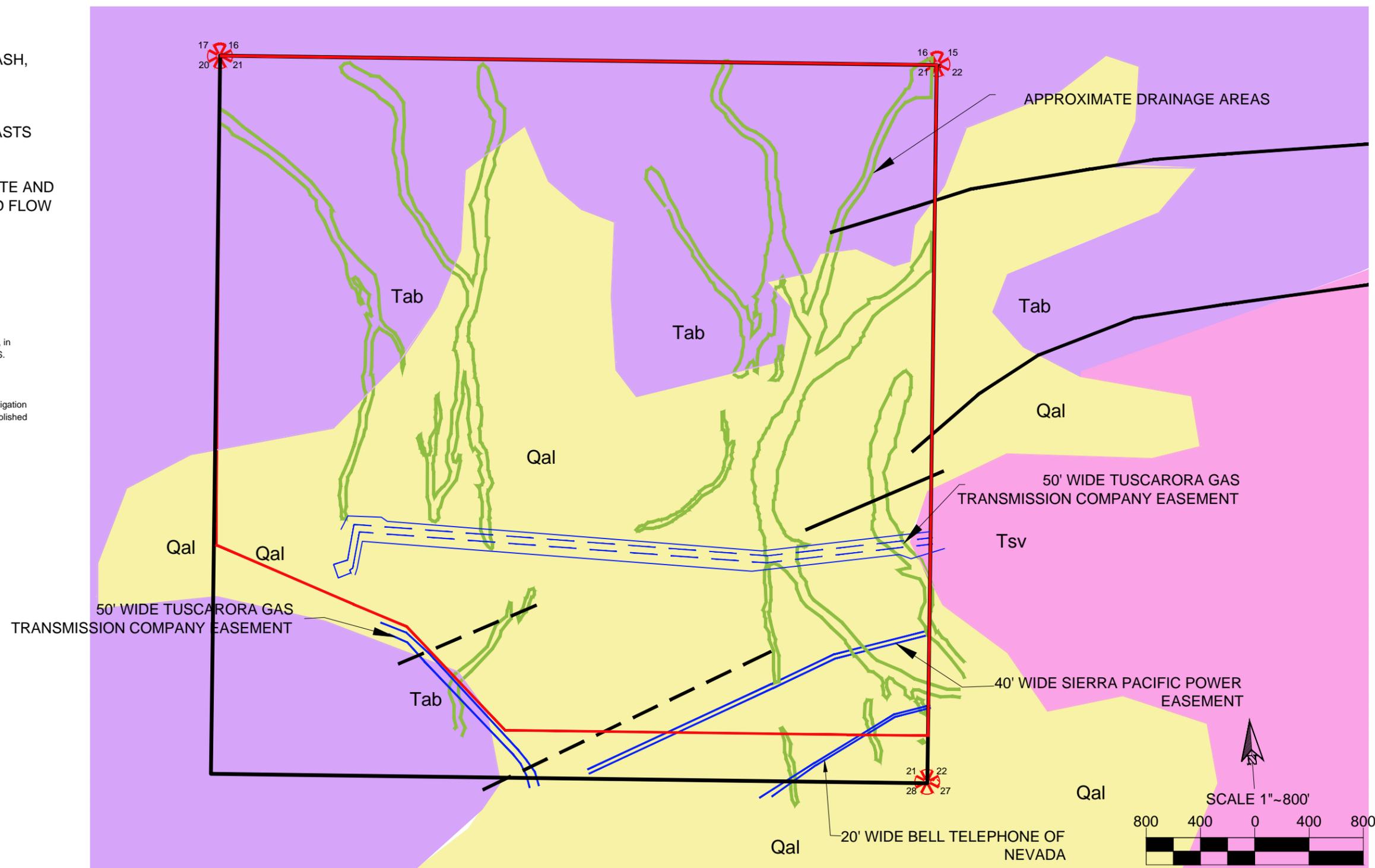
PLATE

A-1

- Qal STREAM DEPOSITS, TALUS, SLOPE WASH, ALLUVIAL FAN
- Tab BASALT , BASALTIC ANDESITE AND PYROXENE ANDESITE FLOWS PROCLASTS AND ASSOCIATED INTRUSIVE PHASES
- Tsv PYRAMID SEQUENCE, BASALT ANDESITE AND DACITE FLOWS, FLOW BRECCIAS, MUD FLOW BRECCIAS, TUFFS, AND ASSOCIATED INTRUSIVES

OLINGHOUSE FAULT ZONE

1. (GOOGLE EARTH) Adams, K., Sawyer, T.L., compilers, 1999, Fault number 1668, Olinghouse fault zone, in Quaternary fault and fold database of the United States: U.S. Geological Survey website: <http://earthquakes.usgs.gov/hazards/qafaults>,
2. Cornerstone Earth Group, Feasibility Geotechnical Investigation and Geologic Hazards Evaluation, Reno Data Center, unpublished report, 2012



① GEOLOGIC EXHIBIT

REFERENCE: BASE MAP GEOLOGIC MAP OF WASHOE AND STOREY COUNTIES, NEVADA, BY H. F. BONHAM, 1969 AND SITE PLAN PROVIDED BY STANTEC ENTITLED SOLAR SITE LAYOUT, PROPOSED ROADS AND AVAILABLE AREAS FOR PANELS

CME CONSTRUCTION MATERIALS ENGINEERS INC.
 6980 Sierra Center Parkway, Suite 90
 Reno, NV 89511

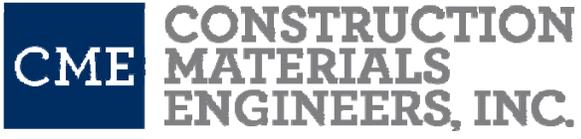
TURQUOISE SOLAR LLC. C/O
 ESTUARY CAPITAL PARTNERS
 GEOLOGIC EXHIBIT
 WASHOE COUNTY, NEVADA

PROJECT NO.: 1747 DATE: 4/28/2015

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PLATE
A-2

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APPENDIX B

USGS Design Maps Summary Report

User-Specified Input

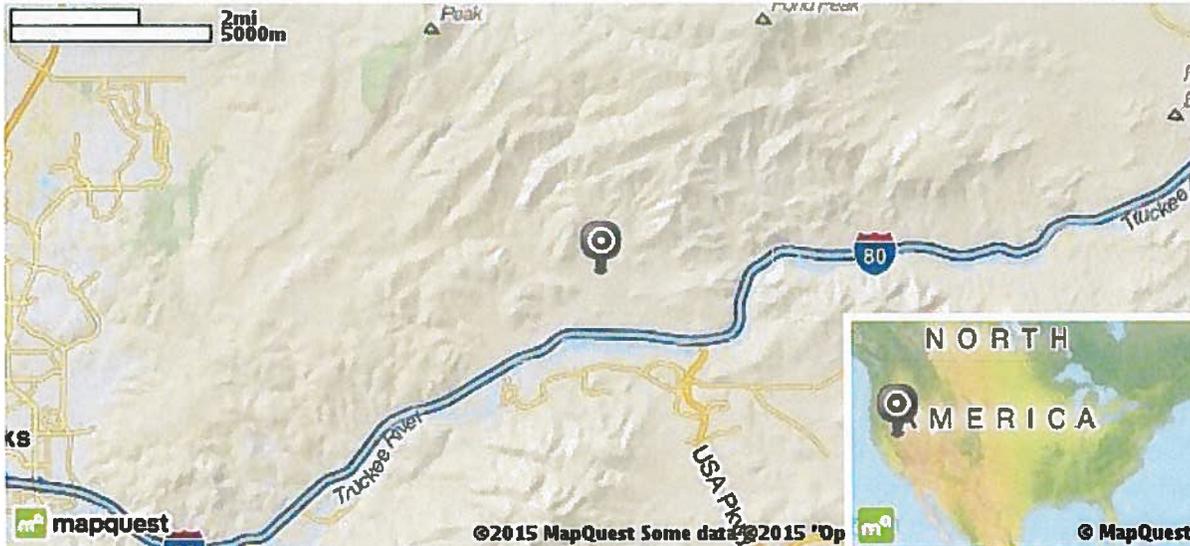
Report Title Turquoise Solar
Tue April 28, 2015 22:58:55 UTC

Building Code Reference Document ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

Site Coordinates 39.5836°N, 119.5194°W

Site Soil Classification Site Class C - "Very Dense Soil and Soft Rock"

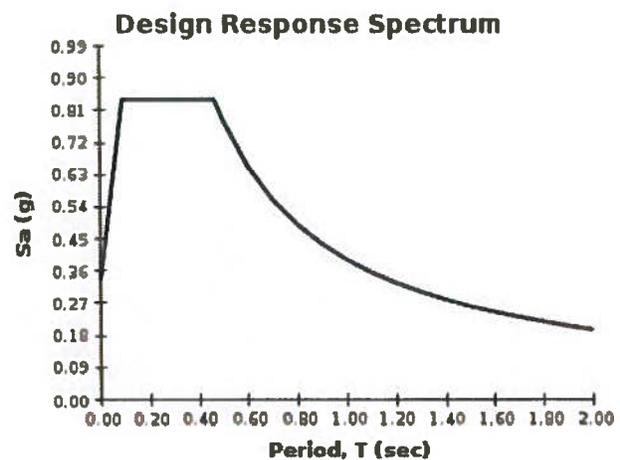
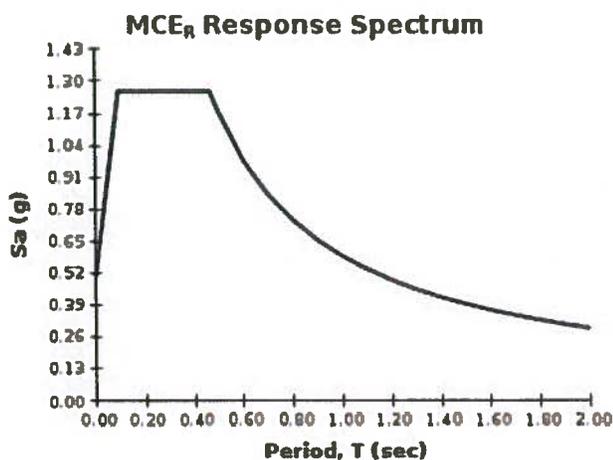
Risk Category I/II/III



USGS-Provided Output

$S_s = 1.260 \text{ g}$	$S_{M_s} = 1.260 \text{ g}$	$S_{D_s} = 0.840 \text{ g}$
$S_1 = 0.429 \text{ g}$	$S_{M_1} = 0.588 \text{ g}$	$S_{D_1} = 0.392 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



For PGA_M , T_L , C_{RS} , and C_{R1} values, please [view the detailed report](#).


Design Maps Detailed Report

ASCE 7-10 Standard (39.5836°N, 119.5194°W)

Site Class C – “Very Dense Soil and Soft Rock”, Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_s) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From **Figure 22-1**^[1]

$S_s = 1.260 \text{ g}$

From **Figure 22-2**^[2]

$S_1 = 0.429 \text{ g}$

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class C, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics:			
<ul style="list-style-type: none"> • Plasticity index $PI > 20$, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf 			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_s

Site Class	Mapped MCE _R Spectral Response Acceleration Parameter at Short Period				
	S _s ≤ 0.25	S _s = 0.50	S _s = 0.75	S _s = 1.00	S _s ≥ 1.25
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_s

For Site Class = C and S_s = 1.260 g, F_s = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE _R Spectral Response Acceleration Parameter at 1-s Period				
	S ₁ ≤ 0.10	S ₁ = 0.20	S ₁ = 0.30	S ₁ = 0.40	S ₁ ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S₁

For Site Class = C and S₁ = 0.429 g, F_v = 1.371

Equation (11.4-1): $S_{MS} = F_a S_s = 1.000 \times 1.260 = 1.260 \text{ g}$

Equation (11.4-2): $S_{M1} = F_v S_1 = 1.371 \times 0.429 = 0.588 \text{ g}$

Section 11.4.4 — Design Spectral Acceleration Parameters

Equation (11.4-3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.260 = 0.840 \text{ g}$

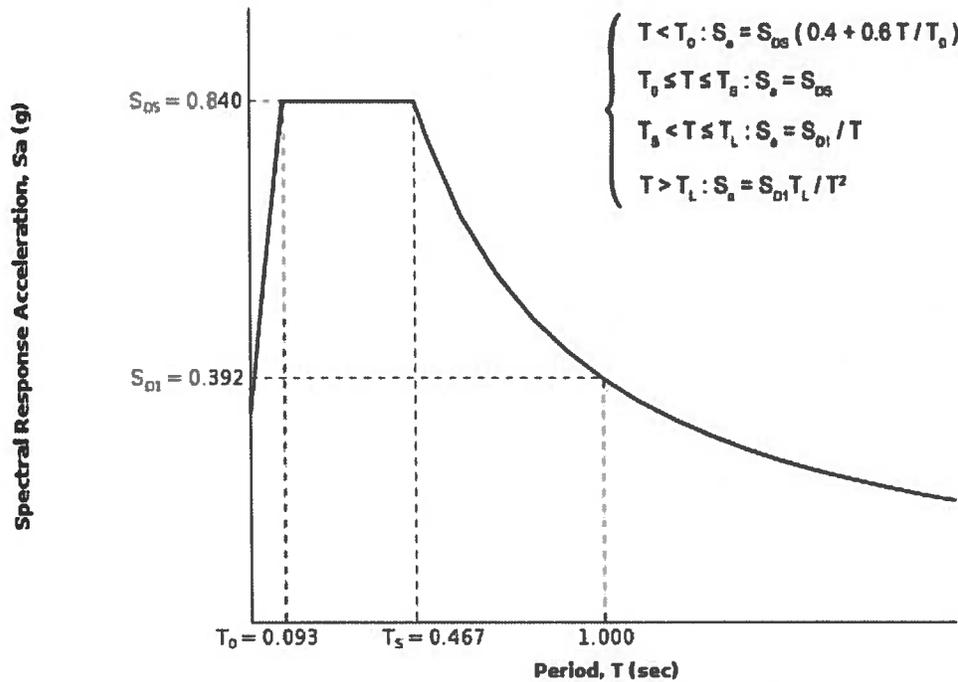
Equation (11.4-4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.588 = 0.392 \text{ g}$

Section 11.4.5 — Design Response Spectrum

From **Figure 22-12** ^[3]

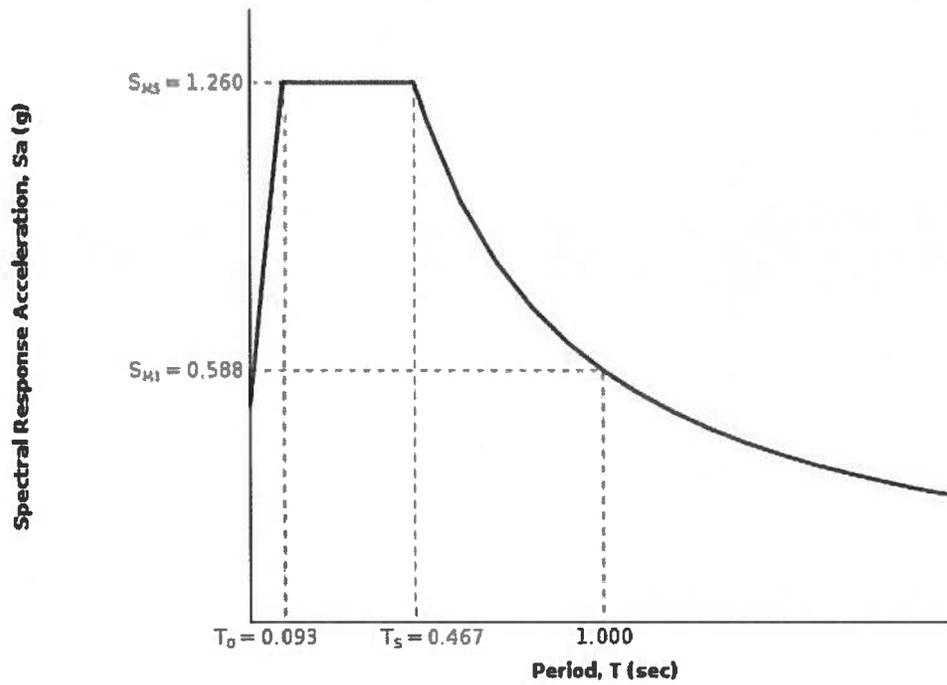
$T_L = 6 \text{ seconds}$

Figure 11.4-1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From **Figure 22-7** ^[4]

$$PGA = 0.472$$

Equation (11.8-1):

$$PGA_M = F_{PGA}PGA = 1.000 \times 0.472 = 0.472 \text{ g}$$

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = C and PGA = 0.472 g, $F_{PGA} = 1.000$

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From **Figure 22-17** ^[5]

$$C_{RS} = 0.978$$

From **Figure 22-18** ^[6]

$$C_{R1} = 0.966$$

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and $S_{DS} = 0.840 g$, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and $S_{D1} = 0.392 g$, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category \equiv "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. Figure 22-1: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. Figure 22-2: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. Figure 22-12: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. Figure 22-7: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. Figure 22-17: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. Figure 22-18: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

USGS Design Maps Summary Report

User-Specified Input

Report Title Turquoise Solar
Tue April 28, 2015 22:56:14 UTC

Building Code Reference Document ASCE 7-10 Standard
(which utilizes USGS hazard data available in 2008)

Site Coordinates 39.5836°N, 119.5194°W

Site Soil Classification Site Class D - "Stiff Soil"

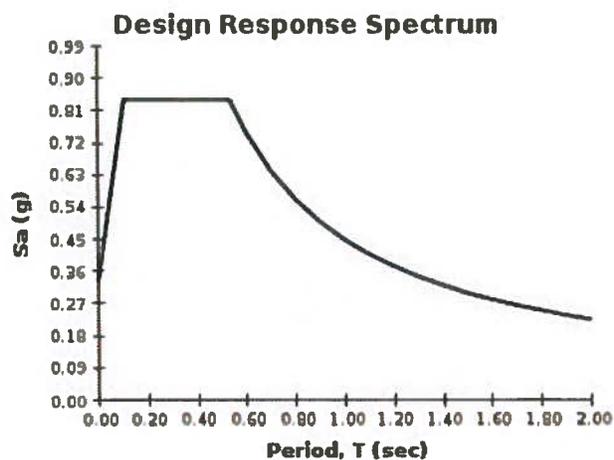
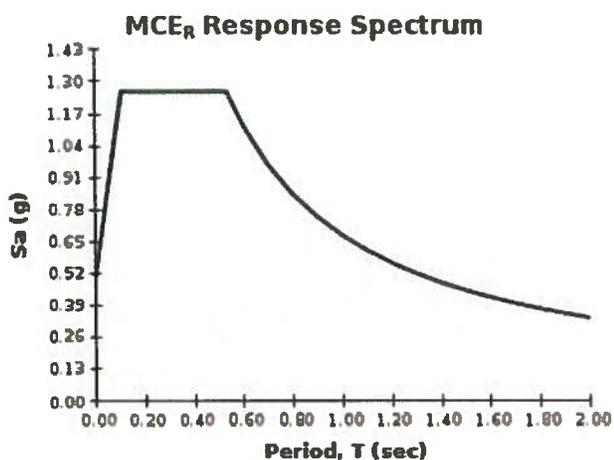
Risk Category I/II/III



USGS-Provided Output

$S_s = 1.260 \text{ g}$	$S_{M5} = 1.260 \text{ g}$	$S_{D5} = 0.840 \text{ g}$
$S_1 = 0.429 \text{ g}$	$S_{M1} = 0.674 \text{ g}$	$S_{D1} = 0.449 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



For PGA_M , T_L , C_{RS} , and C_{R1} values, please [view the detailed report](#).


Design Maps Detailed Report

ASCE 7-10 Standard (39.5836°N, 119.5194°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_s) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From **Figure 22-1**^[1] $S_s = 1.260 g$ From **Figure 22-2**^[2] $S_1 = 0.429 g$ **Section 11.4.2 — Site Class**

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
Any profile with more than 10 ft of soil having the characteristics:			
<ul style="list-style-type: none"> • Plasticity index $PI > 20$, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf 			
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_s

Site Class	Mapped MCE _R Spectral Response Acceleration Parameter at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_s

For Site Class = D and $S_s = 1.260$ g, $F_s = 1.000$

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE _R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and $S_1 = 0.429$ g, $F_v = 1.571$

Equation (11.4-1): $S_{MS} = F_a S_s = 1.000 \times 1.260 = 1.260 \text{ g}$

Equation (11.4-2): $S_{M1} = F_v S_1 = 1.571 \times 0.429 = 0.674 \text{ g}$

Section 11.4.4 — Design Spectral Acceleration Parameters

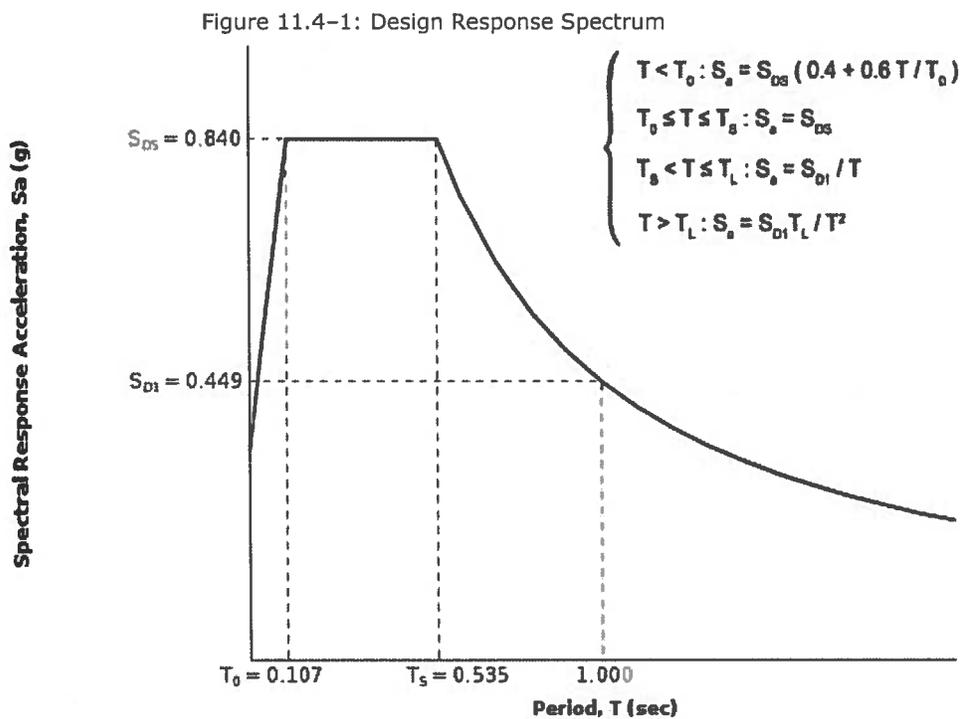
Equation (11.4-3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.260 = 0.840 \text{ g}$

Equation (11.4-4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.674 = 0.449 \text{ g}$

Section 11.4.5 — Design Response Spectrum

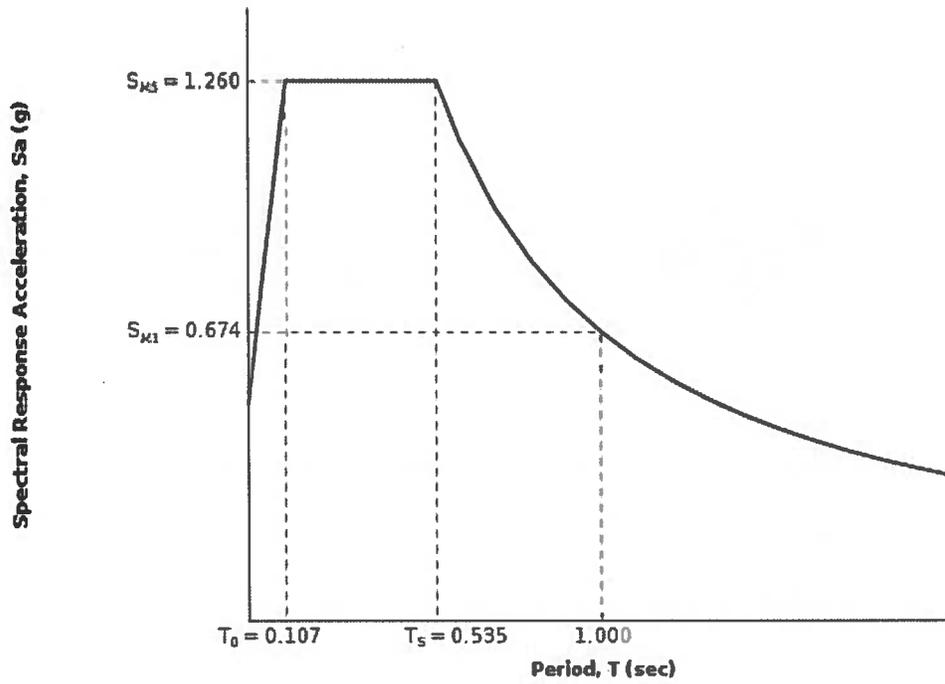
From **Figure 22-12**^[3]

$T_L = 6 \text{ seconds}$



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From **Figure 22-7**^[4]

$$PGA = 0.472$$

Equation (11.8-1):

$$PGA_M = F_{PGA}PGA = 1.028 \times 0.472 = 0.485 \text{ g}$$

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.472 g, $F_{PGA} = 1.028$

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From **Figure 22-17**^[5]

$$C_{RS} = 0.978$$

From **Figure 22-18**^[6]

$$C_{R1} = 0.966$$

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and $S_{DS} = 0.840 g$, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and $S_{D1} = 0.449 g$, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category \equiv "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf



VIA E-MAIL

May 12, 2015

Ms. Jill M. Daniel
Turquoise Solar LLC
c/o Estuary Capital Partners, Principal
One Sansome Street, Suite 2900
San Francisco, CA 94104

Subject: Turquoise Solar Project Biological and Cultural Due Diligence Report

Dear Jill,

Enclosed please find the Turquoise Solar Project Biological and Cultural Due Diligence Report for the installation of 60 megawatts (MW) of solar power generation capacity and associated infrastructure at the Reno Technology Park located approximately 18 miles east of Sparks Nevada.

According to Nevada Revised Statute 704.860, renewable energy facilities fewer than 70 MW are exempt from the Utility Environmental Protection Act. Therefore, consistent with the Washoe County Planning Commission and the Truckee Meadows Regional Plan, a Special Use Permit (SUP) is required. The SUP application process does not require environmental permitting, however the Nevada Department of Environmental Protection (NDEP) will receive a copy of the SUP. Turquoise Solar LLC is taking precautionary steps by performing a biological and cultural record search should such information be required as a condition of the SUP.

The biological record search included contacting the Carson City District Bureau of Land Management (BLM) to inquire about adjacent wild horse Herd Areas (HA); contacting the Nevada Natural Heritage Program (NNHP) to obtain a list of potential at-risk species; and contacting the Nevada Department of Wildlife (NDOW) to inquire about occupied big game areas that exist in and adjacent to the project area.

According to the BLM the Pah Rah Mountains and Horse Springs HAs are not managed for wild horses due to a checkerboard pattern of public and private land that makes management unfeasible in these areas. Any horses that exist in the Pah Rah Mountains now are decedents of horses that originated from the Pyramid Lake Indian Reservation and do not fall under the Wild Horse and Burro Act.

There are no at-risk species recorded within the project area (including a 1.2 mile buffer) according to the NNHP, however the sand cholla (*Grusonia pulchella*), a species determined to be Imperiled by NNHP and a BLM special status species, has been identified as having potential habitat, however no species sightings have been observed in the project area.

The project area provides little habitat for NDOW big game species of concern. The mule deer that occur in the project area are likely resident deer, moving between the river and uplands seasonally. Habitat for deer within the project area is relatively limited due to the low quality forage and fragmented habitat from



Interstate-80 and industrial development. The project area is likely to have very low use by mule deer and is not anticipated to impact mule deer.

There are federally listed fish species that occur within the Truckee River such as the Lahontan cutthroat trout, *Oncorhynchus clarkii henshawi*, a Federally Threatened species, the cui-ui, *Chasmistes cujus*, a Federally Endangered species, and the California floater, *Anodonta californiensis*, a Nevada BLM and a United States Forest Service (Region 5) Sensitive Species. Best Management Practices will be undertaken during construction to avoid potentially adverse effects on the river.

A few ephemeral drainages cut across the project area draining the lower slopes of the Pah Rah Range to the Truckee River. The project will be required to obtain a Storm Water Pollution Prevention Plan (SWPPP) as well as a Storm Water Discharge Permit from the NDEP prior to any land clearing activities. Requirements of a SWPPP will control potential sediment and contaminants in discharges that could potentially affect the Truckee River. Therefore, it is not anticipated that the project would increase sedimentation loading to the river, or contribute appreciable pollutant discharges to the river in a manner that would affect listed fish populations.

The cultural record search revealed no National Register properties located within the project area or historic districts located within 1-mile of the project area. Two prior archaeological investigations have been conducted within the project area; however neither project resulted in the identification of archaeological sites within the project area.

The background record search identified the presence of a historic transmission line, more than fifty years in age, which bisects the lower half of the proposed project area. If the project falls under federal oversight the Nevada State Historic Preservation Office (SHPO) will require the significance of the resource to be evaluated in the field by a qualified archaeologist if standing historic architectural elements are present within the project area, such as historic era utility. Julie Ernstein, Deputy State Historic Preservation Officer (correspondence via telephone on April 6, 2015), confirmed that if the project falls under federal oversight, for instance with the US Army Corp of Engineers, it would become subject to review by the SHPO. However, since the project does not require federal oversight it is not subject to review by SHPO.

We appreciate the opportunity to continue supporting you and the Turquoise Solar Project. If you have any questions, please call me at (775) 671-5662.

Sincerely,

A handwritten signature in blue ink that reads "Colleen Lavery". The signature is written in a cursive, flowing style.

Colleen Lavery
Senior Environmental Planner/NEPA Specialist/Project Manager

Cc: Aaron Mann



**Biological and Cultural Record Search Report
Turquoise Solar Project
Washoe County, NV**

Introduction

The Turquoise Solar Project, currently under development by Turquoise Solar LLC, will include the installation of 60 megawatts (MW) of solar power generation capacity and associated infrastructure at the Reno Technology Park. The Reno Technology Park is located approximately 18 miles east of Sparks, Nevada on the north side of Interstate 80 (I-80), near the Patrick Exit. The project area is located south of the Pah Rah Mountain Range, in Township 20 North (T. 20N), Range 22 East (R. 22E) Section 21, Mount Diablo Meridian, and is approximately 586 acres (Figure 1).

According to Nevada Revised Statute 704.860, renewable energy facilities less than 70 MW are exempt from the Utility Environmental Protection Act. The Washoe County Planning Commission and the Truckee Meadows Regional Plan, require a Special Use Permit (SUP).

Since the SUP application process does not require environmental permitting and the Nevada Department of Environmental Protection (NDEP) will receive a copy of the SUP, Turquoise Solar LLC is taking precautionary steps by performing a biological and cultural record search. The purpose of this document is to provide biological and cultural due diligence for the Turquoise Solar Project.

Biological

A data request on endangered, threatened, candidate, and/or at-risk plant and animal species recorded within or near the Turquoise Solar Project area was submitted by Redhorse Corporation and received by the Nevada Natural Heritage Program (NNHP) on March 27, 2015. The NNHP searched their database and maps for a two kilometer radius (1.24 miles) around the project area located in T. 20N, R. 22E Section 21, Mount Diablo Base and Meridian.

The Reno Technology Park environmental review site visit, conducted by Redhorse on May 6, 2011, revealed that the project area occurs within a mixed salt desert shrub plant community; the dominant species being shadscale and budsage. This habitat is relatively unscathed by historic fires but is bounded by transmission lines and a natural gas pipeline. The majority of the surrounding landscape contains varying degrees of fire affected and otherwise degraded habitats.

There are no at-risk species recorded within this area. However, the sand cholla (*Grusonia pulchella*), a taxon determined to be Imperiled by NNHP and a BLM special status species, has been identified as having potential habitat in the project area. A NNHP sand cholla taxonomy detail sheet can be found in Appendix A. The Lahontan cutthroat trout, *Oncorhynchus clarkii henshawi*, a Federally Threatened Taxon, the cui-ui, *Chasmistes cujus*, a Federally Endangered Taxon, and the California floater, *Anodonta californiensis*, a Nevada Bureau of Land Management and a United States Forest Service (Region 5) Sensitive Species, occur in the Truckee River and should be considered if disturbances are anticipated in the area. Correspondence from NNHP is included in Appendix A.



Wild Horses and Burros – The Carson City District Bureau of Land Management (BLM) manages land located to the west, north, and east of the project area (Figure 1). In the recent past the Pah Rah Mountains Herd Area (HA) was located north of the project area and the Horse Spring HA to the south. A Carson City District BLM Wild Horse and Burro Herd Area and Herd Management Areas map from the November 2014 Carson City District Draft Resource Management Plan and Environmental Impact Statement (RMP/EIS) Alternative A (No Action) can be found in Appendix A.

According to the Carson City District Draft RMP/EIS and communications with the Carson City BLM Wild Horse and Burro Specialist, John Axtell on March 26, 2015, the Pah Rah Mountains and Horse Springs HAs are not managed for wild horses due to a checkerboard pattern of public and private land that makes management unfeasible in these areas. All wild horses were removed from the Pah Rah Mountain Range in 1984. Since 1984, however, some horses have moved over from the Pyramid Lake Indian Reservation. Substantial areas of the Pah Rah Mountains consist of steep terrain with limited road access, so capture attempts have not kept up with immigration and reproduction; therefore, a population of horses currently occupies the Pah Rah Mountains. These horses are classified as stray animals under Nevada State Laws and are not wild horses under the Wild Horse and Burro Act; therefore, they are not managed by the BLM. Any horses that exist in the Pah Rah Mountains now are decedents of horses that originated from the Pyramid Lake Indian Reservation and do not fall under the Wild Horse and Burro Act. Correspondence from BLM is included in Appendix A.

Big Game – Mule deer distribution as mapped by the Nevada Department of Wildlife (NDOW) exists throughout the project area. The deer that occur within the project area are likely resident deer, moving between the river and uplands seasonally. Habitat for deer within the project area is relatively limited due to the low quality forage and fragmented habitat from Interstate 80 and industrial development. According to NDOW, pronghorn antelope distribution exists just north of the project area; however their movement corridors are located northeast of the project area on the east side of the Pah Rah Mountain range. A distribution of desert bighorn sheep exists just south of the project area. However, no known movement corridors exist anywhere near the project area. Elk are not known to occur within western Nevada. Many studies on big game have documented that big game will avoid habitats where noise and human activities occur. The *Habitat Guidelines for Mule Deer Intermountain West Ecoregion*, by the Mule Deer Working Group (2009), states that if big game are dispersed adjacent to the project area, it is more than likely that the noise and increased human activity in the project area would likely displace big game to adjacent habitat. This is expected to occur during construction and continued use of the Reno Technology Park, however, the project area is likely to have very low use by mule deer and is not anticipated to impact the mule deer herd. See the NDOW figures for details regarding these big game species distributions relative to the project area and correspondence from NDOW in Appendix A.

Cultural

A background records search of known archaeological investigations and previously recorded or known cultural sites within 1-mile of the proposed project location was conducted with the Nevada State Museum in Carson City. The resulting records search includes all of Sections 15 through 17, 20 through 22, and 27 through 29 of Township 20 North, Range 22 East and can be found on the Patrick, Nevada

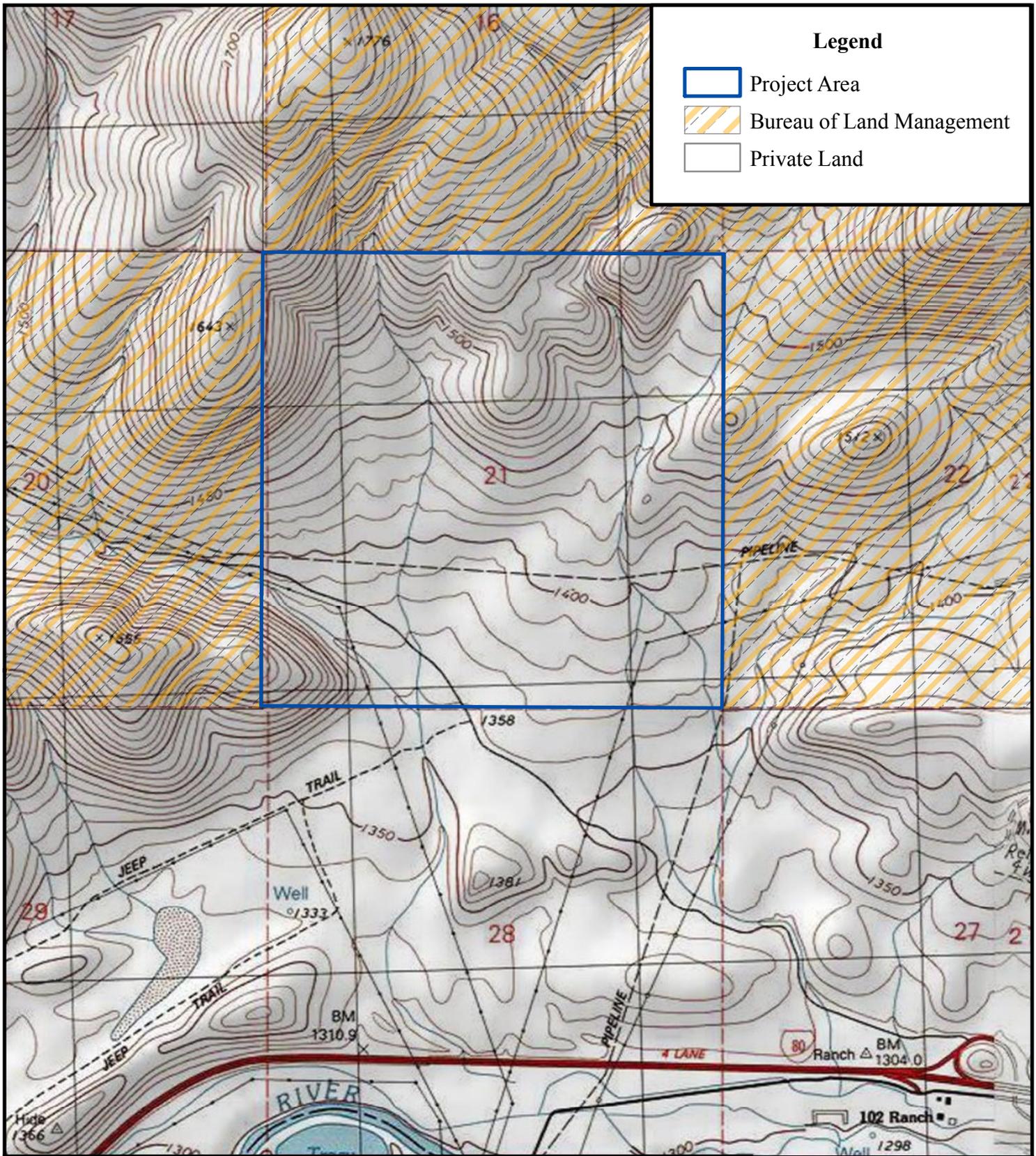


Figure 1 Project Area Map and Land Status

Turquoise Solar LLC
 Turquoise Solar Project

Scale 1:24,000
 1 Inch = 2,000 feet



NAD 83

May 2015

Patrick, NV 1980
 Quadrangle Map

T20N, R22E
 Section 21
 (MDBM)



1980 and Derby Dam (Provisional Edition 1985), 7.5-minute US Geological Survey (USGS) quadrangle maps. In addition, a background literature search included archival research of historic General Land Office (GLO) and USGS maps, historical indices, a review of existing contexts related to the project area; and a check of properties listed on the National Register (NR) was conducted. The compiled resources were used to predict the frequency and kinds of cultural resources that would be expected within the project area (Figure 1).

Cultural Resources Records Search Results – A review of the NVCRIS database revealed a total of 33 prior archaeological investigations (Table 1) in addition to 35 archaeological sites (Table 2) within 1-mile of the project area. The majority of projects are associated with development along the I-80 corridor and the Tracy Power Plant, located 1-mile south. Only two prior projects have been conducted within the proposed project area under the jurisdiction of the BLM. The two projects include a reconnaissance for a 230 kilovolt (kV) transmission line right-of-way for the Sierra Pacific Power Company (Report CRR 2-083) and a 345 kV line project for the proposed “Tuscarora 2002 Expansion Project/White Horse to Tracy (Report CRR 3-2038)” through California and Nevada. Neither project resulted in the identification of archaeological sites within the project area.

Table 1. Previous Projects within a 1-mile radius.

Agency Report No.	NSM Report No.	Title	Author	Date
*CRR 2-083	18-9	Report of Archaeological Reconnaissance Along Proposed 230 kV Transmission Line Right-of-Way of Sierra Pacific Power Company, Part I, Tracy, Nevada to Valmy, Nevada	Rusco, Mary and Evelyn Seelinger	1974
CRR 3-0102	18-18	Proposed Access Roads to Reroute of Sierra Pacific Power Company's Tracy to Oreana 230 kV Powerline	Clerico, Bob	1976
CRR 3-342	18-72	Class III Cultural Resources Inventory of the Sierra Pacific Power Company's Transmission Line Corridor: Valmy to Mira Loma, Nevada (from NADB)	Busby, Colin I., J. C. Bard, B. Dawson, and P. H. Ogrey	1979
CRR 3-236(P)	16-86	Cultural Resources Report Field Worksheet: Tracy-Valley Road 345 kV Line: Cr Report #: 3-236(P) (from NADB)	Harrigan, William A.	1978
CRR 3-0657	16-113	Archaeological Reconnaissance of Existing and Proposed Roadways for the Patrick Development Lower Pah-Pah Mountains, Washoe County, Nevada: A Cultural Resources Report (from NADB)	Johnson, David S.	1981
CRR 3-0470	16-192	Material and Testing Survey Patrick Area	Tomlinson, G.	1979
CRR 3-0822	16-238	Cultural Resources Report: Phillips Petroleum Company - NOI for Geothermal Exploration in	Moore, R. K.	1983



Table 1. Previous Projects within a 1-mile radius.

Agency Report No.	NSM Report No.	Title	Author	Date
		the Truckee River Valley: Cr Report No.: 3-822(N) (from NADB)		
CRR 3-0922	16-263	Cultural Resource Report: Betterment Along I-80 from 1.4 Miles West of Patrick to Painted Rock, E.A. 71168 (from NADB)	Bunch, James H.	1984
CRR 3-0947	16-271	Cultural Resources Report: Survey of Clark Station Old Highway 40 Alignment, E.A. 71124 (from NADB)	McNeil, J.	1983
CRR 3-996	16-285	Cultural Resource Survey of the Proposed Patrick Reroute Transmission Line, Washoe County, Nevada (from NADB)	Peak, Ann S.	1985
CRR 3-0435	18-288-1	Archaeological Survey of 12.6 miles of Pipeline and four valve assembly locations	Frank Johnson, Lizzie Lundemo	1980
CRR 3-1011	16-289	An Intensive Archaeological Survey of the Tracy Development - BLM Land Exchange	Juell, K	1985
CRR 3-1011	16-289-1	Reexamination of 15 Prehistoric Sites in SE Spanish Springs Valley	Markos, J	
CRR 3-1011	16-289-2	Evaluation of Archaeological Sites 26Wa3236 and 26Wa3308 in the Truckee River Canyon	Drews, M	1985
CRR 3-1107	16-331	An Archaeological Reconnaissance of Proposed Fiber Optic Cable Construction for Nevada Bell	Stornetta, S.	1987
CRR 3-1427	16-520	NDOT Cultural Resources Report: Proposed Haul Road, near the Patrick Exit.	Sterns, S.	1991
**	16-710	An Archaeological Inventory of a 170 Acre Area for the 102 Ranch Mine, along I-80, Washoe County, Nevada	Martin, M.	1995
CRR 3-1583	16-751	Cultural Resources Assessment Report: Tuscarora Pipeline Project : Phase I" Survey, Inventory, and Preliminary Assessment of Cultural Resources	Price, B	1994
CRR 3-1583 B	16-766	Malin to Tracy: Ancillary surveys along the Tuscarora Pipeline, Oregon to Tracy NV - addendum	Glover, L	
**	16-768	Supplemental Surveys and Test Investigations for Tuscarora Pipeline Reroutes and Ancillary Area, From Malin, Oregon to Tracy, Nevada: Part II	Glover, L., et al	1996
CRR 3-1960	16-903	BLM Cultural Resources Inventory Negative	Raffetto, P.	1999



Table 1. Previous Projects within a 1-mile radius.

Agency Report No.	NSM Report No.	Title	Author	Date
		Report: Spanish Springs Well Haul Site		
*CRR 3-2038	16-975	A Class III Cultural Resources Inventory for the Proposed Tuscarora 2002 Expansion Project/White Horse to Tracy 345 kV Line Project, California and Nevada.	McGuire Kelly R. and D. Craig Young	2001
**	KEC-361-3	Tracy Power Plant Survey	Kautz	2005
**	DBI_NV_2007_208	A Cultural Resources Inventory Along the Truckee River Canyon, Near the Tracy Power Plant, Washoe County, Nevada	Simons, Dwight D.; Risse, Danielle; and Robert R.	2007
CRR 3-2113	**	A Class III Cultural Resources Inventory of Six Alternative Routes for the Proposed Tracy/Silver Lake 120 kV Transmission Line, Washoe County, Nevada.	Young, D.C. and K.R. McGuire	2003
CRR 3-2113-1	**	Historic Resource Evaluation and Treatment Plan for the Calle de la Plata APE of the Tracy to Silver Lake 120 kV Transmission Line	Young, D.	2005
CRR 3-2365	DBI_NV_2007_438	A Class III Cultural Resources Inventory of the Truckee River Restoration Project, Washoe and Storey Counties, Nevada	Ross-Hauer, J.	2007
CRR 3-2419	**	A Cultural Resource Summary for the Olinghouse Term Grazing Permit Renewals	Lane, Elizabeth	2008
CRR 3-2423	**	A Cultural Resource Inventory for an American Ready Mix Materials Pit, Washoe County, Nevada	Hall, Jeremy and Michael Drews	2008
CRR 3-2423-1	**	Addendum to a Class III Cultural Resources Inventory for the Western Nevada Materials Pit Expansion, Near Tracy, Washoe County, Nevada	Hall, Jeremy	2008
**	**	A Class III Cultural Resource Inventory of 276 Acres along the Lower Truckee River for the West McCarran/Tracy Ecosystem Restoration Project, Storey and Washoe Counties, Nevada Nature Conservancy	Giambastiani, Dayna; and Leslie Fryman	2012
CRR 3-2534	**	A Class III Cultural Resource Inventory of the Nevada Wind/Virginia Peak Road and Transmission Line, Washoe County, Nevada	Chambers Group, Inc.	2008
CRR 3-2549	**	Cultural Resources Inventory for Sierra Pacific Power Company's 105 Line Rebuild Project in Washoe County, Nevada	McCabe, Allen	2008



*Located within project area.

** Information not available or relevant.

Table 2. Previous sites within a 1-mile radius.

State No. (26Wa)	Agency No.	Project Inventory	Temporal affiliation/ type	Description	Eligibility and Criteria
WA2686	CrNV-31-1217	16-975	Prehistoric	Prehistoric ground stone assemblage	Unevaluated
WA3236	CrNV-31-76	CRR 3-1011/16-8 and 16-289-1&2	Prehistoric	Lithic scatter	Unevaluated
WA3304	CrNV-31-3540	CRR 3-1011/16-289-1	Prehistoric	Lithic scatter	Unevaluated
WA3305	CrNV-31-3541	CRR 3-1011/16-289-1	Prehistoric	Lithic scatter	Unevaluated
WA3306	CrNV-31-3542	CRR 3-1011/16-289-1	Prehistoric	Lithic scatter	Unevaluated
WA3307	CrNV-31-3543	CRR 3-1011/16-289-1	Prehistoric	Lithic scatter	Unevaluated
WA3308	CrNV-31-3544	CRR 3-1011/16-289-1&2	Prehistoric	Lithic scatter	Significant
WA5241	**	16-520	Historic	Historic artifact scatter with features including trail.	Ineligible
WA5614	CrNV-31-4589	CRR 3-1583/16-751	Prehistoric	Lithic scatter	Ineligible
**	CrNV-03-5805	TSL-62	Unknown	**	**
WA7915	CrNV-03-5807	DBI_NV_2007_208	Prehistoric/Historic	Lithic scatter and historic linear features	Ineligible
WA7915	CrNV-03-5807	DBI_NV_2007_208	Prehistoric/Historic	Lithic scatter with ground stone and historic refuse scatter	Eligible
WA7916	**	KEC-361-3	Prehistoric	Lithic scatter	Ineligible
WA8202	**	569-1	Historic	Two track road	Ineligible
WA8203	CrNV-03-5815	CRR 3-2113/ DBI_NV_2007_208 and DBI_NV_2007_438	Historic	Two segments of the Hill Ditch irrigation ditch	Ineligible
WA8204		DBI_NV_2007_208	Historic	Artifact scatter and pipe	Ineligible



Table 2. Previous sites within a 1-mile radius.

State No. (26Wa)	Agency No.	Project Inventory	Temporal affiliation/ type	Description	Eligibility and Criteria
WA8205	CrNV-03-5484	DBI_NV_2007_208	Historic	Central Pacific Railroad grade	Eligible
WA8206	CrNV-03-5803	DBI_NV_2007_208	Prehistoric/Historic	Lithic scatter with ground stone and historic refuse scatter with prospect trench	Ineligible
WA8304	CrNV-03-6451	CRR 3-2365	Historic	Debris scatter	Ineligible
WA8305	CrNV-03-6452	CRR 3-2365	Prehistoric	Lithic scatter	Ineligible
WA8306	CrNV-03-6453	CRR 3-2365	Prehistoric	Lithic scatter	Ineligible
WA8598	CrNV-03-6130	CRR 3--2423	Historic	Small historic can scatter	Ineligible
**	CrNV-03-5799	TSL-56	Unknown	**	**
**	CrNV-03-5807	TSL-64	Unknown	**	**
**	CrNV-03-5808	TSL-65	Unknown	**	**
**	CrNV-03-5711	KC-10	Unknown	**	**
**	**	I-55	Unknown	**	**
**	**	I-56	Unknown	**	**
**	CrNV-03-5805	TSL-62	Unknown	**	**
**	**	I-11	Unknown	**	**
**	**	I-12	Unknown	**	**
**	**	I-56	Unknown	**	**
**	**	I-55	Unknown	**	**
**	CrNV-03-5807	TSL-64	Unknown	**	**
**	CrNV-03-5808	TSL-65	Unknown	**	**
**	CrNV-03-5711	KC-10	Unknown	**	**
**	**	I-11	Unknown	**	**
**	**	I-12	Unknown	**	**
**	CrNV-3-5484	**	Historic	**	**



*** Information not available or relevant.*

State and National Register Properties – A review of the NR revealed one property listed within 1-mile of the project area, the Derby Dam listed on the NR on the 26th of April 1978 (NRIS No. 78001727). No additional properties are listed on the NR or historic districts located within 1-mile of the project area.

Historic Maps – A search of the historic maps (Table 3) revealed the presence of one GLO map for Township 20 North, Range 22 East dating to 1865 (Figure 2). The map depicts a trail or road located in the southern half of Section 28 approximately 1-mile south of the project area. The historic Spanish Springs Valley, 1:62,500-scale topographic map dating to 1957 depicts a transmission line as bisecting the lower half of Section 21 within the project area (Figure 2). No other potential historic features were identified in the background records search.

Table 3. Historic maps within 1-mile of the project area.

Map Name	Map Year	Features within 1-mile	Within APE
Township 20 North, Range 22 East Plat Map	1865	Road or trail along north side of Truckee in lower half of Section 28	No
Spanish Springs Valley, 1:62,500 scale topographic map	1957	Transmission line bisects Section 21	Yes

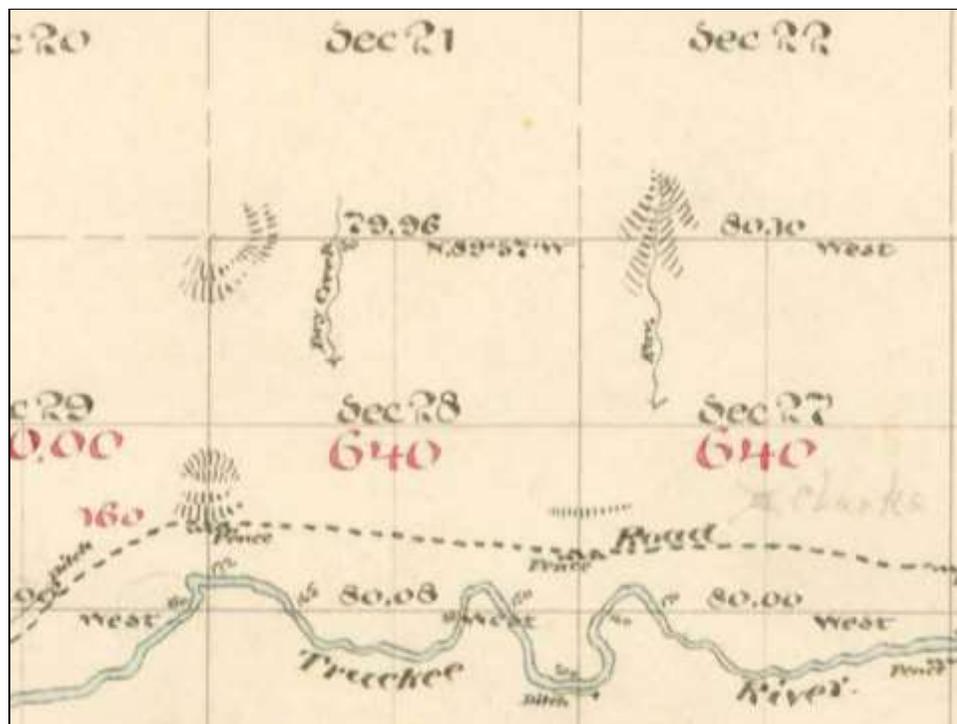


Figure 2. A GLO map for Township 20 North, Range 22 East dating to 1865 depicts a road or trail along north side of Truckee River.

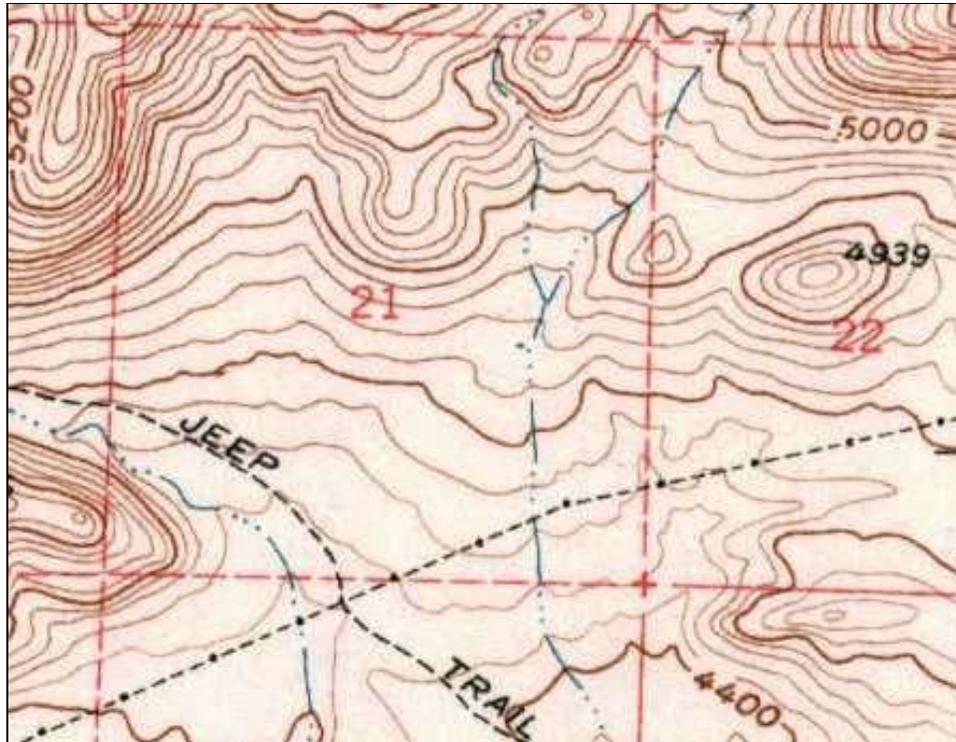


Figure 3. Transmission line represented within the project area on the Spanish Springs Valley, 1:62,500 scale topographic map.

Findings

In summary, the record search did not reveal potential significant issues with respect to biological or cultural resources.

Biological – The sand cholla (*Grusonia pulchella*) was identified as having potential habitat in the project area by NNHP, however no actual species sightings are recorded. Also, the Reno Technology Park environmental review site visit, conducted by Redhorse on May 6, 2011, revealed no sand cholla. The sand cholla is not subject to surveys on private land. The State of Nevada Native Plant Laws (Nevada Revised Statutes 527.050 through 527.120) focus mainly on prohibiting the harvesting or collection of cactus.

The Lahontan cutthroat trout and cui-ui that occur within the Truckee River system are listed as Federally Threatened and Federally Endangered species respectively and occur within the Truckee River. A few ephemeral drainages cut across the project area draining the lower slopes of the Pah Rah Range to the Truckee River. The project will be required to obtain a Storm Water Pollution Prevention Plan (SWPPP) as well as a Storm Water Discharge Permit from the NDEP prior to any land clearing activities. Requirements of a SWPPP will control potential sediment and contaminants in discharges that could potentially affect the Truckee River. Therefore, it is not anticipated that the project would increase



sedimentation loading to the river, or contribute appreciable pollutant discharges to the river in a manner that would affect listed fish populations.

Cultural – Overall, the potential for archaeological, prehistoric or historic resources are low considering the project area is located on a steep slope approximately 1-mile north of the Truckee River corridor. No NR properties are located within the project area or historic districts located within 1-mile of the project area. Two prior archaeological investigations have been conducted within the project area; however neither project resulted in the identification of archaeological sites within the project area.

The background record search identified the presence of a historic transmission line, more than fifty years in age, which bisects the lower half of the proposed project area (Figure 3). The background records search suggests a high potential for historic era utility lines within the project area.

According to Julie Ernstein, Deputy State Historic Preservation Officer (correspondence via telephone on April 6, 2015), if the project falls under federal oversight, for instance with the US Army Corps of Engineers, it would become subject to review by the Nevada State Historic Preservation Office (SHPO). SHPO will require the significance of the resource to be evaluated in the field by a qualified archaeologist if standing historic architectural elements are present within the project area, such as historic era utility. However, since this project does not require federal oversight it is not subject to review by SHPO.

Appendix A

NNHP Correspondence



Colleen Lavery <colleen.lavery@redhorsecorp.com>

data request

2 messages

Colleen Lavery <colleen.lavery@redhorsecorp.com> Fri, Mar 27, 2015 at 3:11 PM
To: "emiskow@heritage.nv.gov" <emiskow@heritage.nv.gov>

Hello Eric,

Attached is a data request form for a list of at-risk species.

The project area encompasses approximately 525 acres and is south of the Pah Rah Mountain Range. It is located in Township 20 North (T. 20N), Range 22 East (R. 22E) Section 21, Mount Diablo Meridian.

Thanks!

Sincerely,

Colleen Lavery
NEPA Specialist/Project Manager
Redhorse Corporation
1755 East Plumb Lane
Reno, NV 89502
Cell (775) 671-5662
colleen.lavery@redhorsecorp.com
www.redhorsecorp.com



NNHP Data Req form filled out.jpg
1133K

NEVADA NATURAL HERITAGE PROGRAM DATA REQUEST FORM

rev. PDF 2013

Use this form to query the Nevada Natural Heritage Program database for location information of at-risk species. Please fill out this form as completely and specifically as possible, attaching additional sheets as needed. For more information on available species and data fields, fees, limitations, and restrictions, please visit our web site <<http://heritage.nv.gov>> or contact us for printed information. We cannot guarantee our response time; normal time is about two weeks, and we will strive to (and usually can) meet more urgent deadlines.

Date signed: 3/27/2015 **Date needed:** April 3, 2015 if possible

Organization: Redhorse Corporation

Mailing Address: 1755 E Plumb land, Reno, NV 89502

Phone: 775-671-5662 **FAX:** **email:** colleen.lavery@redhorsecorp.cpm

Project or Site Name: Turquoise Solar Project

How will the information be used? supplemental information for a Washoe County Special Use Permit

Standard (one-time), **Annual Subscription:** **first year** **continuation**

KIND OF SEARCH

(see current fee schedule <<http://heritage.nv.gov/fees.htm>> for descriptions, costs, and examples)

LIMIT SEARCH BY THE FOLLOWING CRITERIA

(check or complete all that apply to ensure you purchase only the records you want)

Location (please specify by township-range-section, map quadrangle, watershed, or other boundaries, and attach map(s) when possible; for GIS requests, submit polygon(s) of area(s) in UTM Zone-11 meter coordinates, NAD27 datum, as ArcView® shapefiles if possible):

The project area encompasses approximately 525 acres and is south of the Pah Rah Mountain Range. It is located in Township 20 North (T. 20N), Range 22 East (R. 22E) Section 21, Mount Diablo Meridian.

Shapefile attached? No

Species: all plants all animals all vertebrates all invertebrates

other (specify groups/taxa):

Status: all at-risk all federal T/E/candidate all state T/E all watch-list

Additional Limiting Criteria (please specify; see data catalog <<http://heritage.nv.gov/datafids.htm>> for searchable fields):

FORMAT AND CONTENT OF SEARCH RESULTS

(see fee schedule <<http://heritage.nv.gov/fees.htm>> and data catalog <.../datafids.htm> for format descriptions and available fields)

Standard Summary Records (name, status, location, precision, date), specify: printed ASCII text file

OR Complete or Customized (enter desired fields below) **Records**, specify: printed ASCII text file

OR ArcView® GIS shapefiles (complete records only), specify: _____

projection (none=UTM Zone-11 meters): _____

datum (blank=NAD27): _____

Custom Fields (enter names or types of ALL data fields to include for custom records): _____

HOW YOU WANT THE RESULTS SENT

Please Send: search results immediately cost estimate first exact cost first

Send by any of the following checked methods: U.S. Mail FAX email FedEx

For FedEx, include PHYSICAL address above, and specify account to charge:

BY SIGNING BELOW, I acknowledge that I have read and agreed to abide by the Nevada Natural Heritage Program's (NNHP's) current fee schedule <<http://heritage.nv.gov/fees.htm>> and its data limitations and restrictions <.../limitats.htm> (contact us for printed copies). I also agree that (1) all data supplied, and the analytic tools and processes from which they are derived, are the privileged, confidential property of NNHP, and/or The Nature Conservancy, Inc., and/or those who supplied the data to NNHP, and will not be provided to any other party without our consent; (2) in any use of the data, NNHP will be cited as a source, along with the year and month it supplied the data; and (3) while NNHP strives for accuracy and completeness, the data it supplies depend on the observations and research of many individuals and organizations, new data are constantly received, and in no case will the data be represented as a complete survey of any species or area.



Signature

Colleen Lavery

Name (please print)

NEPA Specialist

Title

Please MAIL or FAX completed and signed form to: Nevada Natural Heritage Program, attn: Data Manager, 901 S Stewart St, suite 5002, Carson City NV 89701-5245. FAX (775) 684-2909, phone (775) 684-2905.



STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
Nevada Natural Heritage Program

Brian Sandoval
Governor

Leo Drozdoff
Director

Jennifer Newmark
Administrator

30 March 2015

Colleen Lavery
Redhorse Corporation
1755 E. Plumb Lane
Reno, NV 89502

RE: Data request received 27 March 2015

Dear Ms. Lavery:

We are pleased to provide the information you requested on endangered, threatened, candidate, and/or at risk plant and animal taxa recorded within or near the Turquoise Solar Project area in Washoe County. We searched our database and maps for the following, a two kilometer radius around:

Township 20N Range 22E Section 21

There are no at risk taxa recorded within the given area. However, habitat may be available for, the sand cholla, *Grusonia pulchella*, a Taxon determined to be Imperiled by the Nevada Natural Heritage Program. The Lahontan cutthroat trout, *Oncorhynchus clarkii henshawi*, a Federally Threatened Taxon, the cui-ui, *Chasmistes cujus*, a Federally Endangered Taxon, and the California floater, *Anodonta californiensis*, a Nevada Bureau of Land Management and a United States Forest Service (Region 5) Sensitive Species, occur in the Truckee River and should be considered if disturbances are anticipated in the area. The Nevada Department of Wildlife (NDOW) manages, protects, and restores Nevada's wildlife resources and associated habitat. Please contact Bonnie Weller, NDOW GIS biologist (775) 688-1439 to obtain further information regarding wildlife resources within and near your area of interest. Removal or destruction of state protected flora species (NAC 527.010) requires a special permit from Nevada Division of Forestry (NRS 527.270).

Please note that our data are dependent on the research and observations of many individuals and organizations and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the taxa or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for checking with our program. Please contact us for additional information or further assistance.

Sincerely,

Eric S. Miskow
Biologist III/Data Manager

eric Miskow <emiskow@heritage.nv.gov>

Mon, Mar 30, 2015 at 6:17 PM

To: Colleen Lavery <colleen.lavery@redhorsecorp.com>

Hi Colleen,

Please find the data request for the Turquoise Solar Project attached. I place a hard copy in the terrestrial mail. Let me know if you have any questions.

Best Regards,

Eric

Eric Miskow

Biologist/Data Manager

Nevada Natural Heritage Program

Department of Conservation and Natural Resources

901 S. Stewart Street, Suite 5002

Carson City, NV 89701-5245

(775) 684-2905 (voice)

(775) 684-2909 (fax)

emiskow@heritage.nv.gov

From: Colleen Lavery [mailto:colleen.lavery@redhorsecorp.com]

Sent: Friday, March 27, 2015 3:12 PM

To: eric Miskow

Subject: data request



Department of Conservation and Natural Resources

Nevada Natural Heritage Program

Grusonia pulchella

Taxonomy

Scientific Name: *Grusonia pulchella*

Common name: sand cholla

Family: Cactaceae **Minor Group:** Dicot **Major Group:** Vascular Plant

Rank and Status

Global Rank: G4 **Endemic:** No **Native Status:** Native

Subnational (State) Rank: S2S3 **Sand Dunes:** Yes

NNHP Track Status: At-Risk List **Wetland:** No

Other Agency Status	Status	Last Updated	Status Comments
---------------------	--------	--------------	-----------------

Bureau of Land Management - Nevada	Sensitive		2011 BLM List
------------------------------------	-----------	--	---------------

State of Nevada Protected	Protected as a cactus, yucca, or Christmas tree		
---------------------------	---	--	--

Nevada Native Plant Society	Dropped, no longer of concern		
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Distribution (NV Counties)

Status: Confident or certain

Churchill	Douglas	Elko	Esmeralda
Humboldt	Lander	Lyon	Mineral

Nye

Pershing

Storey

Washoe

White Pine

Status: Possible

Lincoln

Summary Occurrence Data

Occurrence Count:	37
Last Observed:	2002
Total Observed Area (hectares):	176
Maximum Known Elevation (m):	1530
Minimum Known Elevation (m):	1204

Links

[Grusonia pulchella data at NatureServe](#)(link is external)

[Grusonia pulchella photos and data at Encyclopedia of Life](#)(link is external)

Reports

[Nevada Rare Plant Atlas](#)

[Nevada Rare Plant Atlas Maps](#)

Character Abstract

Identification

Comments:

Subspecies

Comments:

Lookalikes:

Phenology

Comments:

Flowering mostly mid-May to mid-June.

Reproduction

Character Abstract

Comments:

Habitat Comments: Dry, open, loose, mostly sandy soils, sometimes gravelly or rocky (especially carbonate) soils, of valley floors and gentle slopes in the shadscale, mixed shrub, sagebrush, and lower pinyon-juniper zones.

Ecology

Comments:

Inventory Comments: Not yet systematically surveyed in Nevada.

Inventory Needs:

Version Date:

Images:



whole plant in flower
Photographer: Copyright Gary Monroe,
Nevada Native Plant Society
Photo Date:



close-up of flower
Photographer: Copyright Gary Monroe,
Nevada Native Plant Society
Photo Date:



Large *Grusonia pulchella* plant with
small *Echinocereus englemannii*
Photographer: Janel Johnson, for US
Forest Service
Photo Date: 2004-05-27

BLM Correspondence



Colleen Lavery <colleen.lavery@redhorsecorp.com>

wild horse and burro due diligence

3 messages

Colleen Lavery <colleen.lavery@redhorsecorp.com> Wed, Mar 25, 2015 at 3:33 PM

To: jaxtell@blm.gov

Hello John,

I'm working on the planning aspect for a 60 MW solar project that is part of the Reno Technology Park energy plan where Apple is going in. It's a small project, so it falls under a Special Use Permit with Washoe County.

As a courtesy, I am conducting biological due diligence and wanted to touch base with you to request any insight you may have that could apply towards Wild Horse and Burro avoidance measures while constructing this project and beyond.

The project is adjacent to steep terrain and is located north of I-80, in Section 21, small portion of Section 22 to the east, and a small portion of Section 28 to the south. T20N, R22E.

I understand that the Horse Spring HA is located to the south and the Pah Rah Mountains HA is to the north. I also understand that according to the Carson City District BLM, current Draft RMP that "Currently the Pah Rah Mountains and Horse Springs HAs, as well as the southern portion of the Pine Nut Mountains HA, are not managed for wild horses due to a checkerboard pattern of public and private land that makes management unfeasible in these areas. All wild horses were removed from the Pah Rah Mountain Range in 1984. Since 1984, however, some horses have moved over from the Pyramid Lake Indian Reservation. Substantial areas of the Pah Rah Mountains consist of steep terrain with limited road access, so capture attempts have not kept up with immigration and reproduction; therefore, a population of horses currently occupies the Pah Rah Mountains. These horses are classified as stray animals under Nevada State Laws and are not wild horses under the Wild Horse and Burro Act; therefore, they are not managed by the BLM."

Any insight you can lend me would be greatly appreciated.

Thanks!

Sincerely,

Colleen Lavery
NEPA Specialist/Project Manager
Redhorse Corporation
1755 East Plumb Lane
Reno, NV 89502
Cell (775) 671-5662
colleen.lavery@redhorsecorp.com
www.redhorsecorp.com



Axtell, John <jaxtell@blm.gov> Thu, Mar 26, 2015 at 6:17 AM
To: Colleen Lavery <colleen.lavery@redhorsecorp.com>, Brian Buttazoni
<bbuttazoni@blm.gov>

Hi Colleen, the horses north of I-80 (Pah RaHS) are not wild horses and therefore the BLM has no jurisdiction. Because of the checker board land pattern within the Pah Rah Herd Area, the BLM removed all wild horses in the mid 1980's, the horses there now (Pah Rah Mountains) are decedents of horses that originated from the Pyramid Lake Indian Reservation and do not fall under the Wild Horse and Burro Act. As an aside, unless solar panels some how prevented horses from accessing water I don't see how they would otherwise impact horses, but in this case they are not wild horses as defined by the act.

Sincerely,

John

[Quoted text hidden]

Colleen Lavery <colleen.lavery@redhorsecorp.com> Thu, Mar 26, 2015 at 2:41 PM
To: "Axtell, John" <jaxtell@blm.gov>

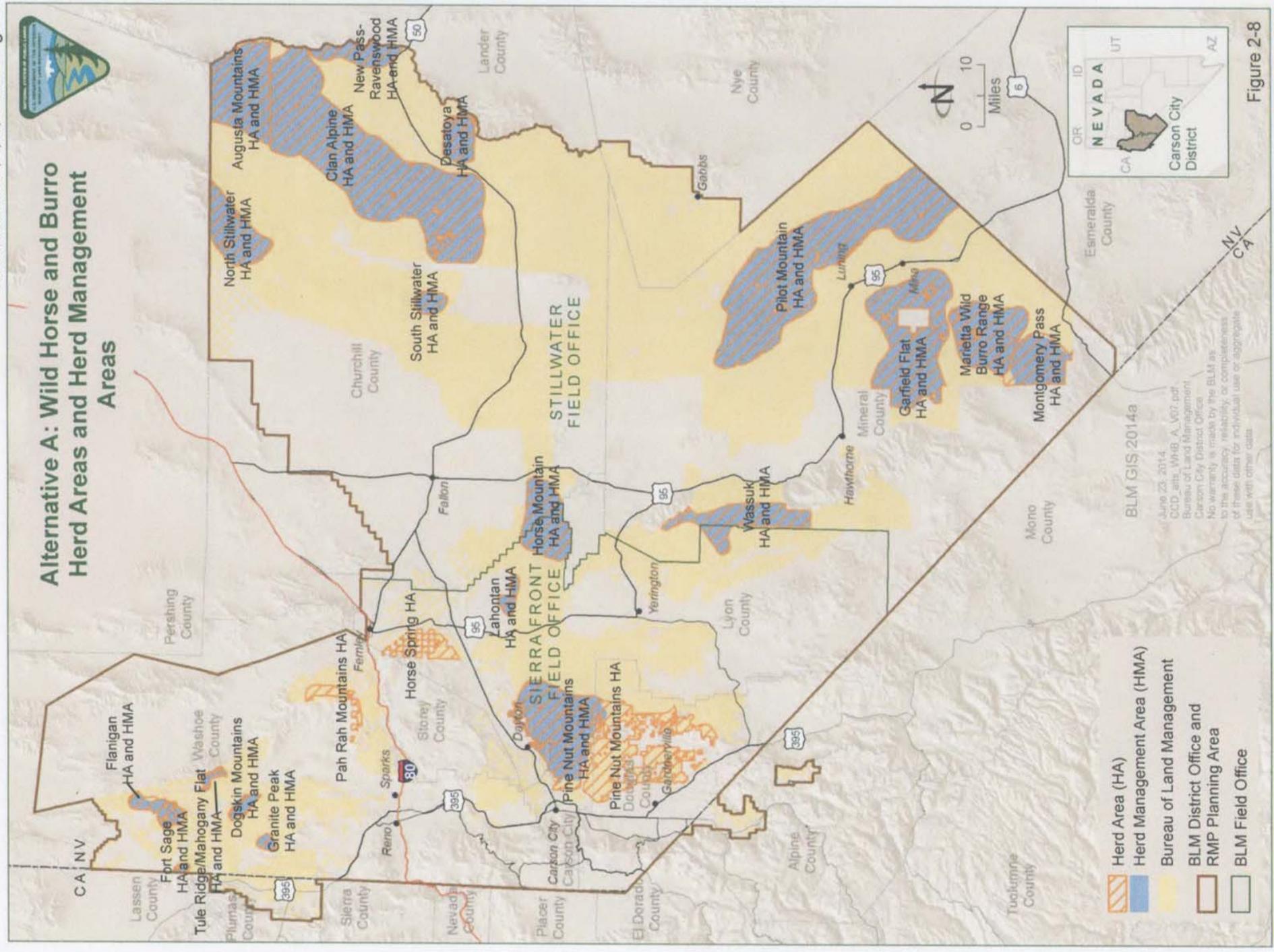
Thank you for confirming.
Much appreciated John.

Thanks!

Sincerely,

Colleen Lavery
NEPA Specialist/Project Manager
Redhorse Corporation

Alternative A: Wild Horse and Burro Herd Areas and Herd Management Areas



- Herd Area (HA)
- Herd Management Area (HMA)
- Bureau of Land Management
- BLM District Office and RMP Planning Area
- BLM Field Office

BLM GIS 2014a
 June 23, 2014
 GGD_att_WHB_A_V07.pdf
 Bureau of Land Management
 Carson City District Office
 No warranty is made by the BLM as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

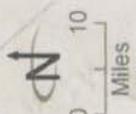


Figure 2-8

NDOW Correspondence

Cc: Chet VanDellen <cvandellen@ndow.org>, Bonnie Weller <bweller@ndow.org>

Dear Colleen,

I am forwarding your request to our GIS division for this data. They can provide you with the appropriate forms, and associated files for mule deer distribution and migration data.

Best Regards,

Cody Schroeder

Wildlife Staff Specialist – Game Division

Nevada Department of Wildlife

Email: cschroeder@ndow.org

Office: 775-688-1659

Cell: 775-233-2090

From: Colleen Lavery [mailto:colleen.lavery@redhorsecorp.com]

Sent: Wednesday, March 25, 2015 4:26 PM

To: Cody Schroeder

Subject: mule deer

[Quoted text hidden]

Colleen Lavery <colleen.lavery@redhorsecorp.com> Wed, Mar 25, 2015 at 5:25 PM



Colleen Lavery <colleen.lavery@redhorsecorp.com>

Nevada Department of Wildlife Data Request

1 message

Bonnie Weller <bweller@ndow.org>

Thu, Mar 26, 2015 at 9:54 AM

To: "colleen.lavery@redhorsecorp.com" <colleen.lavery@redhorsecorp.com>

Dear Ms. Lavery:

I believe that the data you require (mule deer distribution and NDOW hunt units) is available for download on our website at the following location:

<http://gis.ndow.nv.gov/ndowdata/>

We also have the NDOW Data Request Form on our website should you require additional information that is not available for download. An email copy of a completed request form plus an accompanying GIS shapefile or KML/KMZ file of the project area is required to process our standard data analysis requests. It can be downloaded at the following website location.

http://www.ndow.org/Nevada_Wildlife/Maps_and_Data/Data/

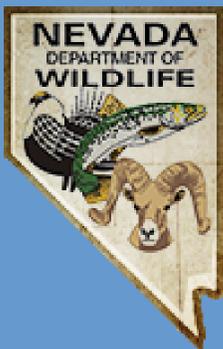
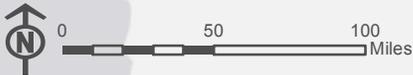
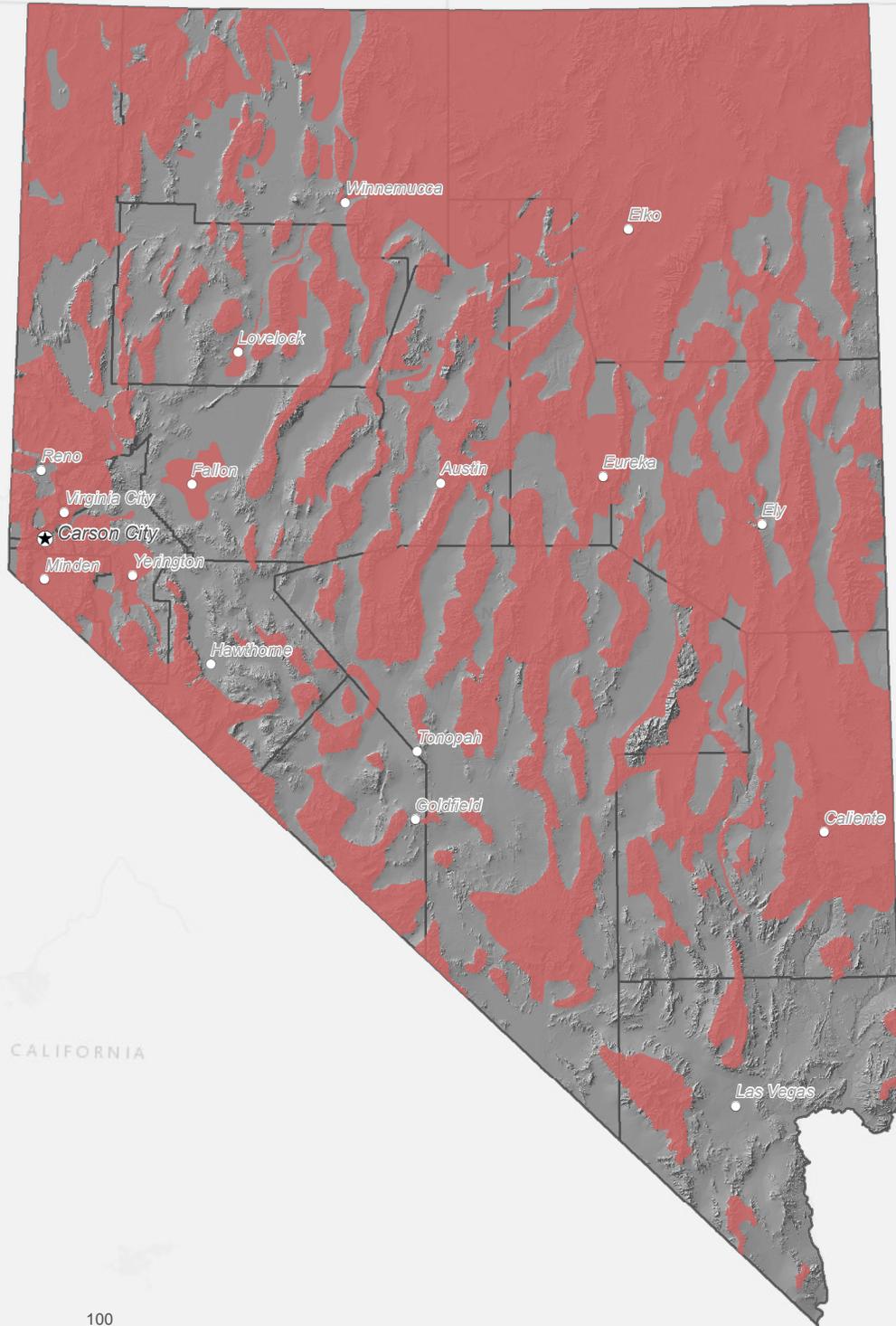
Please feel free to contact me if you have any additional questions or concerns.

Bonnie Weller

GIS Specialist/Biologist III

Nevada Department of Wildlife

Nevada Occupied Mule Deer Distribution

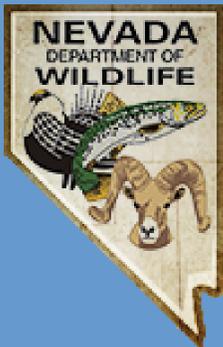
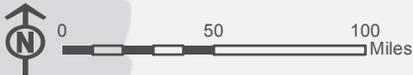
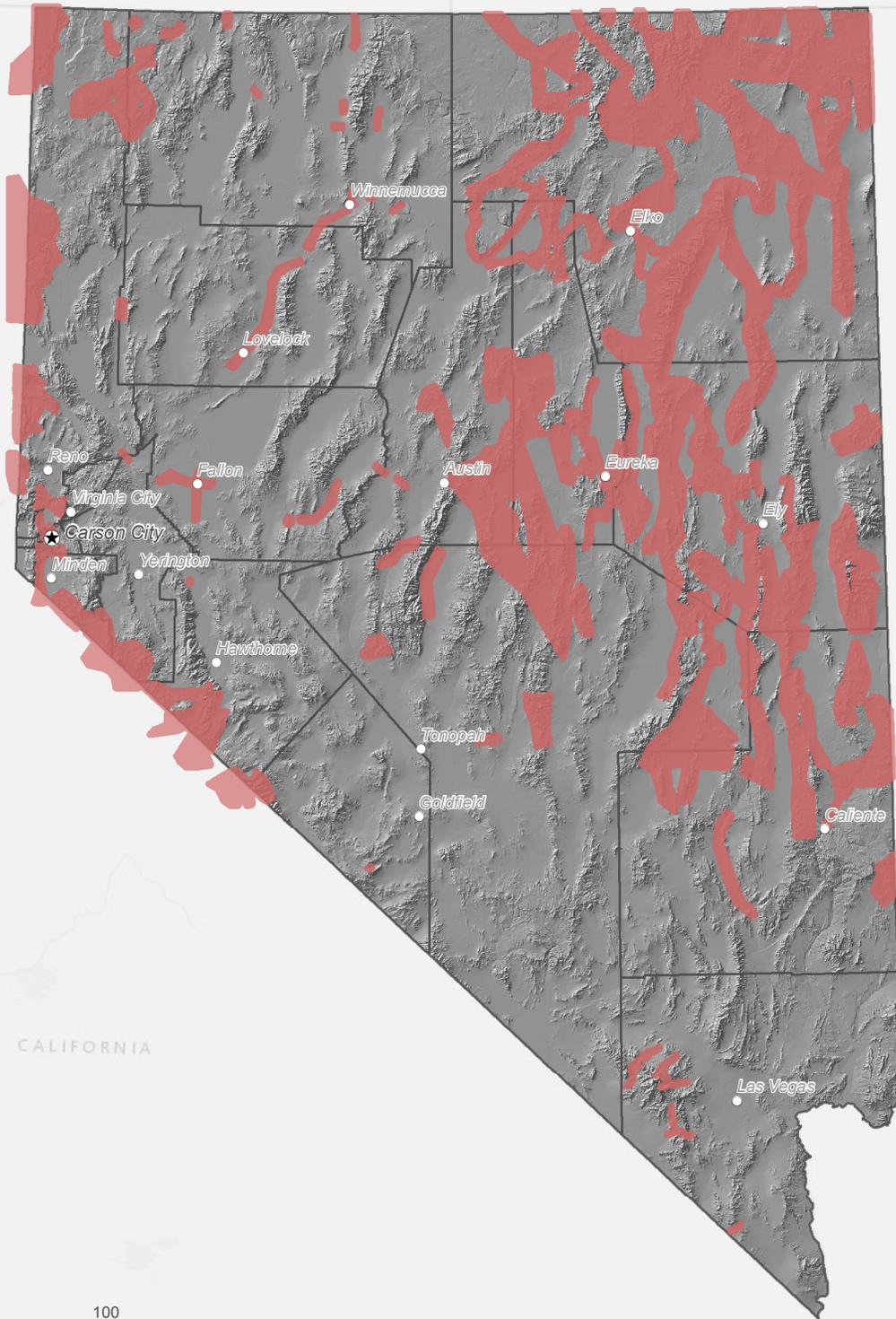


 Occupied Mule Deer Distribution (2014)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

10/6/2014
Projection: UTM Zone 11 North, NAD83

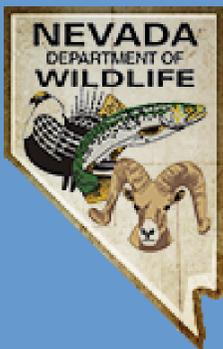
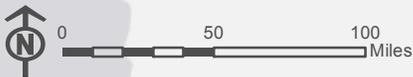
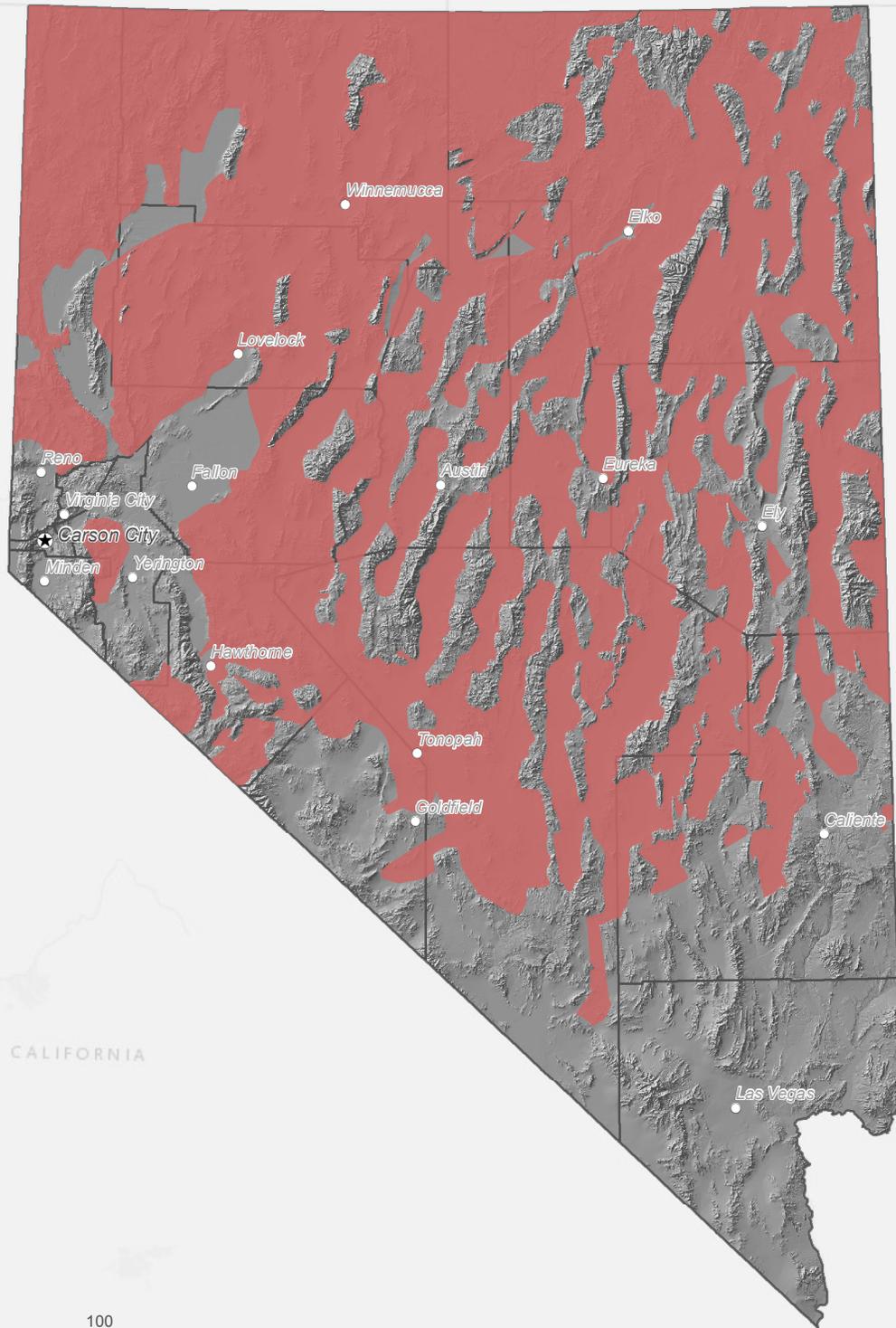
Nevada Mule Deer Movement Corridors



Mule Deer Movement Corridors (2013)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Nevada Occupied Pronghorn Antelope Distribution

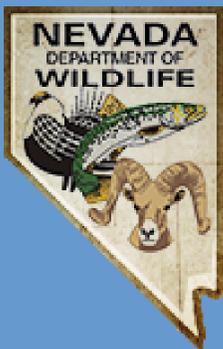
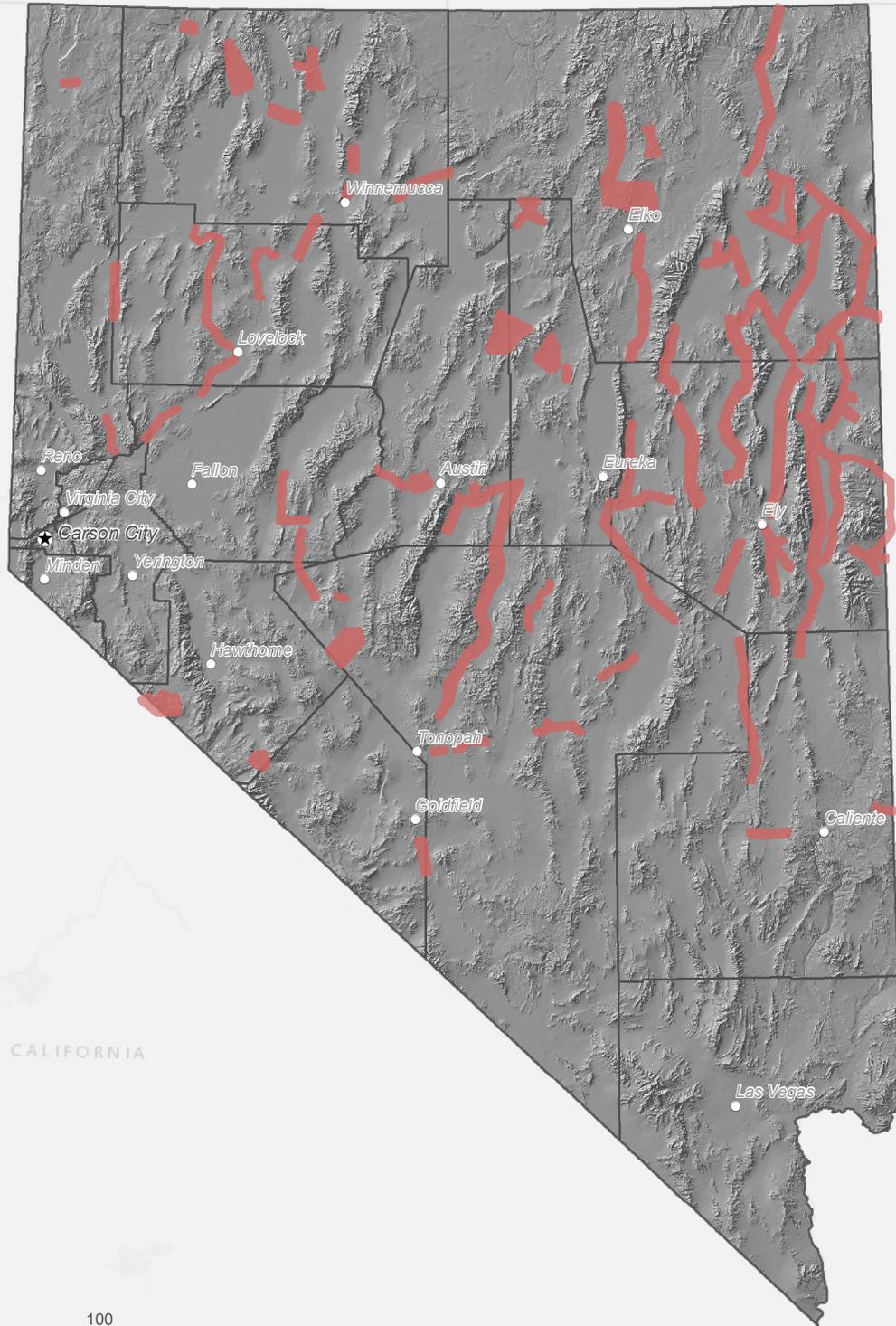


 Occupied Pronghorn Antelope Distribution (2010)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

10/6/2014
Projection: UTM Zone 11 North, NAD83

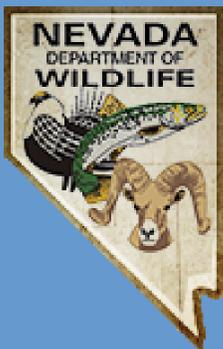
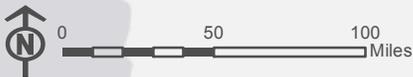
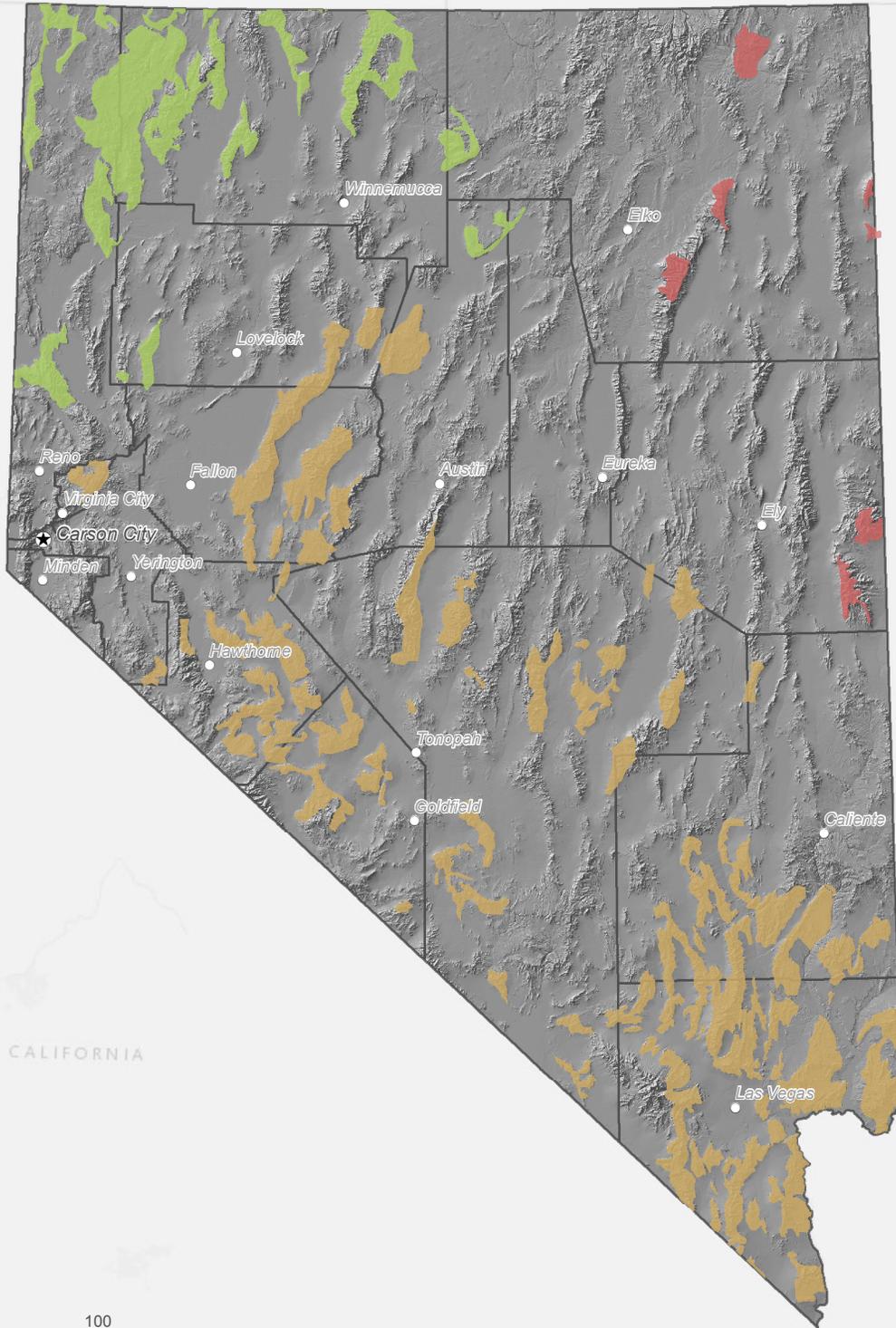
Nevada Pronghorn Antelope Movement Corridors



Pronghorn Antelope Movement Corridors (2004)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Nevada Occupied Bighorn Sheep Distribution

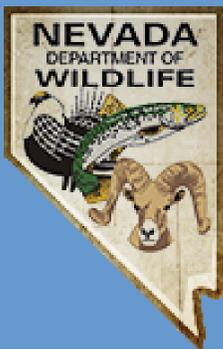
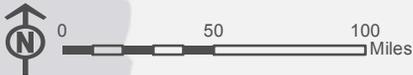
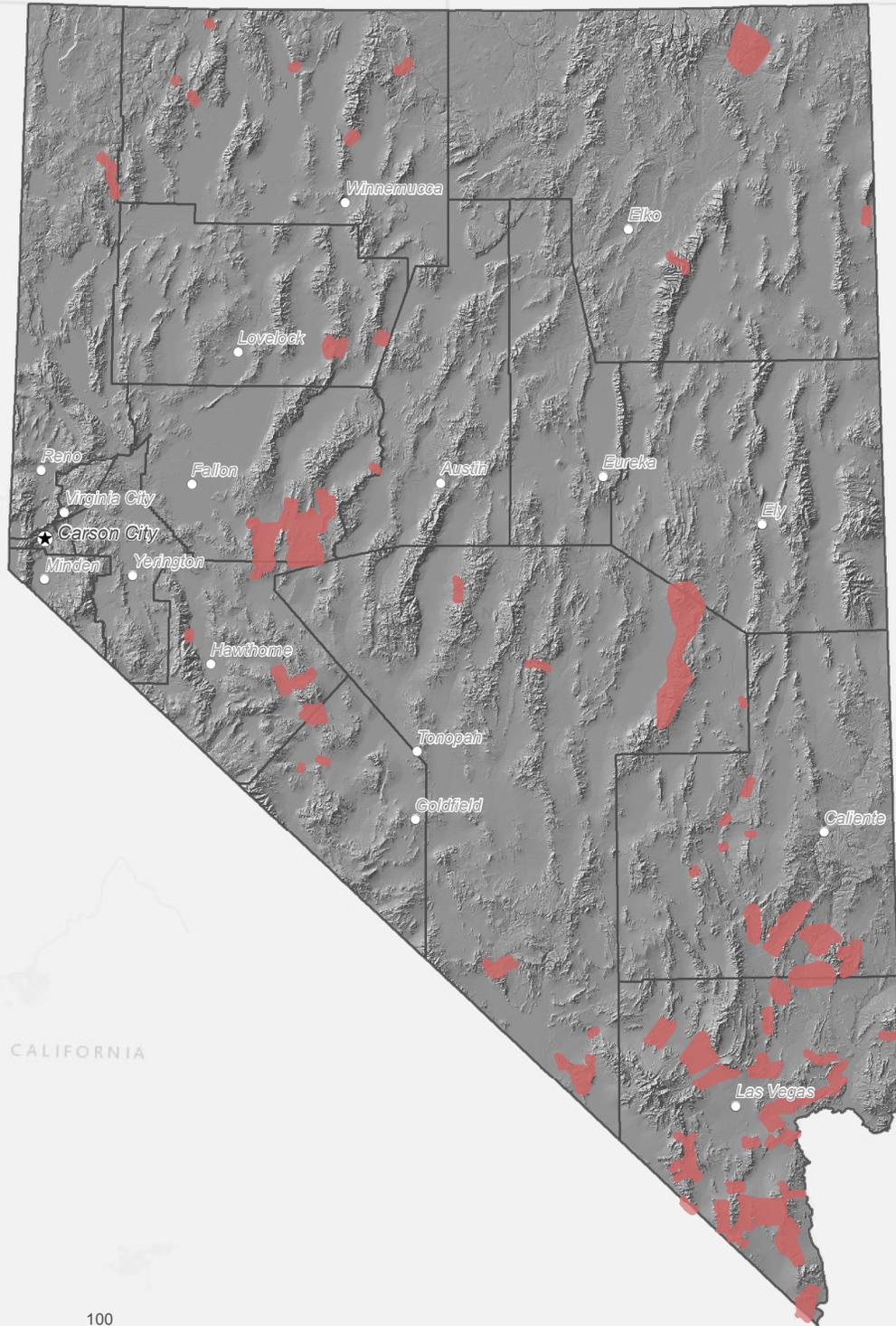


Occupied Bighorn Sheep Distribution (2014)

-  California (*Ovis canadensis californiana*)
-  Desert (*O. c. nelsoni*)
-  Rocky Mountain (*O. c. canadensis*)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

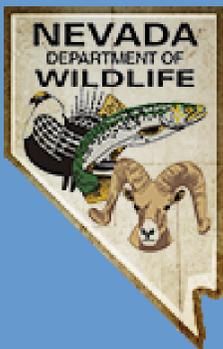
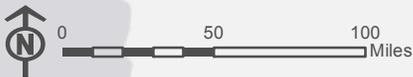
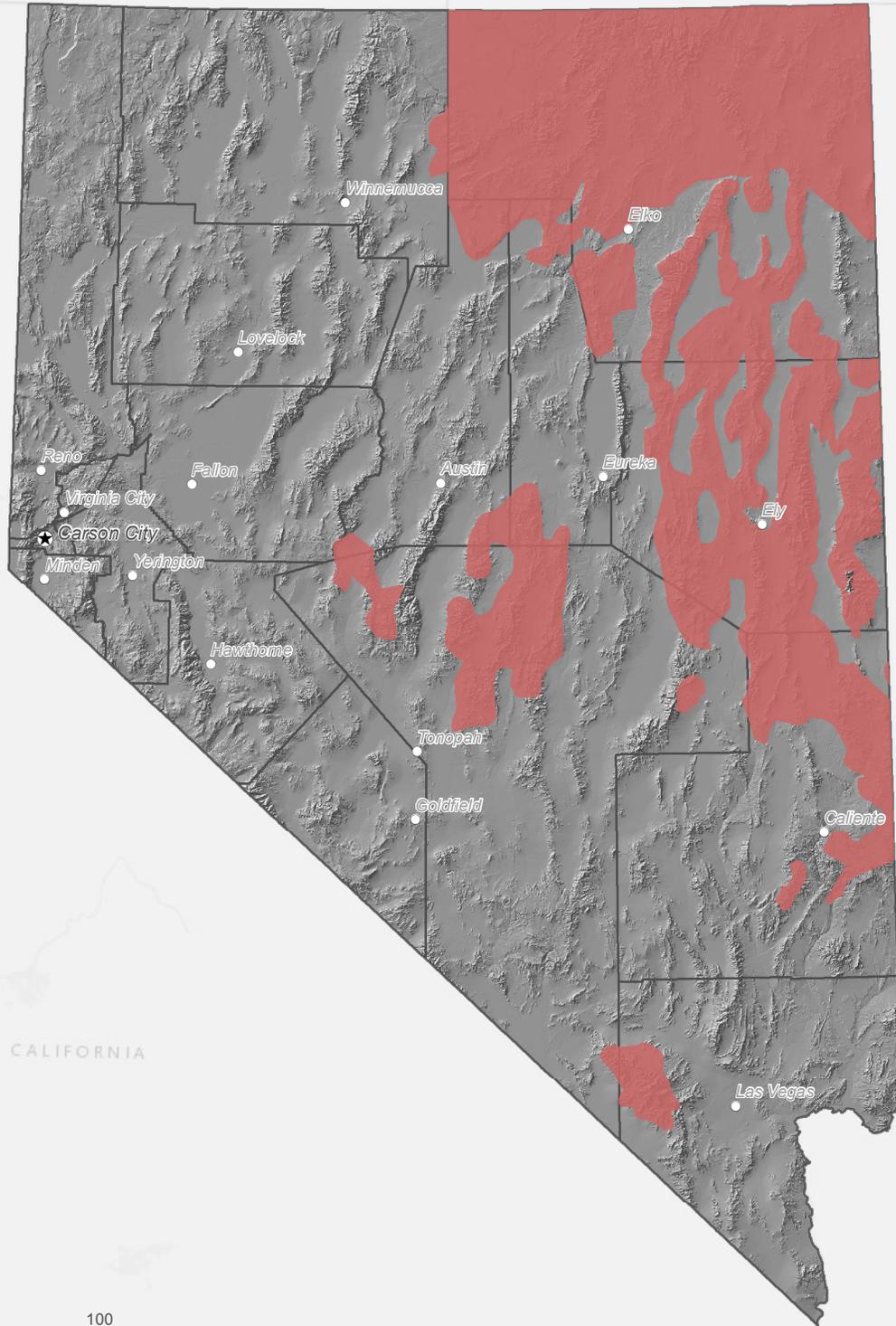
Nevada Bighorn Sheep Movement Corridors



Bighorn Sheep Movement Corridors (2010)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

Nevada Occupied Elk Distribution



 Occupied Elk Distribution (2013)

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

10/8/2014
Projection: UTM Zone 11 North, NAD83