Ely Energy Center

SIERRA PACIFIC RESOURCES

APPENDIX A9

AIR QUALITY IMPACT ANALYSIS

Prepared for:

SIERRA PACIFIC RESOURCES
6226 WEST SAHARA AVENUE
LAS VEGAS, NEVADA 89146

Submitted to:

STATE OF NEVADA
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL
901 SOUTH STEWART STREET, SUITE 4001
CARSON CITY, NV 89701-5249

Prepared by:

TETRA TECH EM INC.

TETRA TECH EM INC.
RENO, NEVADA 89502
(775) 322-0555

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1.0 INTRODUCTION

Sierra Pacific Resources (SPR) is proposing to build a new power generation plant, the Ely Energy Center (EEC), near Ely, Nevada, in White Pine County. The Sierra Pacific Power Company and Nevada Power Company will own and jointly operate the EEC. The EEC is a vital part of SPR's integrated resource plan for supplying electric power to meet Nevada's growing electrical demand. The proposed EEC will consist of a two-unit, pulverized coal-fired (PC) plant. The EEC will use a supercritical cycle and be designed to fire western sub-bituminous coal. Each unit will be rated at 750 megawatts (MW) nominal generating capacity. Ancillary plant equipment will include fuel and waste preparation and handling equipment; fuel and waste loading/unloading, transfer, and storage facilities; a distillate oil-fired auxiliary boiler; fire protection equipment; and backup generation facilities. All control equipment has been selected from a best available control technology (BACT) analysis. The EEC will be equipped with a continuous emissions monitoring system (CEMS) that will monitor and record pollutants as required under federal and state regulations.

The proposed EEC will be located in White Pine County, Nevada, near the community of Ely. The plant site will be primarily located in Sections 16, 17, 20, and 21 of Township 19 North, Range 64 East – Hydrographic Basin 179. The main stack of the proposed new generating station will be at Universal Transverse Mercator (UTM) coordinates 690,108 meters east and 4,374,813 meters north (Zone 11, North American Datum [NAD] 83). Figure 1-1 shows the proposed EEC location.

This air quality impact analysis (AQIA) has been completed by Tetra Tech EM Inc. for the Nevada Division of Environmental Protection (NDEP) in support of the application for a Class I Operating Permit to Construct in accordance with *Nevada Administrative Code* (NAC) 445B.289. This report summarizes the AQIA required air modeling, which has been rerun upon the acquisition of one full year of meteorological data.

The Class II area impact analyses included an evaluation of Prevention of Significant Deterioration (PSD) increments in the vicinity of Ely and an evaluation of National and Nevada Ambient Air Quality Standards (AAQS).

Section 2.0 of this report discusses the Class II area air impact analysis, Section 3.0 discusses the Class I area air impact analysis, which is also known as the long-range air impact analysis. Section 4.0 presents an additional AQIA that addresses air quality-related values (AQRV).

Legend

Fence Line Boundary

N
W E
S

0 5

Approximate Scale in Miles

Sierra Pacific
RESOURCES

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Figure 1-1
Ely Energy Center
Location Map

2006-09-30 S:\Project\sppco\steptoe\GIS\Location_Map1-1.mxd Bob Farnes

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Section 5.0 lists references used to prepare this AQIA. In addition, Attachments A, B and C of this AQIA provide the load screening analysis results, Texas Commission on Environmental Quality (TCEQ) Air Quality Modeling Guidelines Section 6.6, and the electronic modeling files, respectively.

2.0 CLASS II AREA AIR IMPACT ANALYSIS

Dispersion modeling of criteria pollutants was performed to estimate the ambient air quality impacts from the proposed EEC. Modeling was conducted to estimate the PSD increment consumption and total pollutant concentrations resulting from industrial and other pollutant emission sources in the vicinity of the EEC. The modeling evaluated incremental impacts of the following for comparison with Class II PSD increments: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}). Total impacts of NO_2, SO_2, and PM_{10} were compared to the AAQS. Modeled concentrations of nitrogen oxides (NO_x) were converted to NO_2 by multiplying them by the U.S. Environmental Protection Agency's (EPA) empirically derived scaling factor of 0.75. Incremental impacts of carbon monoxide (CO) were compared to significant impact levels (SIL). Maximum potential emissions of volatile organic compounds (VOC), which are precursors to ozone (O_3), were modeled to provide a worst-case estimate of O_3 impacts. Maximum potential impacts of lead were estimated for comparison to the AAQS. The modeled concentrations were estimated for each criteria pollutant and applicable averaging period.

SIL modeling was completed by calculating potential impacts from the proposed EEC emission sources and comparing the results with the PSD SILs. For AAQS modeling, proposed EEC as well as nearby emission sources were considered. Information about nearby source PM_{10}, NO_2, and SO_2 impacts within the significant impact area was provided by NDEP and the Utah Department of Environmental Quality (UDEQ). The highest cumulative modeled concentrations for NO_2, SO_2, and PM_{10} were added to the appropriate background concentrations and compared to the applicable AAQS. Background concentrations were obtained from on-site monitoring data collected from September 2006 through August 2007. The background values represent one full year of data collection at the EEC project site. This method of evaluating cumulative impacts from the EEC and neighboring sources can overestimate concentrations because impacts from other modeled sources and background monitoring can double-count concentration impacts; however, this method ensures that ambient standards will not be exceeded. Modeled VOC concentrations were directly compared to the O_3 AAQS without taking into account chemical transformation in the atmosphere. Modeled CO concentrations were compared to the applicable modeling significance levels. Modeled lead concentrations were compared to the AAQS for lead. All receptors in the data set were evaluated for compliance with AAQS.

The PSD minor source baseline date for Hydrographic Basin 179, the air basin in which the EEC is located, is June 4, 1979, for PM_{10} and November 28, 1984, for SO_2. Modeling completed to evaluate PSD increment consumption was accomplished by adding nearby source impacts to the EEC impacts. Because a baseline inventory has not yet been completed for the region in which

EEC is located, all emission sources were conservatively assumed to be PSD increment-consuming and were included in the PSD increment consumption analysis. Model results represent cumulative impacts from all emission sources in the basin. PSD increment consumption was evaluated by comparing the modeled pollutant concentrations with the pollutant PSD increment values.

Table 2-1 summarizes the modeling significance levels, National AAQS, Nevada AAQS, and PSD increments that the EEC must meet to demonstrate compliance with AAQS.

TABLE 2-1
MODELING SIGNIFICANCE LEVELS AND AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	Modeling Significance Level[(a)] ($\mu g/m^3$)	National AAQS ($\mu g/m^3$)	Nevada AAQS ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)
NO_2	Annual	1	100	100	25
SO_2	Annual	1	80	80	20
	24 hours	5	365[(b)]	365	91[(b)]
	3 hours	25	1,300 [(b)]	1,300	512[(b)]
CO	8 hours	500	10,000 [(b)]	10,000[(c)]	NA
	1 hour	2,000	40,000 [(b)]	40,000	NA
PM_{10}	Annual	1	Revoked [(d)]	50	17
	24 hours	5	150 [(b)]	150	30[(b)]
Lead	Quarterly	NA	1.5	1.5	NA
O_3	1 hour	NA	235 [(b)]	235	NA

Notes:

$\mu g/m^3$ Microgram per cubic meter
NA Not applicable

a Source: EPA 1990
b Not to be exceeded more than once per calendar year
c 6,670 $\mu g/m^3$ at areas equal to or greater than 5,000 feet above mean sea level
d EPA revoked this standard effective December 17, 2006

The modeling analysis was conducted in accordance with the guidance and protocols outlined in the Nevada air pollution rules (NAC Chapter 445B) and EPA's "Guideline on Air Quality Models (Revised)" (EPA 2005). The following sections discuss model selection and setup, building downwash calculation, background concentrations, meteorological data, source input data, and model receptors, followed by a summary of modeling results.

2.1 MODEL SELECTION AND SETUP

The dispersion modeling was conducted using the American Meteorological Society/ EPA Regulatory Model Improvement Committee Dispersion Model named "AERMOD." Use of AERMOD is consistent with the NDEP PSD increment tracking system. EPA recently recognized AERMOD as an approved model for use in regulatory applications (EPA 2005). The approved version of AERMOD (Version 07026) includes PRIME downwash algorithms and corrects several other minor problems associated with the previous version of AERMOD.

AERMOD is a Gaussian plume dispersion model based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions based on the probability density function and the superposition of several Gaussian plumes. The AERMOD modeling system has three components: (1) AERMAP, the terrain preprocessor program; (2) AERMET, the meteorological data preprocessor; and (3) AERMOD, which includes the dispersion modeling algorithms.

AERMOD was developed to handle simple and complex terrain issues using improved algorithms. As with the Complex Terrain Dispersion Model, AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain.

AERMOD was used to predict maximum pollutant concentrations in ambient air from EEC emissions for comparison with modeled SILs, the AAQS, and PSD increments. AERMOD was run using all regulatory default options, including use of stack-tip downwash, buoyancy-induced dispersion, calms processing routines, upper-bound downwash concentrations for super-squat buildings, default wind speed profile exponents, vertical potential temperature gradients, and no use of gradual plume rise. The local terrain was incorporated into the calculations.

2.2 BUILDING DOWNWASH CALCULATION

The modeling analysis included evaluation of building dimensions at the EEC to assess potential downwash effects on stack emissions from nearby structures. Direction-specific downwash parameters were calculated using facility plot-plan maps and EPA's Building Profile Input Program PRIME (BPIPPRM) software. This software has produced building dimension data that have been used with the PRIME building downwash algorithms incorporated into AERMOD.

2.3 BACKGROUND CONCENTRATIONS

Ambient background concentrations represent the contribution of pollutant sources not included in the modeling analysis, including naturally occurring sources. The ambient background concentrations used for this modeling were obtained from the first and second quarter of ambient data collected during on-site monitoring. These values are subject to change as monitoring continues, but all values are relatively low and significant changes are not expected. After one full year of data has been collected, the modeling results will be re-evaluated based on the updated background concentrations. Background concentrations of SO_2, NO_2, CO, O_3, and PM_{10} were obtained from on-site monitoring data collected from September 2006 through August 2007. These data were used in the modeling analysis. Table 2-2 summarizes these background concentrations.

TABLE 2-2

SEPTEMBER 2006 THROUGH AUGUST 2007 BACKGROUND DATA

Pollutant	Averaging Period	Annual Ambient Background Concentration ($\mu g/m^3$)
SO_2	3 hours	4.0
	24 hours	3.0
	Period	3.0
PM_{10}	24 hours	19.0
	Period	7.0
NO_2	Period	3.7
CO	1 hour	2415
	8 hours	2358
O_3	1 hour	167

2.4 METEOROLOGICAL DATA

Dispersion modeling was conducted using one full year of data collected from the on-site meteorological monitoring station. This operating permit application to construct is submitted with modeling based on the first valid year of on-site data.

Based on discussions with NDEP, Sierra Pacific Power Company and Nevada Power Company have installed on-site meteorological monitoring equipment at two sites adjacent to the proposed EEC locations. At each site, a 50-meter-high meteorological tower was installed with meteorological measurements collected at 2, 10, and 50 meters. In addition, a SODAR monitoring system was installed and is collecting wind data at heights from 50 meters up to approximately 500 meters above ground level. Ambient air quality monitors were also installed, collecting NO_x, SO_2, PM_{10}, CO, lead and O_3 data. The on-site system has collected measurements for a full year. The on-site measurements summarized below have been processed into a model-ready format using AERMET software for the full year of data collection:

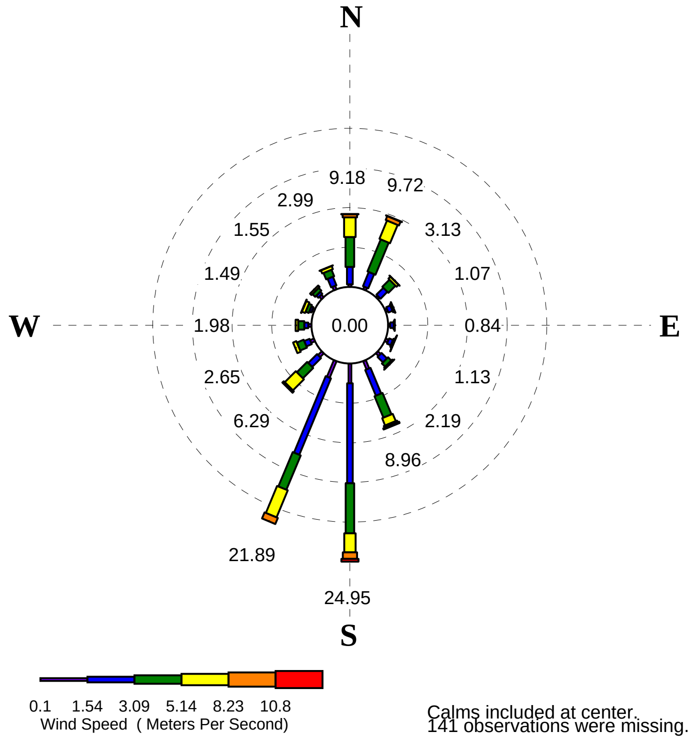
Parameter	**Data Collection Level(s)**
Net radiation	2 meters
Temperature	2, 10, and 50 meters
Wind direction	10 to 500 meters
Wind speed	10 to 500 meters
Standard deviation of azimuth angle of wind direction	10, 50 meters
Standard deviation of vertical component of wind speed	10 to 500 meters

Data collected at the 2, 10, and 50 meter levels are from tower data. Data collected from 75 meters to 500 meter levels are from SODAR. Final modeling with a full year of onsite data has incorporated wind measurements to 500 meters. Wind rose plots of the wind data collected on-site at the 10 and 200 meter levels from September 1, 2006 through February 28, 2007 are presented in Figure 2-1.

Figure 2-1

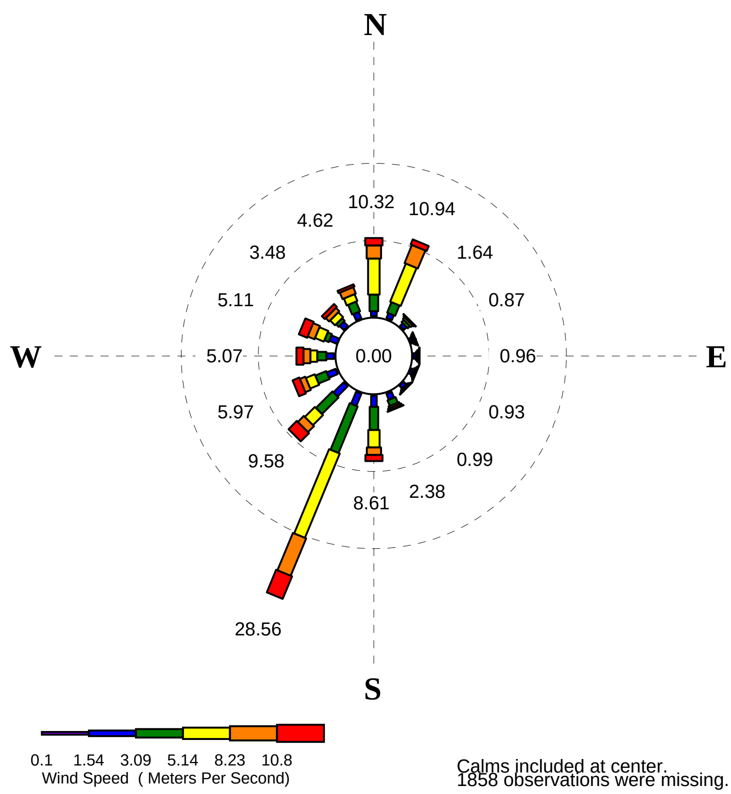
EEC On-Site Meteorological Data, 10-Meter Windrose

September 2006 - February 2007



200-Meter Windrose

September 2006 - August 2007



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A summary of windroses from the on-site meteorological station shows that the predominant winds at the on-site station 10 meter level blow from the south 25.0% of the time, the south-southwest 21.9% of the time and from the north-northeast and north 18.9% of the time, while winds at the 200 meter level blow from the south 8.6% of the time, the south-southwest 28.6% of the time and from the north-northeast and north 21.3% of the time. Magnitudes of windspeeds at the 200 meter level are generally higher than those at the 10 meter level.

On-site meteorological data were processed with upper air and surface data from the Elko, NV and Ely, NV NWS stations, respectively. This is the most representative data available for the 2006 and 2007 monitoring period, as upper air data is no longer being collected at the Ely, NV NWS station.

Surface parameters required as input to AERMET, but not included in the on-site dataset include albedo of ground cover, Bowen Ratio and surface roughness length. These parameters have been estimated using guidance in the User's Guide for the AERMOD Meteorological Preprocessor – AERMET (EPA 2004). The following variables were used for AERMET processing of both NWS and on-site data. These parameters represent desert shrubland and dry conditions.

Season	Albedo of Ground Cover	Bowen Ratio	Surface Roughness Length (m)
Winter	0.450	10.0	0.15
Spring	0.300	5.0	0.30
Summer	0.280	6.0	0.30
Fall	0.280	10.0	0.30

2.5 SOURCE INPUT DATA

The EEC will emit significant amounts of criteria pollutants. Pollutant emissions for the combustion sources as well as material handling and fugitive emissions were quantified and incorporated into the modeling analysis. The modeled emission rates represent the maximum requested emission limits. A demonstration of compliance with these maximum emission rates would show compliance for all emission rate scenarios. Because of extensive model runtimes, all sources were modeled using short-term emission rates for PM_{10}, SO_2, VOCs and CO. For each of these pollutants, both short-term and annual concentrations were estimated in the same model run. Because NO_2 does not have short-term ambient standards, annual average NO_X emissions were used for modeling purposes. For sources that operate only a portion of the year, annual NO_X emissions are calculated based on the proposed hours of operation for each source, and have been modeled over the entire modeling period.

Figure 2-2 shows the layout of the EEC, including emissions sources. Tables 2-3 and 2-4 summarize model parameters for the proposed EEC sources. Lead emissions are not represented on the tables because emission rates for lead are associated with the main stack only at a rate of 0.06 gram per second (g/s). This revision of the AIQA includes some changes to emission parameters, shown in Tables 2-3 and 2-4. Detailed emission calculations are provided in Appendix 6.

Preliminary modeling runs using the EPA SCREEN3 model were conducted to determine worst-case emission conditions for the PC Boilers 1 and 2 stack. Stack conditions and estimated emission rates at 100, 75 and 50 percent load were input to the model. Results of the modeling indicate that maximum impacts would be associated with 100 percent load conditions; therefore, the full analysis is based on 100 percent load conditions. Attachment A presents the results of the SCREEN3 load screening analysis.

Material handling emissions were quantified for worst-case modeling conditions and include wind erosion emissions from dormant and non-dormant piles.

The AERMOD User Guide (EPA 2004a) indicates that a line source can be represented in AERMOD using either a string of volume sources, or as an elongated area source. Volume source algorithms are most applicable to line sources with some initial plume depth, and area source algorithms are most applicable to near ground level line sources. Based on information provided in a 2003 Trinity paper "Analysis of Haul Road Emission Test Data for Determining Dispersion Modeling Parameters", haul roads are justifiably represented by a line source with some initial plume depth.

Fugitive emissions from haul roads were modeled using the protocols developed by the Texas Commission on Environmental Quality (TCEQ). The TCEQ is one of the few state agencies that has provided written guidance on how to represent emissions from roadways in Gaussian models, and for determining the appropriate modeling parameters for haul road sources. The following is a summary of the procedure recommended by TCEQ. A copy of the TCEQ Air Quality Modeling Guidelines is included in Attachment B for reference.

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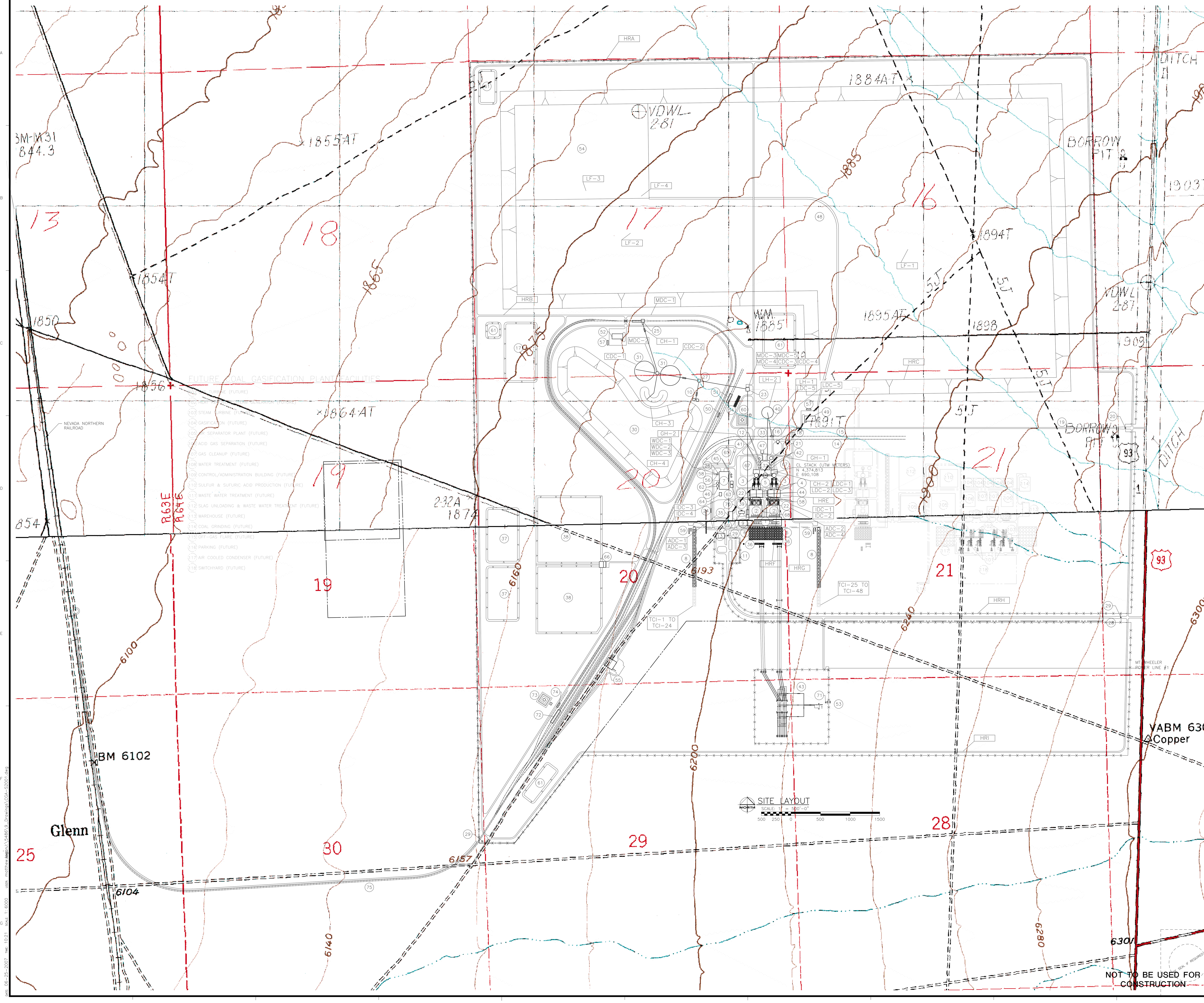

FACILITIES LEGEND

1. STEAM TURBINE GENERATOR (120')
2. BOILER (280')
3. AQCS WET FGD (120')
4. AQCS FABRIC FILTER (65')
5. STACK (727')
6. CONDENSATE STORAGE TANK (UNDER ACC) (34')
7. WATER/WASTE WATER TREATMENT (32')
8. COOLING TOWER (50')
9. ADMINISTRATION BUILDING (75')
10. EMERGENCY COAL RECLAIM
11. EMPLOYEE PARKING
12. MAKE-UP WATER TANKS (30')
13. WAREHOUSE BUILDING (24')
14. ASH/GYPSUM LOADOUT TRACK
15. LIMESTONE UNLOADING TRACK
16. LIMESTONE UNLOADING (32')
17. COAL PILE RUN-OFF POND
18. FLY ASH SILOS (125')
19. CONSTRUCTION ENTRANCE ROAD
20. CONSTRUCTION GUARD HOUSE (10')
21. ABSORBER HOLD TANK (50')
22. BOTTOM ASH SILO (100')
23. CRUSHER HOUSE (90')
24. TRUCK SCALE
25. ROTARY DUMPER (32')
26. SODA ASH
27. CONVEYOR TRANSFER TOWER #2 (40')
28. PLANT ACCESS ROAD
29. GUARD HOUSE (10')
30. COAL PILE DEAD STORAGE (40')
31. COAL LIVE STORAGE DOME (120')
32. LIMESTONE PREP/GYPSUM DEWATERING BLDG (85')
33. LIMESTONE CONVEYOR
34. AMMONIA STORAGE
35. PLANT MAINTENANCE BUILDING (40')
36. AIR COOLED CONDENSER (120')
37. EVAPORATION POND
38. SERVICE/FIRE WATER STORAGE POND
39. AUXILIARY BOILER
40. LIMESTONE STORAGE (55')
41. RECLAIM WATER TANK (15')
42. LIMESTONE SLURRY TANK (30')
43. SWITCHYARD
44. PAC SILO (70')
45. DEMINERALIZED WATER STORAGE TANK (40')
46. POTABLE WATER STORAGE TANK (15')
47. GYPSUM BUNKER (25')
48. LANDFILL
49. ASH HAUL TRUCK/LIGHT VEHICLE MAINT FACILITY (32')
50. SECONDARY/AUX BOILER DIESEL FUEL LOAD/UNLOAD STA
51. AMMONIA UNLOADING
52. COAL YARD TRUCK MAINTENANCE (32')
53. COMMUNICATION SHELTERS & MICROWAVE TOWER
54. 5-YEAR LANDFILL CELL
55. RAIL CAR OPERATION & MAINTENANCE FACILITY (32')
56. MAGNESIUM HYDROXIDE STORAGE SILO (100')
57. MOBILE EQUIPMENT FUELING
58. HYDRATED LIME STORAGE SILO (70')
59. CIRC WATER CHEM FEED EQUIPMENT
60. SECONDARY/AUX BOILER DIESEL FUEL STORAGE (46')
61. SITE STORM DETENTION POND
62. CLARIFIERS (30')
63. PLANT WASTEWATER SUMP & MAINTENANCE BASIN
64. SANITARY WATER TREATMENT PLANT
65. LIMESTONE/GYPSUM/ASH BASIN
66. SERVICE/FIRE WATER PUMP HOUSE (24')
67. FUTURE CO2 CAPTURE
68. BURNER D2 SUPPLY TANK (15')
69. FIRE BOOSTER PUMPS/STA AIR COMP/STANDBY GEN (24')
70. AUX BOILER/STANDBY GEN D2 SUPPLY TANK (15')
71. SWITCHYARD/COMMUNICATIONS AUXILIARY GENERATOR (10')
72. LOCOMOTIVE FUELING RACK
73. LOCOMOTIVE DIESEL FUEL STORAGE (30')
74. LOCOMOTIVE DIESEL FUEL LOAD/UNLOAD STA
75. INTERCONNECTING RAIL LOOP

F	12 APR 07	REVISED	TMS	JAC		
E	15 FEB 07	REVISED	TMS	JAC		
D	2 FEB 07	BOILER SPEC – FOR BIDS	TMS	JAC		
C	25 JAN 07	OWNER REVIEW	TMS			
H	26 JUNE 07	INCORPORATED COMMENTS	ELT			
G	25 MAY 07	REVISED	TMS			
REV.	DATE	DESCRIPTION	DWN	ENGR	CHK	APPV

CUMMINS & BARNARD, INC.
CONSULTING ENGINEERS SINCE 1932
5405 DATA COURT
ANN ARBOR, MICHIGAN 48108
(734) 761-9130 Fax (734) 761-9881
www.Cummins-Barnard.com

Ely Energy Center
SIERRA PACIFIC RESOURCES

ELY ENERGY CENTER
PRELIMINARY SITE ARRANGEMENT
SOUTH STEPTOE VALLEY SITE

SCALE: 1=500' | PROJECT NO. 5486

DWG. NO. 5486-CGA-S2001 | REV. H

TABLE 2-3
MODELED POINT SOURCE EMISSION RATES AND STACK PARAMETERS

POINT SOURCES														
Source Name	Source Description	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Elevation (m)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)	Modeled Emission Rates (g/s)[1]					
									CO	NO_X	Pb	PM_{10}	SO_2	VOC
MSTK1	Unit #1 Boiler	690102	4374813	1889	221.6	324.3	16.80	11.00	109.75	65.85	2.8E-02	21.95	3-hr 87.80 24 -hr 65.85	3.84
MSTK2	Unit #2 Boiler	690114	4374813	1889	221.6	324.3	16.80	11.00	109.75	65.85	2.8E-02	21.95	3-hr 87.80 24 -hr 65.85	3.84
AUXBLR	Auxiliary Boiler	690010	4374629	1888	91.4	449.8	18.00	1.52	9.98E-01	2.77E+00	N/A	5.54E-01	1.39E+00	4.99E-02
DIESGEN	3 MW Diesel Generator	690390	4373576	1895	6.09	710.9	22.01	0.69	2.92E+00	1.33E-01	N/A	1.67E-01	2.39E-03	6.67E-01
RAILF	Locomotive Idle - Front	689137	4375594	1875	6.09	700.0	25.30	0.46	7.33E-01	2.47E+00	N/A	1.50E-01	2.84E-02	1.83E-01
RAILB	Locomotive Idle - Back	688987	4373543	1883	6.09	700.0	25.30	0.46	7.33E-01	2.47E+00	N/A	1.50E-01	2.84E-02	1.83E-01
FRPMP	Fire Pump	689284	4374181	1883	3.05	836.5	26.59	0.30	5.69E-01	2.62E-02	N/A	3.28E-02	4.04E-04	1.31E-01
FRPMP2	90 hp Diesel Fire Water Booster Pump	690010	4374597	1889	3.05	308.2	5.27	0.20	9.25E-02	2.23E-03	N/A	7.50E-03	4.62E-05	1.09E-02
DIESGEN500	750 kW Diesel Generator	690006	4374628	1889	6.09	805.4	22.74	0.36	7.29E-01	3.33E-02	N/A	4.17E-02	5.20E-04	1.67E-01
DIESPMP	Emergency Quench Water System Diesel Pump	689284	4374168	1883	3.05	810.9	20.05	0.30	4.93E-01	1.42E-02	N/A	2.84E-02	3.50E-04	7.11E-02
SPKGEN	Propane Spark Ignited Communication Auxiliary Generator	690373	4373576	1895	1.36	901.2	29.71	0.10	4.03E-03	1.09E-02	N/A	7.56E-04	1.89E-03	6.30E-04
MDC-1	Car Dumper Dust Collector	689455	4375621	1880	1.83	Ambient	18.39	2.29	N/A	N/A	N/A	8.64E-01	N/A	N/A
MDC-2	Transfer Tower #1 Dust Collector	689549	4375331	1883	61.00	Ambient	15.75	0.87	N/A	N/A	N/A	1.13E-01	N/A	N/A
MDC-3	Transfer Tower #2 Dust Collector	689759	4375242	1885	61.00	Ambient	15.75	0.87	N/A	N/A	N/A	1.13E-01	N/A	N/A
MDC-4	Crusher Building Dust Collector	690018	4375264	1887	36.58	Ambient	17.24	0.91	N/A	N/A	N/A	1.24E-01	N/A	N/A
MDC-5	Transfer Tower #3 Dust Collector	690020	4374602	1889	61.00	Ambient	15.75	0.87	N/A	N/A	N/A	1.13E-01	N/A	N/A
CDC-1	Coal Storage Dome #1 Dust Collector (live storage)	689443	4375371	1883	1.83	Ambient	18.46	2.21	N/A	N/A	N/A	8.10E-01	N/A	N/A
CDC-2	Coal Storage Dome #2 Dust Collector (live storage)	689666	4375314	1883	1.83	Ambient	18.46	2.21	N/A	N/A	N/A	8.10E-01	N/A	N/A
CDC-3	Coal Reclaim Conveyor and Tunnel #1 Dust Collector	689533	4375340	1883	1.83	Ambient	18.96	0.63	N/A	N/A	N/A	5.94E-02	N/A	N/A
CDC-4	Coal Reclaim Conveyor and Tunnel #2 Dust Collector	689570	4375339	1883	1.83	Ambient	18.96	0.63	N/A	N/A	N/A	5.94E-02	N/A	N/A
CDC-5	Coal Tripper Floor Unit #1 Dust Collector A	690018	4375264	1887	36.58	Ambient	17.24	0.91	N/A	N/A	N/A	1.24E-01	N/A	N/A
CDC-6	Coal Tripper Floor Unit #1 Dust Collector B	690018	4375264	1887	36.58	Ambient	17.24	0.91	N/A	N/A	N/A	1.24E-01	N/A	N/A
CDC-7	Coal Tripper Floor Unit #2 Dust Collector A	690018	4375264	1887	36.58	Ambient	17.24	0.91	N/A	N/A	N/A	1.24E-01	N/A	N/A
CDC-8	Coal Tripper Floor Unit #2 Dust Collector B	690018	4375264	1887	36.58	Ambient	17.24	0.91	N/A	N/A	N/A	1.24E-01	N/A	N/A
LDC-1	Limestone Preparation Building Dust Collector	690108	4374864	1890	24.38	Ambient	16.56	0.38	N/A	N/A	N/A	2.16E-02	N/A	N/A

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TABLE 2-3
MODELED POINT SOURCE EMISSION RATES AND STACK PARAMETERS

POINT SOURCES														
Source Name	Source Description	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Elevation (m)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)	Modeled Emission Rates (g/s)[1]					
									CO	NO_X	Pb	PM_{10}	SO_2	VOC
LDC-2	Limestone Silo A Dust Collector	690108	4374864	1890	24.38	Ambient	17.73	0.16	N/A	N/A	N/A	7.56E-03	N/A	N/A
LDC-3	Limestone Silo B Dust Collector	690108	4374864	1890	24.38	Ambient	17.73	0.16	N/A	N/A	N/A	7.56E-03	N/A	N/A
LDC-4	Limestone Reclaim Tunnel Dust Collector	690108	4374890	1890	1.83	Ambient	21.89	0.38	N/A	N/A	N/A	2.23E-02	N/A	N/A
LDC-5	Limestone Unloading Building dust collector	690143	4375027	1890	1.83	Ambient	19.40	1.52	N/A	N/A	N/A	4.05E-01	N/A	N/A
ACD-1	Fly Ash Silo 1 Dust	690177	4374998	1890	30.48	324.8	14.63	0.19	N/A	N/A	N/A	1.08E-02	N/A	N/A
ACD-2	Fly Ash Silo 2 Dust	690201	4374998	1890	30.48	324.8	14.63	0.19	N/A	N/A	N/A	1.08E-02	N/A	N/A
ACD-3	Bottom Ash Silo 1 Dust Collector	690026	4374693	1890	30.48	324.8	14.63	0.19	N/A	N/A	N/A	1.08E-02	N/A	N/A
ACD-4	Bottom Ash Silo 2 Dust Collector	690118	4374693	1890	30.48	324.8	14.63	0.19	N/A	N/A	N/A	1.08E-02	N/A	N/A
IDC-1	DSI Storage Silo Unit 1 Dust Collector	690023	4374729	1890	22.80	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
IDC-2	PAC Storage Silo Unit 1 Dust Collector	690023	4374718	1890	21.30	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
IDC-3	DSI Storage Silo Unit 2 Dust Collector	690194	4374729	1890	22.80	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
IDC-4	PAC Storage Silo Unit 2 Dust Collector	690194	4374718	1890	21.30	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
WDC-1	Soda Ash Storage Silo Dust Collector	689892	4374733	1888	15.20	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
WDC-2	Lime Storage Silo Dust Collector	689907	4374733	1888	52.00	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
WDC-3	Magnesium Hydroxide (MgOH) Dust Collector	689922	4374733	1888	52.00	Ambient	15.20	0.15	N/A	N/A	N/A	6.48E-03	N/A	N/A
FE-1	Secondary fuel/startup and emergency power - 2,000,000 gallon diesel tank	689995	4375099	1888	9.75	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	3.33E-03
FE-2	Rail Power Refueling - 1,000,000 gallon diesel tank	689030	4373602	1883	9.75	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	2.01E-03
FE-3	Burner Supply - 60,000 gallon diesel tank	690192	4374645	1890	18.29	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	5.01E-04
FE-4	Burner Supply - 60,000 gallon diesel tank	690192	4374618	1890	18.29	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	5.01E-04
FE-5	Auxiliary Boiler/Emergency Generator - 15,000 gallon diesel tank	689980	4374648	1890	3.66	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	2.28E-04
FE-6	Main Fire Water Pump - 700 gallon diesel tank	689268	4374182	1883	2.13	Ambient	0.08	0.06	N/A	N/A	N/A	N/A	N/A	1.73E-06
FE-7	Booster Fire Water Pump - 200 gallon diesel tank	689980	4374616	1890	1.83	Ambient	0.08	0.06	N/A	N/A	N/A	N/A	N/A	1.15E-06

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TABLE 2-3
MODELED POINT SOURCE EMISSION RATES AND STACK PARAMETERS

POINT SOURCES														
Source Name	**Source Description**	**NAD 83 UTM Location (mE)**	**NAD 83 UTM Location (mN)**	**Elevation (m)**	**Stack Height (meters)**	**Stack Temperature (K)**	**Exit Velocity (m/s)**	**Stack Diameter (meters)**	**Modeled Emission Rates (g/s)[1]**					
									CO	**NO_X**	**Pb**	**PM_{10}**	**SO_2**	**VOC**
FE-8	Emergency Quench Water Pump - 700 gallon diesel tank	689268	4374168	1883	2.13	Ambient	0.08	0.06	N/A	N/A	N/A	N/A	N/A	1.73E-06
FE-9	Switchyard Backup Power Supply - 700 gallon diesel tank	690386	4373625	1895	2.13	Ambient	0.08	0.06	N/A	N/A	N/A	N/A	N/A	1.73E-06
FE-10	Coal Yard Equipment Fueling - 25,000 gallon	689304	4375498	1880	3.35	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	1.95E-04
FE-11	Ash Haul Truck/Light Vehicle Fueling - 15,000 gallon diesel tank	690202	4375158	1890	3.35	Ambient	0.08	0.16	N/A	N/A	N/A	N/A	N/A	2.75E-05
FE-12	Ash Haul Truck/Light Vehicle Refueling - 15,000 gallon gasoline tank	690212	4375158	1890	3.66	Ambient	0.08	0.13	N/A	N/A	N/A	N/A	N/A	5.27E-02
TC1-1	Tower1Cell01	689742	4374247	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-2	Tower1Cell02	689742	4374259	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-3	Tower1Cell03	689742	4374272	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-4	Tower1Cell04	689742	4374284	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-5	Tower1Cell05	689742	4374296	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-6	Tower1Cell06	689742	4374308	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-7	Tower1Cell07	689742	4374320	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-8	Tower1Cell08	689742	4374332	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-9	Tower1Cell09	689742	4374344	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-10	Tower1Cell10	689742	4374357	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-11	Tower1Cell11	689742	4374369	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-12	Tower1Cell12	689742	4374381	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-13	Tower1Cell13	689742	4374393	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-14	Tower1Cell14	689742	4374405	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-15	Tower1Cell15	689742	4374417	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-16	Tower1Cell16	689742	4374430	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-17	Tower1Cell17	689742	4374442	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-18	Tower1Cell18	689742	4374454	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-19	Tower1Cell19	689742	4374466	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-20	Tower1Cell20	689742	4374478	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-21	Tower1Cell21	689742	4374490	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-22	Tower1Cell22	689742	4374503	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-23	Tower1Cell23	689742	4374515	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC1-24	Tower1Cell24	689742	4374527	1887	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-1	Tower2Cell01	690383	4374244	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-2	Tower2Cell02	690383	4374256	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-3	Tower2Cell03	690383	4374268	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-4	Tower2Cell04	690383	4374280	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-5	Tower2Cell05	690383	4374292	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-6	Tower2Cell06	690383	4374304	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-7	Tower2Cell07	690383	4374317	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-8	Tower2Cell08	690383	4374329	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A

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TABLE 2-3
MODELED POINT SOURCE EMISSION RATES AND STACK PARAMETERS

POINT SOURCES															
Source Name	Source Description	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Elevation (m)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)	Modeled Emission Rates (g/s)[1]					
									CO	NO_X	Pb	PM_{10}	SO_2	VOC
TC2-9	Tower2Cell09	690383	4374341	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-10	Tower2Cell10	690383	4374353	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-11	Tower2Cell11	690383	4374365	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-12	Tower2Cell12	690383	4374377	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-13	Tower2Cell13	690383	4374390	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-14	Tower2Cell14	690383	4374402	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-15	Tower2Cell15	690383	4374414	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-16	Tower2Cell16	690383	4374426	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-17	Tower2Cell17	690383	4374438	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-18	Tower2Cell18	690383	4374450	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-19	Tower2Cell19	690383	4374463	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-20	Tower2Cell20	690383	4374475	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-21	Tower2Cell21	690383	4374487	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-22	Tower2Cell22	690383	4374499	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-23	Tower2Cell23	690383	4374511	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A
TC2-24	Tower2Cell24	690383	4374523	1895	14.33	284.6	7.15	10.00	N/A	N/A	N/A	3.28E-02	N/A	N/A

Notes:

[1] Short term emissions except for NO_X.

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TABLE 2-4
MODELED VOLUME SOURCE EMISSION RATES AND RELEASE PARAMETERS

VOLUME SOURCES													
Source Name	**Source Description**	**NAD 83 UTM Location (mE)**	**NAD 83 UTM Location (mN)**	**Elevation (m)**	**Release Height (meters)**	**Sigma-Y**	**Sigma-Z**	**Modeled Emission Rates (g/s)[1]**					
								CO	**NOX**	**Pb**	**PM_{10}**	**SO2**	**VOC**
CH-1	Coal Unloading Belt Feeder Transfer Point	689463	4375553	1880	9.14	3.5	4.3	N/A	N/A	N/A	0.00E+00	N/A	N/A
CH-2	Coal Stockout Conveyor	689887	4375285	1885	9.14	3.5	4.3	N/A	N/A	N/A	8.85E-03	N/A	N/A
CH-3	Active Coal Pile Wind Erosion and Maintenance	689523	4375168	1883	9.14	26.3	4.3	N/A	N/A	N/A	2.45E-01	N/A	N/A
CH-4	Inactive Portion of Coal Pile Wind Erosion - Phase I	689500	4375058	1883	9.14	100.2	4.3	N/A	N/A	N/A	3.27E-03	N/A	N/A
LH-1	Limestone Unloading Conveyor Transfer Point	690136	4375075	1889	21.34	3.5	9.9	N/A	N/A	N/A	1.54E-02	N/A	N/A
LH-2	Limestone Silo A Loading Conveyor Transfer Point	690108	4374864	1890	21.34	3.5	9.9	N/A	N/A	N/A	4.87E-03	N/A	N/A
LH-3	Limestone Silo B Loading Conveyor Transfer Point	690108	4374864	1890	21.34	3.5	9.9	N/A	N/A	N/A	4.87E-03	N/A	N/A
LH-4	Limestone Pile Wind Erosion and Maintenance	690120	4375135	1889	21.34	12.8	9.9	N/A	N/A	N/A	1.75E-01	N/A	N/A
GH-1	Gypsum Stockout Conveyor	690066	4374942	1890	7.62	3.5	3.5	N/A	N/A	N/A	1.42E-02	N/A	N/A
GH-2	Gypsum Pile Wind Erosion and Maintenance	690044	4374963	1890	7.62	11.6	3.5	N/A	N/A	N/A	2.61E-02	N/A	N/A
LF-1	Landfill Inactive Pile Wind Erosion - area 1	690889	4376051	1890	24.38	325.6	11.3	N/A	N/A	N/A	0.00E+00	N/A	N/A
LF-2	Landfill Inactive Pile Wind Erosion - area 2	689505	4376127	1880	24.38	318.6	11.3	N/A	N/A	N/A	0.00E+00	N/A	N/A
LF-3	Landfill Inactive Pile Wind Erosion - 5 yr cell	689153	4376496	1870	24.38	160.5	11.3	N/A	N/A	N/A	0.00E+00	N/A	N/A
LF-4	Landfill Stockout	689153	4376496	1870	24.38	3.5	11.3	N/A	N/A	N/A	4.34E-04	N/A	N/A
LF-5	Landfill Active Pile Wind Erosion and Maintenance	689153	4376496	1870	24.38	46.5	11.3	N/A	N/A	N/A	3.07E-01	N/A	N/A
Limestone Supply	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	2.83E-02	N/A	N/A
Lime Supply	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	5.49E-03	N/A	N/A
Sorbent Supply	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	1.65E-02	N/A	N/A

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TABLE 2-4
MODELED VOLUME SOURCE EMISSION RATES AND RELEASE PARAMETERS

VOLUME SOURCES													
Source Name	Source Description	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Elevation (m)	Release Height (meters)	Sigma-Y	Sigma-Z	Modeled Emission Rates (g/s)[1]					
								CO	NOX	Pb	PM_{10}	SO2	VOC
Soda Ash Supply	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	1.69E-02	N/A	N/A
Magnesium Hydroxide Supply	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	4.39E-03	N/A	N/A
Scrubber Sludge trucked to Landfill	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	8.13E-02	N/A	N/A
Fly Ash trucked to Landfill	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	1.60E-01	N/A	N/A
Bottom Ash trucked to Landfill	Total route emissions, see map for routes[2]				see A6-54	see A6-54	see A6-54	N/A	N/A	N/A	4.55E-02	N/A	N/A

Notes:

[1] Short term emissions

[2] Locations vary with each haul road segment

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TCEQ Road Source Emission Volume Source Characterization

1. Determine the adjusted width of the road. The adjusted width is the actual width of the road plus 6 meters. The additional width represents turbulence caused by the vehicle as it moves along the road.
2. Determine the number of volume sources, N. Divide the length of the road by the adjusted width. The result is the maximum number of volume sources that could be used to represent the road.
3. Determine the height of the volume. The height will be equal to twice the height of the vehicle generating the emissions.
4. Determine the initial horizontal sigma for each volume.
5. If the road is represented by a single volume, divide the adjusted width by 4.3.
6. If the road is represented by adjacent volumes, divide the adjusted width by 2.15.
7. If the road is represented by alternating volumes, divide by twice the adjusted width (measured from the center point of the first volume to the center point of the next represented volume) by 2.15. Start with the volume nearest to the property line. This representation is often used for long roads.
8. Determine the initial vertical sigma. Divide the height of the volume determined in Step 3 by 2.15.
9. Determine the release point. Divide the height of the volume by two. This point is the center of the volume.
10. Determine the emission rate for each volume used to calculate the initial horizontal sigma in Step 4. Divide the total emission rate equally among the individual volumes used to represent the road, unless there is a known spatial variation in emissions.
11. Determine the UTM coordinate for the release point. The release point location is in the center of the base of the volume. This location must be at least one meter from the nearest receptor.

Detailed emissions calculations for material handling sources are provided in Appendix 6 of the NDEP permit application package. Generally, emissions were calculated using engineering design specifications or standard emission calculation equations, such as those provided in EPA's AP-42.

The criteria pollutants modeled for this Class II analysis include: CO, NO_2, PM_{10}, SO_2, lead, and O_3. The sources modeled for the significant impact analysis include proposed EEC sources only.

Predicted EEC impacts from PM_{10} and SO_2 exceed the SILs. Current neighboring sources were added to the proposed EEC sources for the AAQS analyses modeling for these pollutants. Predicted EEC impacts from NO_2 are below the SILs; therefore, cumulative modeling was not required for this pollutant. Neighboring sources were, however, added to the proposed NO_x EEC sources to ensure that AAQS limits are not exceeded. Tables 2-5 through 2-7 summarize information on source parameters and emissions provided by NDEP and the UDEQ for nearby sources.

Cumulative PSD increment consumption analyses were also conducted for PM_{10}, NO_2, and SO_2. The cumulative PM_{10}, NO_2, and SO_2 PSD increment analysis requires baseline and current emissions source modeling to determine increment consumption near the proposed EEC. Emission inventory data provided by NDEP do not currently include baseline inventory data; therefore, all nearby sources were conservatively assumed to be increment-consuming.

2.6 MODEL RECEPTORS

The proposed EEC modeling was completed using a model receptor grid to ensure that maximum estimated impacts from the EEC are identified. In accordance with NDEP and EPA guidelines, receptor locations were identified with sufficient density and spatial coverage to isolate the area with the highest impacts. To accomplish this, the following receptor groups were used for the analysis:

- Fence line at 25-meter intervals
- 100-meter receptor spacing out to 2 kilometers (km) in all directions from the center of the EEC
- 500-meter receptor spacing between 4 and 8 km from the EEC
- 1,000-meter receptor spacing between 8 and 50 km from the EEC
- 30 receptors located on surrounding mountain peaks to ensure maximum impacts are identified at these elevated locations

The total number of receptors is 12,816. Figure 2-3 shows the receptor grid relative to the proposed EEC.

Because of the large receptor domain, it is not practical to assign terrain elevations to all receptors using U.S. Geological Survey (USGS) 7.5-minute series digital elevation model (DEM) data; therefore, receptor elevations were assigned using USGS 1-degree DEM data. After initial modeling to determine the areas of highest impact, model receptor elevations were re-assigned for these high-impact areas using the higher resolution 7.5-minute DEM data.

TABLE 2-5

NEARBY POINT SOURCE (WHITE PINE ENERGY) EMISSION RATES AND STACK PARAMETERS

Source Name	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	Modeled Emission Rate (g/s)			
							CO	NO_x	PM_{10}	SO_2
S01_S02	691242.7	4399588	182.88	347	19.81	9.57	197.2	92.0	49.95	116.4
S03	691362	4399588	182.88	347	19.81	6.77	98.6	46.0	24.97	58.2
S05	691238.4	4399461	68.58	627.6	18.11	2.21	1.85	0.264	2.31	0.072
S06	690904	4399120	1.52	293.2	0.01	1	NA	NA	0.065	NA
S08	690706.9	4399432	1.52	293.2	21.47	0.3	NA	NA	0.0359	NA
S10	690671	4399359	28.04	293.2	0.01	1	NA	NA	0.1196	NA
S13	690571.8	4399377	1.52	293.2	19.09	0.46	NA	NA	0.0717	NA
S15	690958.6	4399363	42.67	293.2	19.09	0.46	NA	NA	0.0717	NA
S17	691309.6	4399423	86.87	293.2	23.86	0.91	NA	NA	0.3586	NA
S20	691319.4	4399445	1.52	293.2	0.01	1	NA	NA	5.39E-04	NA
S22	691319.3	4399463	1.52	293.2	0.01	1	NA	NA	5.39E-04	NA
S23	691319.3	4399469	1.52	293.2	0.01	1	NA	NA	2.02E-03	NA
S25	692104.1	4401105	1.52	293.2	0.01	1	NA	NA	2.02E-03	NA
S26	691263.6	4399642	22.86	293.2	20.04	0.46	NA	NA	0.1506	NA
S27	691221	4399637	10.67	293.2	19.09	0.46	NA	NA	0.0717	NA
S28	691212.9	4399641	1.52	293.2	0.01	1	NA	NA	2.18E-03	NA
S30	692046.6	4401047	1.52	293.2	0.01	1	NA	NA	2.18E-03	NA
S33	691140	4399425	10.67	293.2	22.55	0.3	NA	NA	0.0753	NA
S35	690926.3	4399465	10.67	293.2	17.06	1.22	NA	NA	0.4558	NA
S37	691136.8	4399449	18.29	293.2	20.04	0.46	NA	NA	0.1506	NA
S44	691238.6	4399439	7.62	699.8	45.72	0.37	0.332	0.1798	0.0293	3.05E-03
S45	691091.6	4399539	10.67	699.8	45.72	0.18	0.3243	0.0167	0.0499	6.20E-04

Notes:

K Degree Kelvin
mE Meters east
mN Meters north
m/s Meter per second
NA Not applicable

TABLE 2-6

NEARBY AREA AND VOLUME SOURCE (WHITE PINE ENERGY) EMISSION RATES AND STACK PARAMETERS

Source Name	Source Type	NAD 83 UTM Location (mE)	NAD 83 UTM Location (mN)	Release Height (meters)	areacirc = radius areapoly = number of vertices volume = sigma y	Sigma Zinit	Modeled Emission Rate (g/s)
							PM_{10}
S07	AREACIRC	690671.1	4399436	9.91	26.36	4.61	4.28E-05
S11	AREACIRC	690718.2	4399359	14.02	37.18	6.52	4.30E-05
S12	AREACIRC	690623.8	4399359	14.02	37.18	6.52	4.30E-05
S18	AREAPOLY	690807.2	4399300	9.14	4	4.25	7.29E-07
S32_S38	AREAPOLY	690050.9	4401032	0	4	0	8.76E-08
S39.1 – S39.56[a]	VOLUME	691421.2	4398741	3.05	17.01	1.42	2.84E-04

Notes:
mE Meters east
mN Meters north
m/s Meter per second
NA Not applicable

a Locations vary with each segment

TABLE 2-7

NEARBY SOURCE EMISSION RATES AND STACK PARAMETERS

Facility Name	Source ID	Pollutant	Emission Rate (g/s)	UTM Location (mE)	UTM Location (mN)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)
H E Hunewill Construction Co., Inc.	0171am	PM_{10}	10.67	740760	4321140	10.00	295.37	0.00001	1.01
	0171am	SO_2	4.02	740760	4321140	10.00	295.37	0.00001	1.01
	0171048a	PM_{10}	0.37	740760	4321140	12.65	422.04	5.346	1.01
	0171048a	SO_2	2.12	740760	4321140	12.65	422.04	5.346	1.01
	0171048b	PM_{10}	0.37	740760	4321140	12.65	422.04	5.346	1.01
	0171048b	SO_2	2.12	740760	4321140	12.65	422.04	5.346	1.01
	171049	PM_{10}	2.14	740760	4321140	12.65	422.04	32.667	1.01
	171049	SO_2	2.65	740760	4321140	12.65	422.04	32.667	1.01
Robinson Nevada Mining Company	0373am	PM_{10}	12.12	671580	4347540	10.00	295.37	0.00001	1.01
	0373am	SO_2	0.51	671580	4347540	10.00	295.37	0.00001	1.01
	0373am	NO_x	0.736	671580	4347540	10.00	295.37	0.00001	1.01
	373008	PM_{10}	0.02	671580	4347540	9.14	295.37	0.00001	0.67
	373002	PM_{10}	0.33	671580	4347540	8.99	292.98	10.109	0.91
	373005	PM_{10}	0.33	671580	4347540	10.00	296.09	10.110	0.91
	373006	PM_{10}	0.07	671580	4347540	15.00	292.98	9.676	0.43
	373009	PM_{10}	0.10	671580	4347540	6.00	324.98	4.450	0.76
	373010	PM_{10}	0.13	671580	4347540	6.00	324.98	5.795	0.76
	373011	PM_{10}	0.003	671580	4347540	6.00	354.98	9.675	0.70
	373017	PM_{10}	0.05	671580	4347540	2.99	874.82	14.513	0.58
	373017	SO_2	0.18	671580	4347540	2.99	874.82	14.513	0.58
	373017	NO_x	0.078	671580	4347540	2.99	874.82	14.513	0.58
Newmont Gold Company	0405am	PM_{10}	1.00	583930	4495990	10.00	295.37	0.00001	1.01
J & M Trucking, Inc.	543001	PM_{10}	0.04	684020	4346150	10.00	342.76	2.052	1.52
	0543am	PM_{10}	0.07	684020	4346150	10.00	295.37	0.00001	1.01

TABLE 2-7 (continued)

NEARBY SOURCE EMISSION RATES AND STACK PARAMETERS

Facility Name	Source ID	Pollutant	Emission Rate (g/s)	UTM Location (mE)	UTM Location (mN)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)
Homestake Mining Company	713019	PM_{10}	0.002	589940	4376280	21.42	333.15	10.097	0.10
Reck Brothers	0835am	PM_{10}	0.45	689110	4348990	10.00	295.37	0.00001	1.01
	0835am	PM_{10}	0.12	689110	4348990	10.00	295.37	0.00001	1.01
	0835am	NO_x	0.296	689110	4348990	10.00	295.37	0.00001	1.01
Nevada Slag, Inc.	1065am	PM_{10}	0.87	691300	4364600	10.00	295.37	0.00001	1.01
	1065am	PM_{10}	0.93	691300	4364600	10.00	295.37	0.00001	1.01
	1065am	NO_x	0.308	691300	4364600	10.00	295.37	0.00001	1.01
Reed Distributing, Inc.	1124001	PM_{10}	0.0003	682780	4348580	6.10	505.37	0.809	0.61
	1124001	PM_{10}	0.0003	682780	4348580	6.10	505.37	0.809	0.61
J & M Trucking, Inc.	1177am	PM_{10}	0.07	589410	4373560	10.00	295.37	0.00001	1.01
Bald Mountain Mine Properties	1336am	PM_{10}	0.03	630900	4420250	10.00	295.37	0.00001	1.01
Bald Mountain Mine Properties	1362001a	PM_{10}	0.03	617000	4423100	10.67	322.04	0.356	0.30
	1362001b	PM_{10}	0.002	617000	4423100	10.67	588.71	2.329	0.30
	1362001b	PM_{10}	0.002	617000	4423100	10.67	588.71	2.329	0.30
	1362002	PM_{10}	0.0001	617000	4423100	10.67	588.71	2.329	0.30
	1362002	PM_{10}	0.0001	617000	4423100	10.67	588.71	2.329	0.30
	1362003a	PM_{10}	0.01	617000	4423100	10.67	310.93	4.858	0.91
	1362003b	PM_{10}	0.0001	617000	4423100	10.67	310.93	4.858	0.91
	1362003b	PM_{10}	0.000	617000	4423100	10.67	310.93	4.858	0.91
	1362001	NO_x	0.056	617000	4423100	10.67	747.04	10.083	0.13
	1362002	NO_x	0.001	617000	4423100	10.67	588.71	2.329	0.30
	1362003	NO_x	0.016	617000	4423100	10.67	310.93	4.858	0.91
Cooper & Sons, Inc.	1377am	PM_{10}	0.74	688350	4356200	10.00	295.37	0.00001	1.01
	1377am	PM_{10}	0.62	688350	4356200	10.00	295.37	0.00001	1.01
	1377am	NO_x	0.406	688350	4356200	10.00	295.37	0.00001	1.01
Country Construction	1417001	PM_{10}	0.42	685820	4353520	10.00	295.37	0.00001	1.01
White Pine County School District	1466001	PM_{10}	0.26	684170	4346840	12.19	449.82	0.00003	0.46

TABLE 2-7 (continued)

NEARBY SOURCE EMISSION RATES AND STACK PARAMETERS

Facility Name	Source ID	Pollutant	Emission Rate (g/s)	UTM Location (mE)	UTM Location (mN)	Stack Height (meters)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (meters)
	1466001	SO_2	0.01	684170	4346840	12.19	449.82	0.00003	0.46
	1466001	NO_x	0.041	684170	4346840	12.19	449.82	0.00003	0.46
Chevron Environmental Management Company	1594001	NO_x	0.053	683560	4347130	10.00	295.37	0.00001	1.01
U.S. Army - Dugway Proving Ground - Utah	10706	SO_2	0.66	820553	4448686	10.00	422.00	9.14	0.30

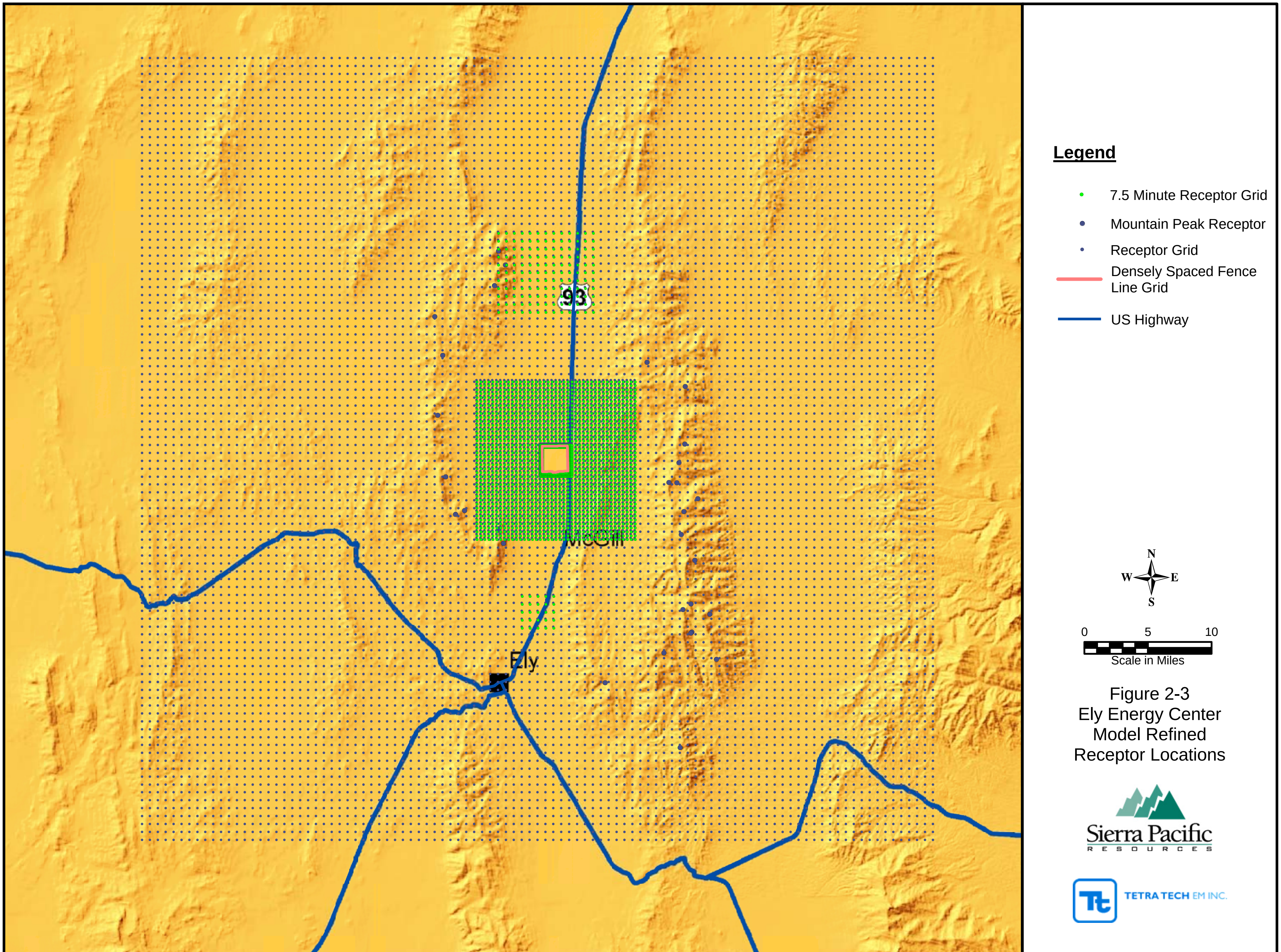

Figure 2-3
Ely Energy Center
Model Refined
Receptor Locations

6-8-2007 S:\Project\sppco\steptoe\GIS\Receptor_MapFigure2-4_rev1.mxd Kurt.Cholak

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2.7 SUMMARY OF MODELING RESULTS

The modeling results presented in this summary are based on data from on-site EEC data as discussed below. Attachment C provides a compact disk of the electronic modeling files.

2.7.2 EEC On-Site Meteorological Data

The dispersion modeling results discussed in this section are based on modeling conducted using the EEC on-site meteorological data collected from September 2006 through August 2007.

The significant impact analysis showed that maximum CO concentrations are below modeling significance levels for the EEC sources; therefore, operation of the EEC sources will not significantly impact ambient CO concentrations. No further analysis of CO is necessary. Table 2-8 summarizes the modeled impacts from the proposed EEC sources and compares them with applicable SILs. Figures 2-4 through 2-6 show significant impact areas for NO_2, SO_2, and PM_{10}, respectively.

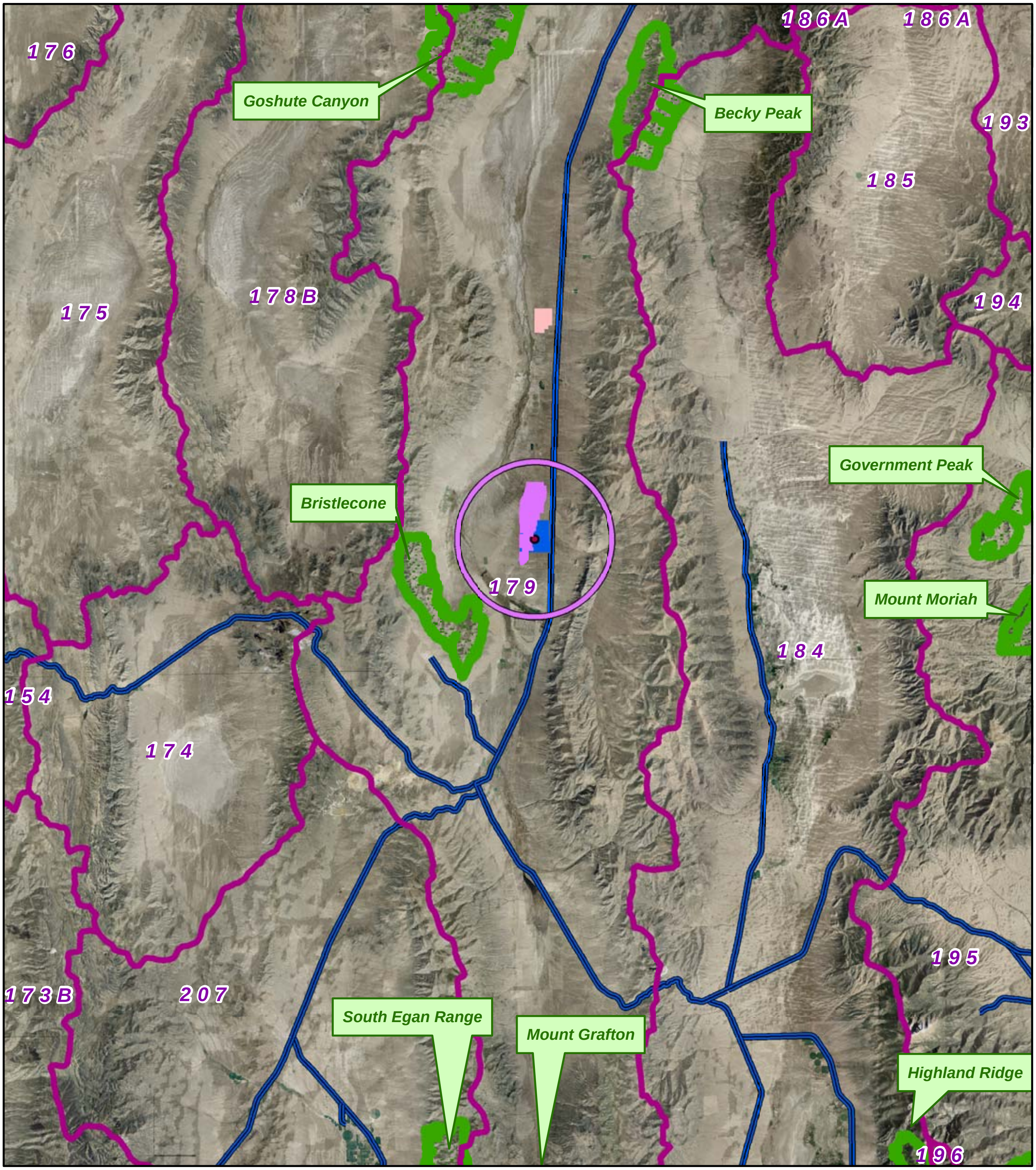
TABLE 2-8

EEC ON-SITE METEOROLOGICAL DATA

SIGNIFICANT IMPACT MODELING RESULTS

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)[(a)]	SIL ($\mu g/m^3$)[(a)]	Location UTM-X (meters)	Location UTM-Y (meters)
NO_2	Annual	3.4	1	689400	4376951
PM_{10}	24 hours	25.5	5	689850	4376957
	Annual	8.9	1	689875	4376957
SO_2	3 hours	173	25	697364.6	4375600
	24 hours	17.5	5	697364.6	4375600
	Annual	0.89	1	698000	4394100
CO	1 hour	648	2,000	697364.6	4375600
	8 hours	161	500	690331	4373371

Note:
a The NO_X to NO_2 conversion factor of 0.75 was applied.



Legend

- Ely Energy Center
- White Pine Energy Station
- Wilderness Area
- Major Road
- Hydrographic Area

Annual NO_2 Significant Impact Level (SIL) (ug/m^3)

1.0 ug/m^3

N W E S

0 12 Miles

Figure 2-4
EEC
NO_2 Significant Impacts

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Ely Energy Center
SIERRA PACIFIC RESOURCES

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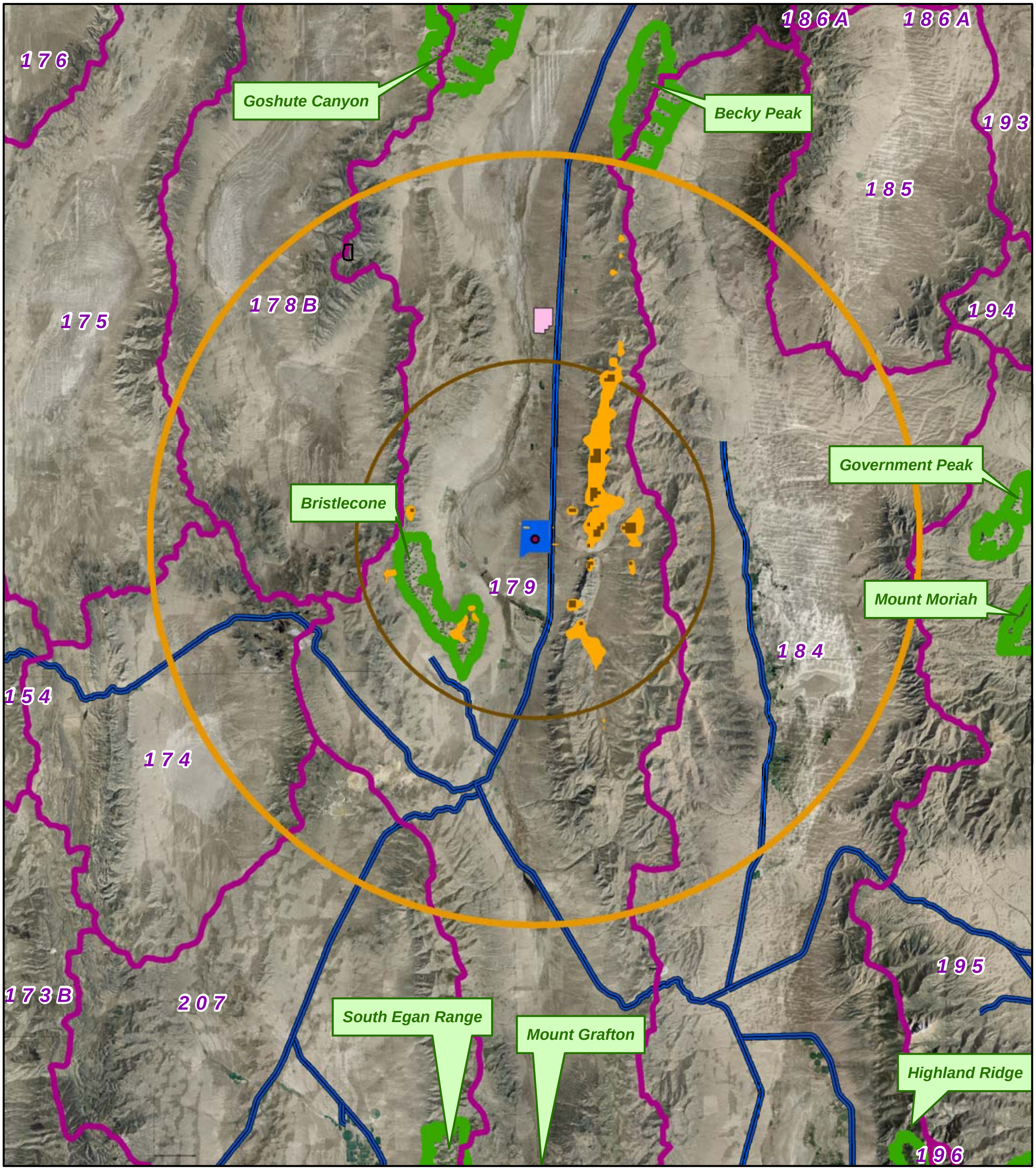

Legend

- Ely Energy Center
- White Pine Energy Station
- Wilderness Area
- Major Road
- Hydrographic Area

Significant Impact Level (SIL) (ug/m³)

- 3 - Hour SO_2 SIL 25 ug/m³
- 24 - Hour SO_2 SIL 5 ug/m³

N
W E
S

0 10 Miles

Figure 2-5
EEC
SO_2 Significant Impact Area

Ely Energy Center
Sierra Pacific Resources

Ely Energy Center
SIERRA PACIFIC RESOURCES

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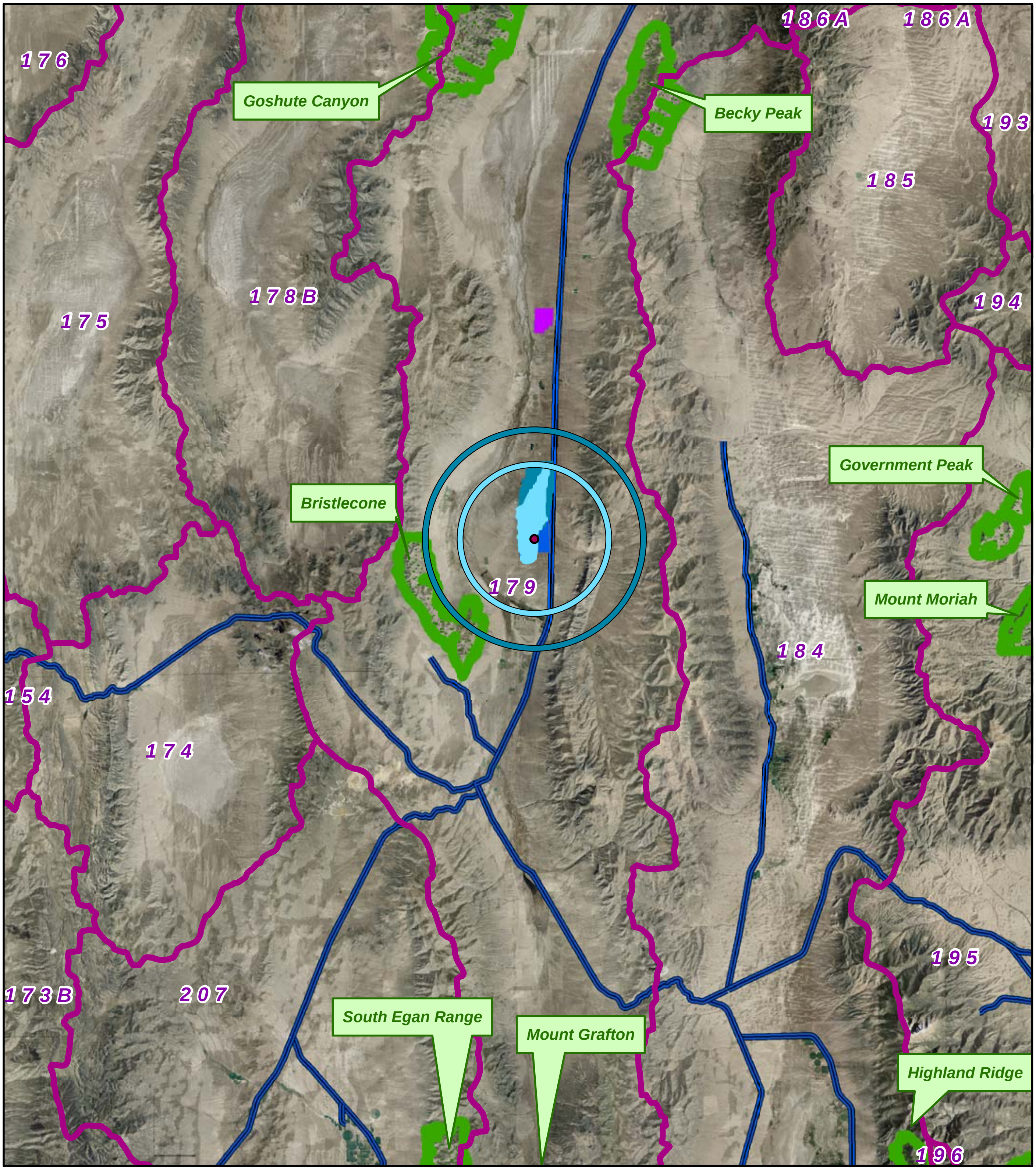

Legend

- Ely Energy Center
- White Pine Energy Station
- Wilderness Area
- Major Road
- Hydrographic Area

Significant Impact Level (SIL) (ug/m³)

- 24 - Hour PM_{10} SIL 5 ug/m^3
- Annual PM_{10} SIL 1 ug/m^3

N
W E
S

0 10 Miles

Figure 2-6
EEC
PM_{10} Significant Impacts

Ely Energy Center
Sierra Pacific Resources

Ely Energy Center
SIERRA PACIFIC RESOURCES

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Modeled concentrations of NO_2, SO_2 and PM_{10} exceeded modeling significance levels; therefore, AAQS and PSD increment analyses were performed. An analysis of maximum radius of significant impact was conducted for each of these pollutants. Table 2-9 summarizes significant impact radii for NO_2, SO_2, and PM_{10}. As shown in Figures 2-4 and 2-6, significant impact areas associated with annually averaged NO_2 and PM_{10} concentrations did not extend beyond HA-179. Annual SO_2 concentrations did not exceed the significant impact level. Therefore, no neighboring hydrographic basins would be triggered by the proposed EEC project.

TABLE 2-9

SIGNIFICANT IMPACT RADIUS DETERMINATION

Pollutant	Significant Impact Radius (km)
NO_2	8.8
SO_2	43.8
PM_{10}	12.4

Cumulative modeling for SO_2, PM_{10}, and NO_2 was conducted to include all sources within 110 km of the proposed EEC site. Cumulative modeling for SO_2, PM_{10}, and NO_2 demonstrates that the EEC project will comply with the PSD increments and AAQS levels. Table 2-10 summarizes the AAQS modeling results, and Table 2-11 summarizes the PSD increment modeling results. Modeled concentrations of VOCs and lead presented in Table 2-10 were compared with the AAQS to assess compliance with O_3 and lead standards.

The highest cumulative annual NO_2 impact with the background value added is predicted to be 8.9 $\mu g/m^3$. This value is below the AAQS value of 100 $\mu g/m^3$. The highest cumulative 24-hour and annual PM_{10} impacts within the Significant Impact Area (SIA), with background values added are 50.9 and 16.5 $\mu g/m^3$, respectively. These values are below the respective AAQS values of 150 and 50 $\mu g/m^3$. The maximum modeled cumulative high-first-high PM_{10} 24-hour and annual concentrations were predicted to be 830 and 42 $\mu g/m^3$, respectively. The locations of the receptors where these maximums were predicted are well outside of the EEC SIA, and contributions to concentrations at these receptors from EEC are less than significance levels. The highest cumulative 3-hour, 24-hour, and annual SO_2 impacts with background values added are 180, 37.0, and 9.9 $\mu g/m^3$, respectively. These values are below the respective AAQS values of 1,300, 365, and 80 $\mu g/m^3$. Nearby source impacts were not available for VOC or lead emissions; therefore, impacts from EEC sources alone were compared to AAQS values. The highest 1-hour VOC impact with background values added is predicted to be 225 $\mu g/m^3$. This value is below the AAQS value of 235 $\mu g/m^3$ for O_3. The highest monthly lead impact is predicted to be 0.0006 $\mu g/m^3$. This value is below the AAQS value of 1.5 $\mu g/m^3$ for quarterly lead concentrations.

TABLE 2-10
EEC ON-SITE METEOROLOGICAL DATA
NEVADA AAQS MODELING RESULTS

Pollutant	Averaging Period	Cumulative Highest Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Nevada AAQS[(a)] ($\mu g/m^3$)
NO_2	Annual	5.2[(b)(c)]	3.7	8.9	100
SO_2	3 hours	176[(c)]	4.0	180	1,300
	24 hours	34.0[(c)]	3.0	37.0	365
	Annual	6.9[(c)]	3.0	9.9	80
PM_{10}	24 hours	31.9[(c)(d)]	19.0	50.9	150
	Annual	9.4[(c)(d)]	7.0	16.5	50
Lead	Monthly	0.00059[(e)]	NA	0.00059	1.5
O_3	1 hour	57.7[(e)(f)]	167	225	235

Notes:
a National and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.
b The NO_x to NO_2 conversion factor of 0.75 was applied.
c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.
d Cumulative modeling concentrations are within the Significant Impact Area (12,432 m from the main stack).
e From EEC sources only
f High-second-high concentration in accordance with National AAQS.

TABLE 2-11
EEC ON-SITE METEOROLOGICAL DATA
PSD MODELING RESULTS

Pollutant	Averaging Period	Cumulative PSD Increment Consumption ($\mu g/m^3$)[(a)]	PSD Increment ($\mu g/m^3$)
NO_2	Annual	5.2[(b)(c)]	25
SO_2	3 hours	94.4[(c)]	512
	24 hours	27.4[(c)]	91
	Annual	6.9[(c)]	20
PM_{10}	24 hours	25.8[(c)(d)]	30
	Annual	9.4[(c)(d)]	17

Notes:
a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)
b The NO_x to NO_2 conversion factor of 0.75 was applied.
c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.
d Cumulative modeling concentrations are within the Significant Impact Area (12,432 m from the main stack).

The modeled 3-hour SO_2 increment consumption is 94.4 μg/m^3, which is below the PSD increment of 512 μg/m^3. The modeled 24-hour SO_2 increment consumption is 27.4 μg/m^3, which is below the PSD increment of 91 μg/m^3. The annual SO_2 increment consumption is 6.9 μg/m^3, which is below the PSD increment of 20 μg/m^3. The modeled 24-hour PM_{10} increment consumption within the SIA is 25.8 μg/m^3, which is below the PSD increment of 30 μg/m^3. The annual PM_{10} increment consumption within the SIA is 9.4 μg/m^3, which is below the PSD increment of 17 μg/m^3. The maximum modeled cumulative high-second-high PM_{10} 24-hour and high-first-high annual concentrations were predicted to be 228 and 42 μg/m^3, respectively. The locations of the receptors where these maximums were predicted are well outside of the EEC SIA, and contributions to concentrations at these receptors from EEC are less than significance levels. The annual NO_2 increment consumption is 5.2 μg/m^3, which is below the PSD increment of 25 μg/m^3. Figures 2-7 through 2-19 show applicable plots of AAQS and PSD impact contours for NO_2, $PM_{10,}$ SO_2 and O_3.

Based on the modeling results presented, the EEC will comply with all applicable AAQS and PSD increment consumption limits. In addition, based on a review of annual SIL modeling and contour plots, significant impacts from EEC should not extend beyond HA 179 and into another hydrographic basin.

Figure 2-7
NO2 Annual AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

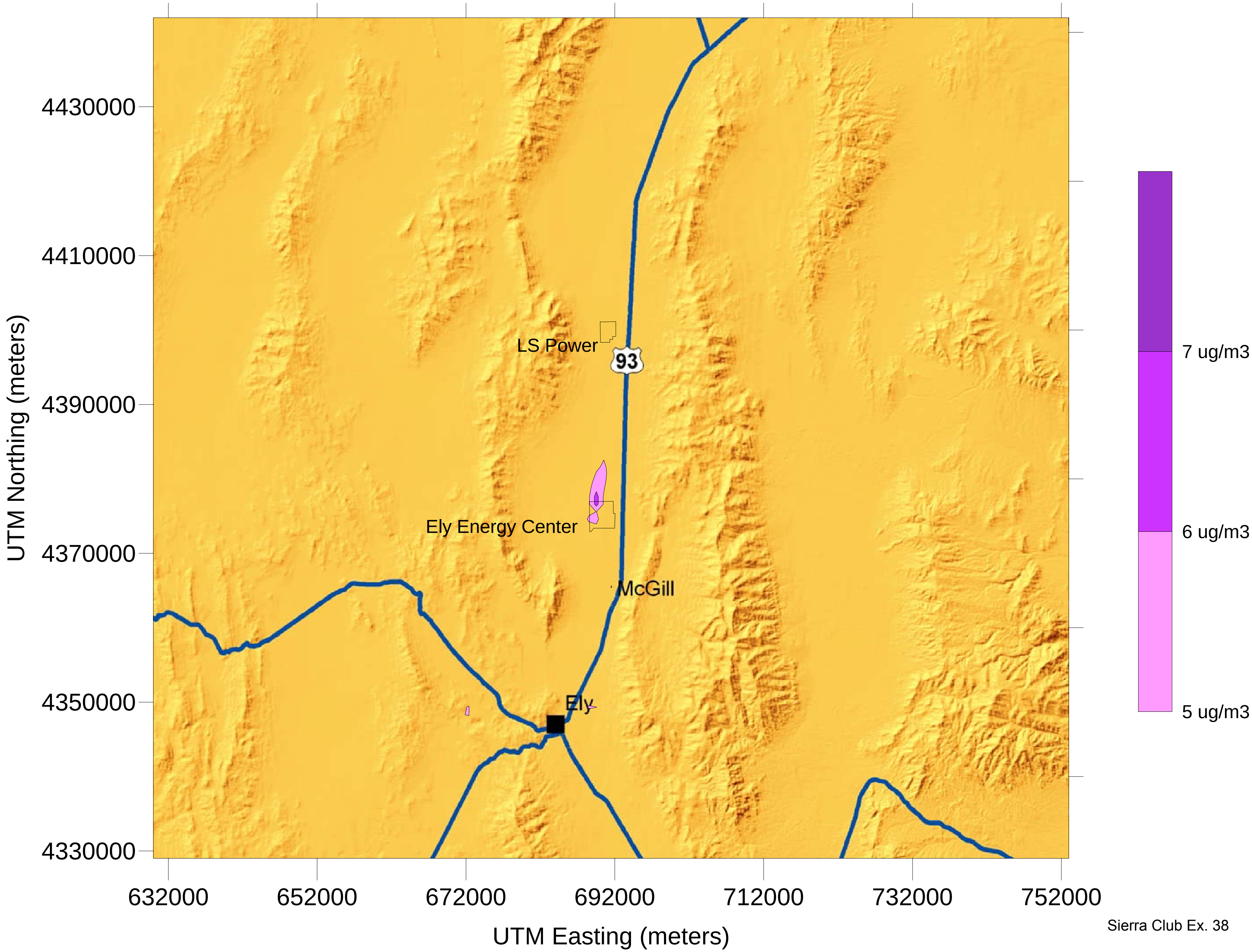

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Figure 2-8
PM10 24-Hour AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

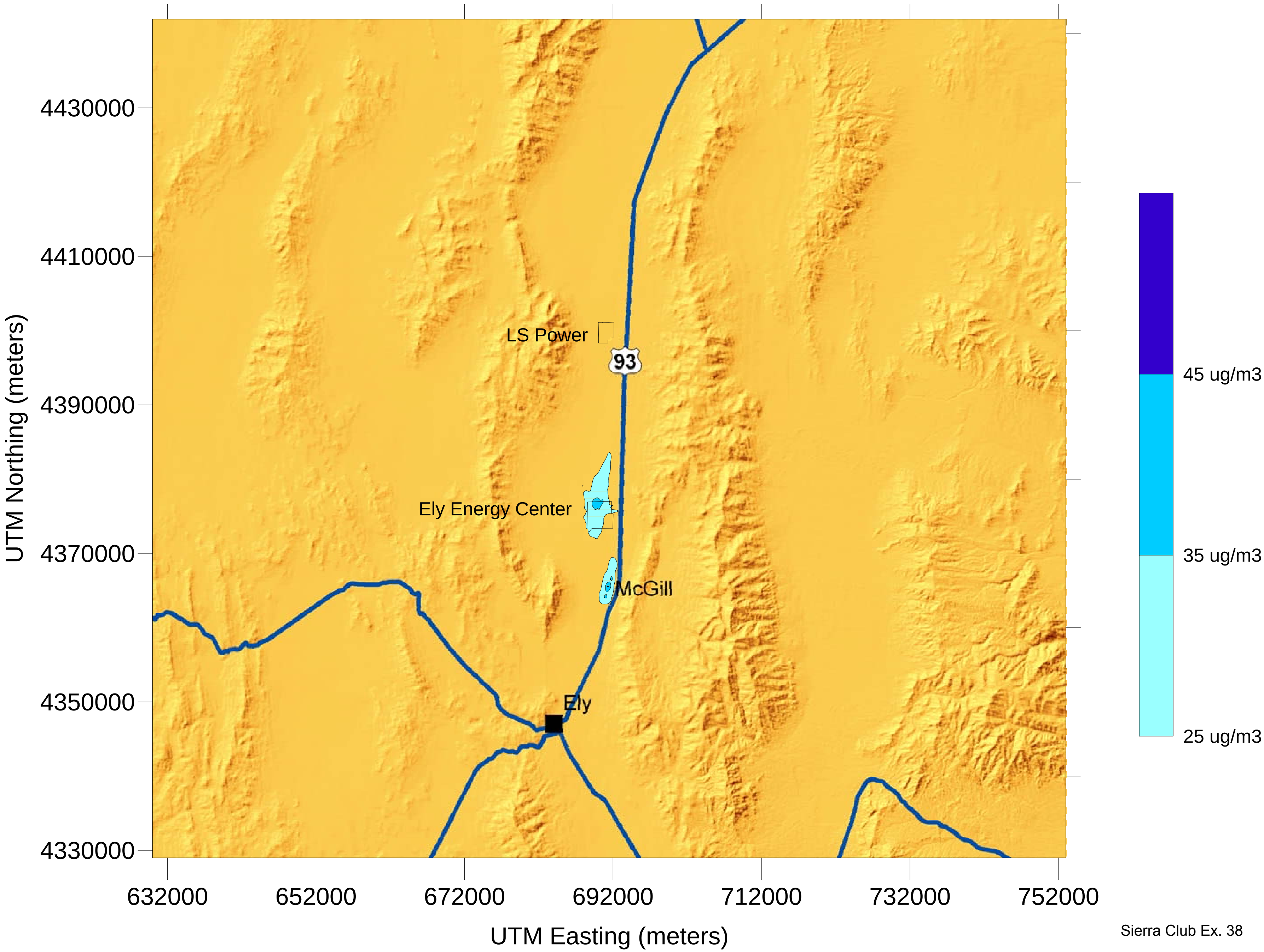

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Figure 2-9
PM10 Annual AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

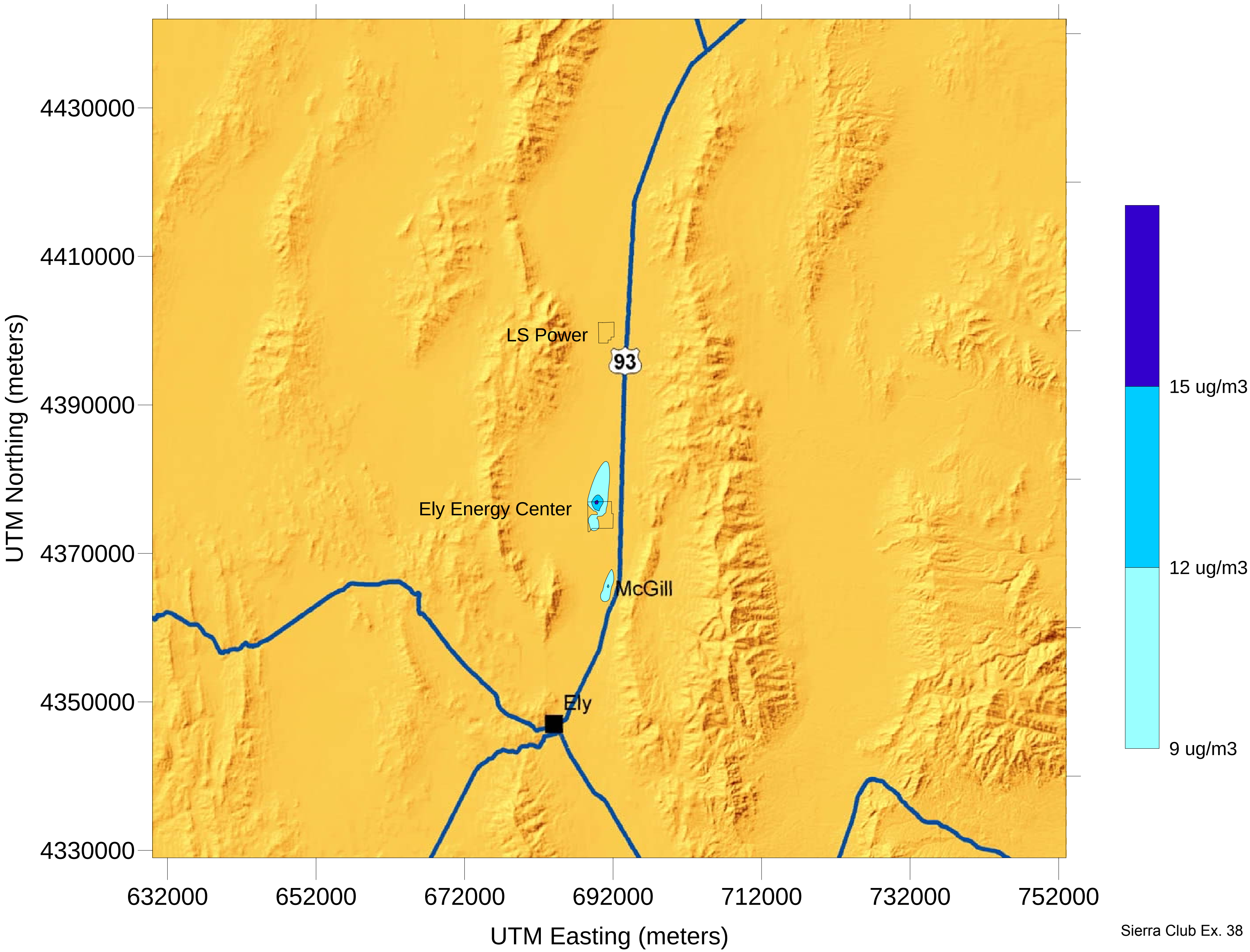

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Figure 2-10
SO2 3-Hour AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

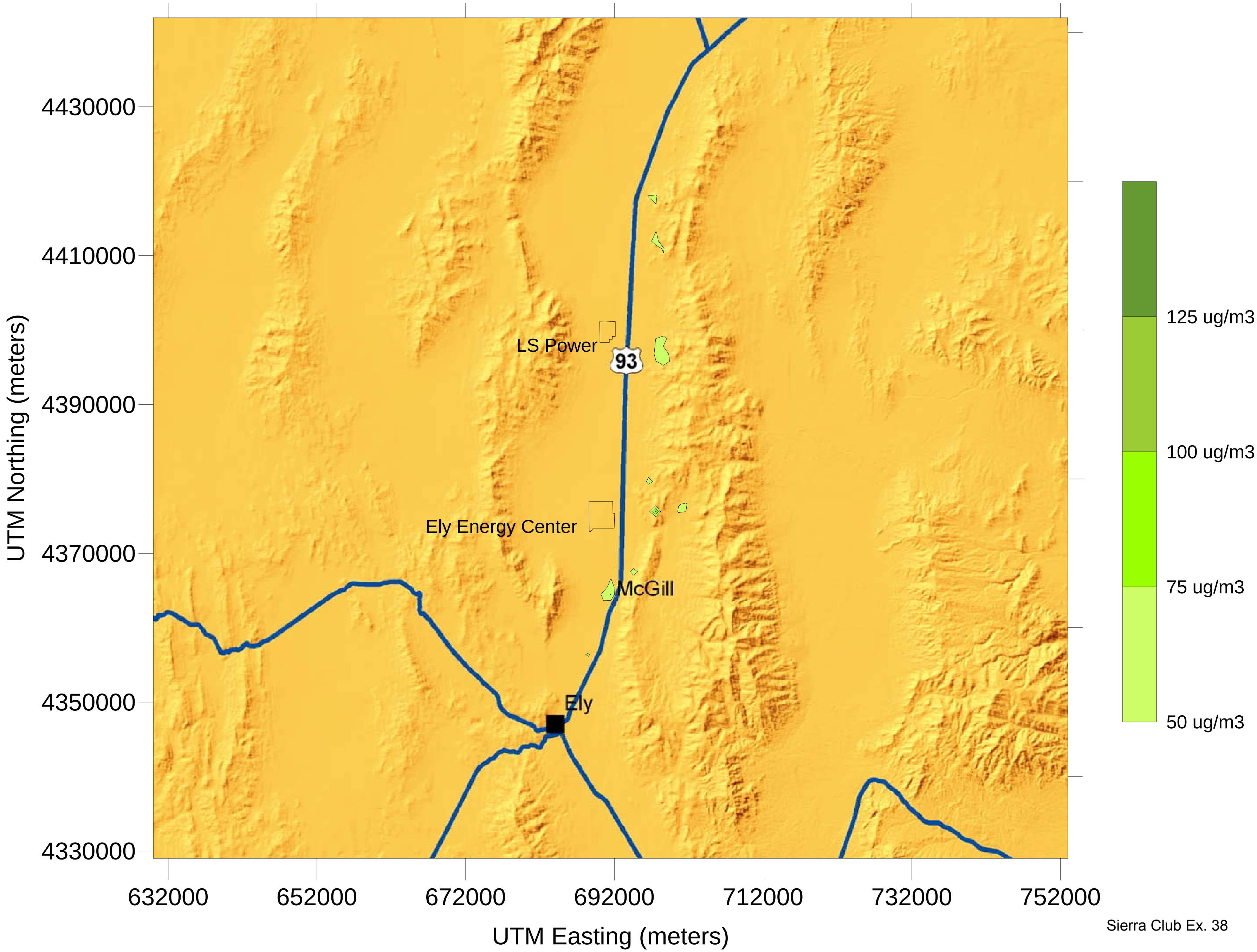

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Figure 2-11
SO2 24-Hour AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

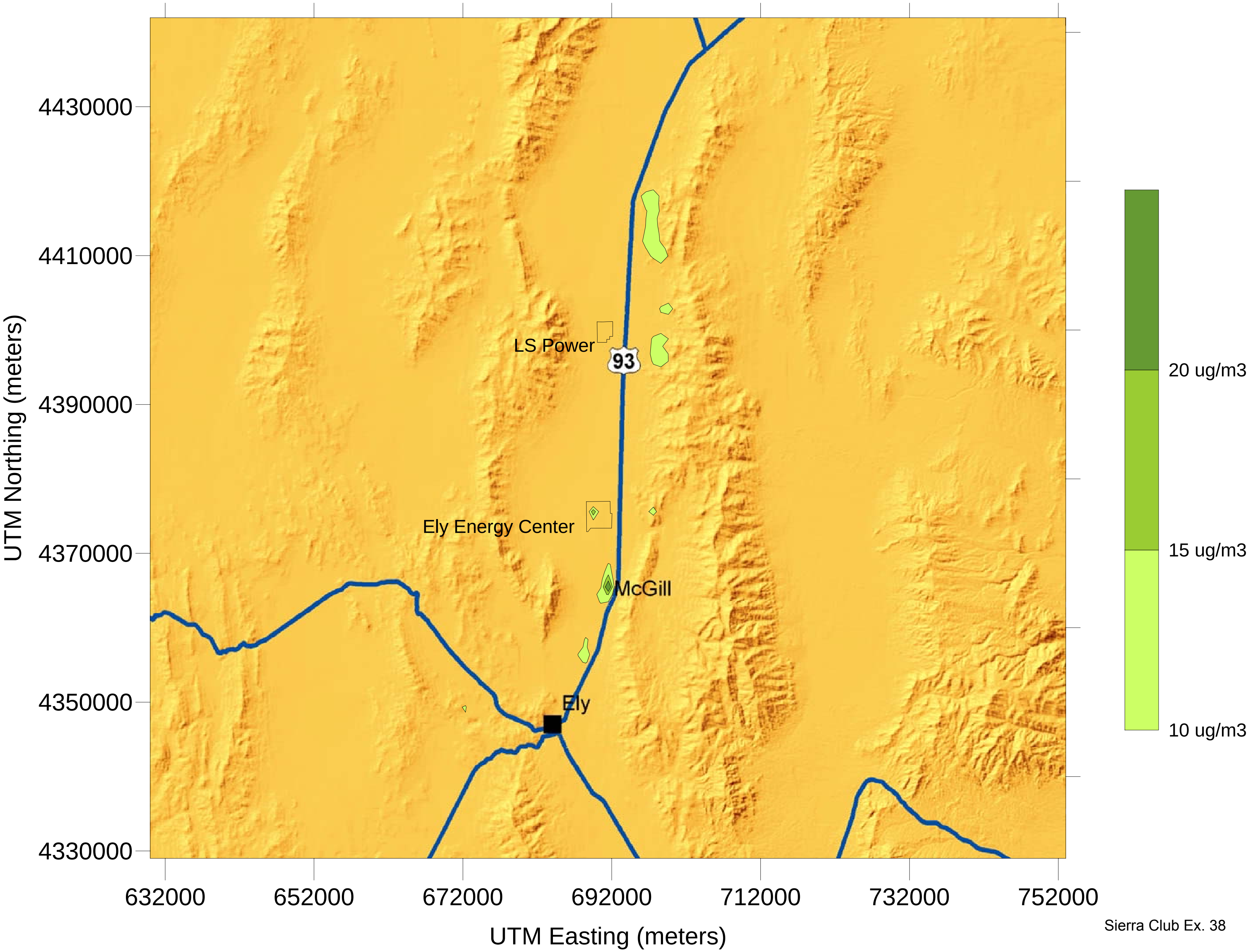

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Figure 2-12
SO2 Annual AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

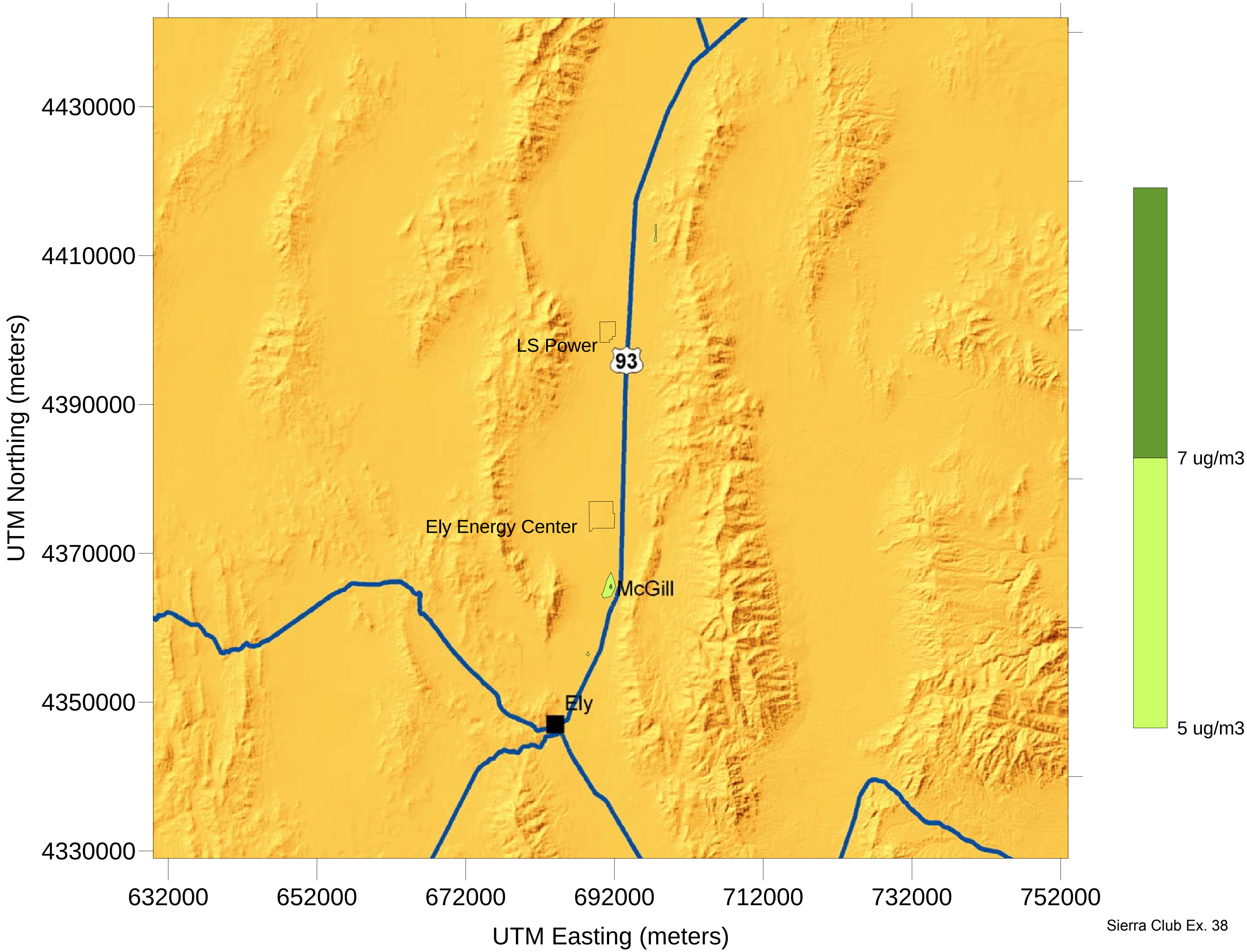

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Figure 2-13
O3 1-Hour AAQS Impacts
Sierra Pacific Power Co. - Ely Energy Center

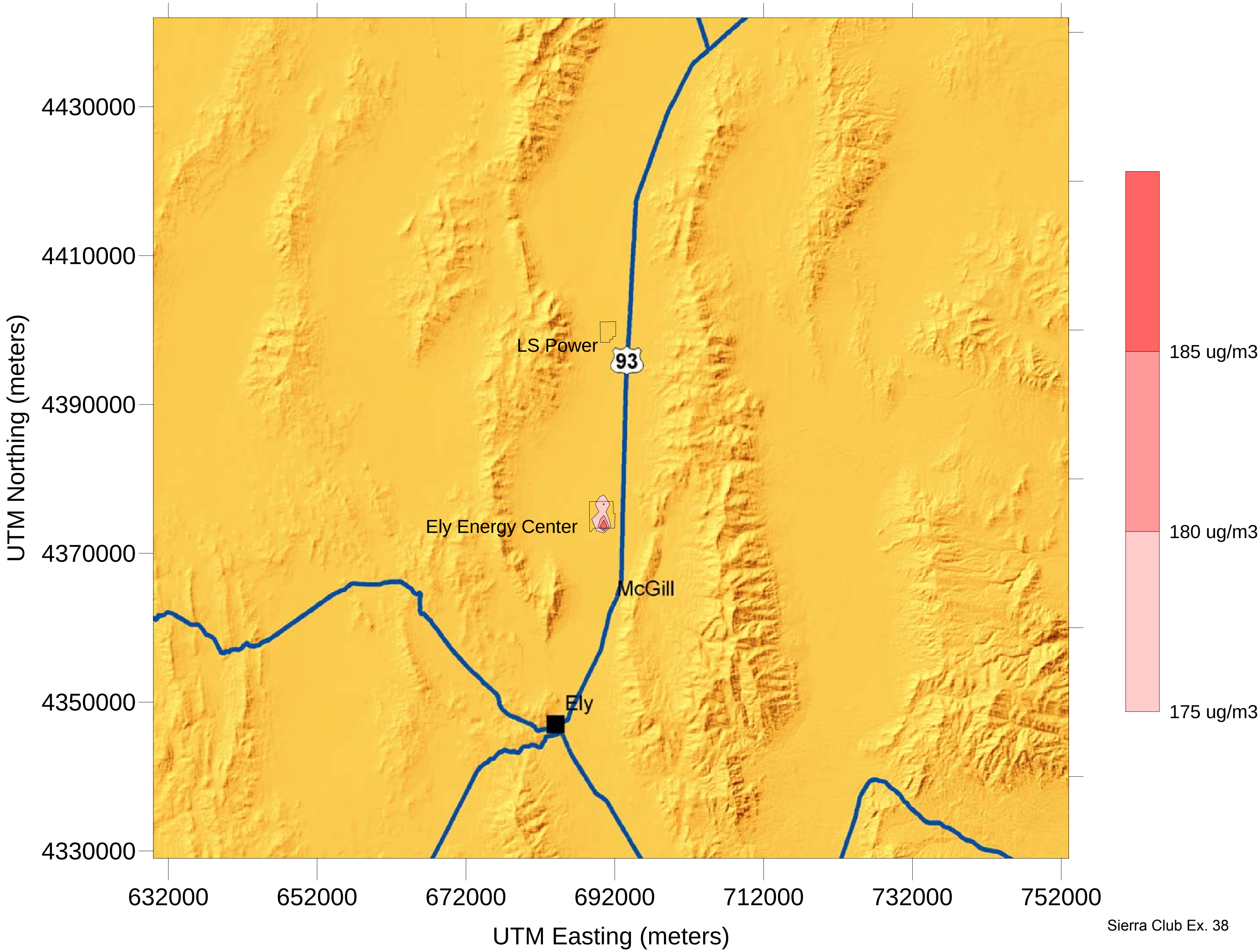

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Figure 2-14
NO2 Annual PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center

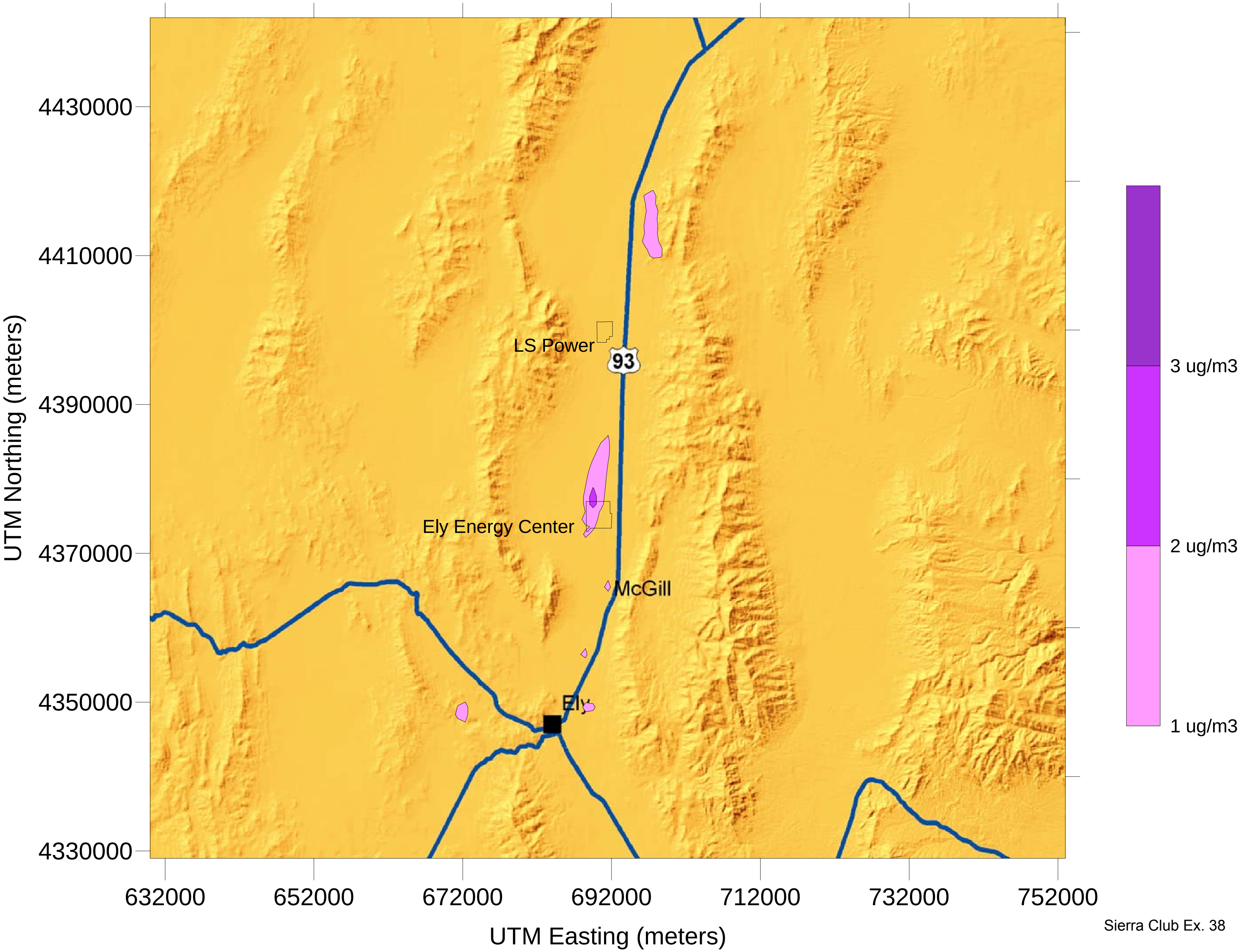

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Figure 2-15
PM10 24-Hour PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center

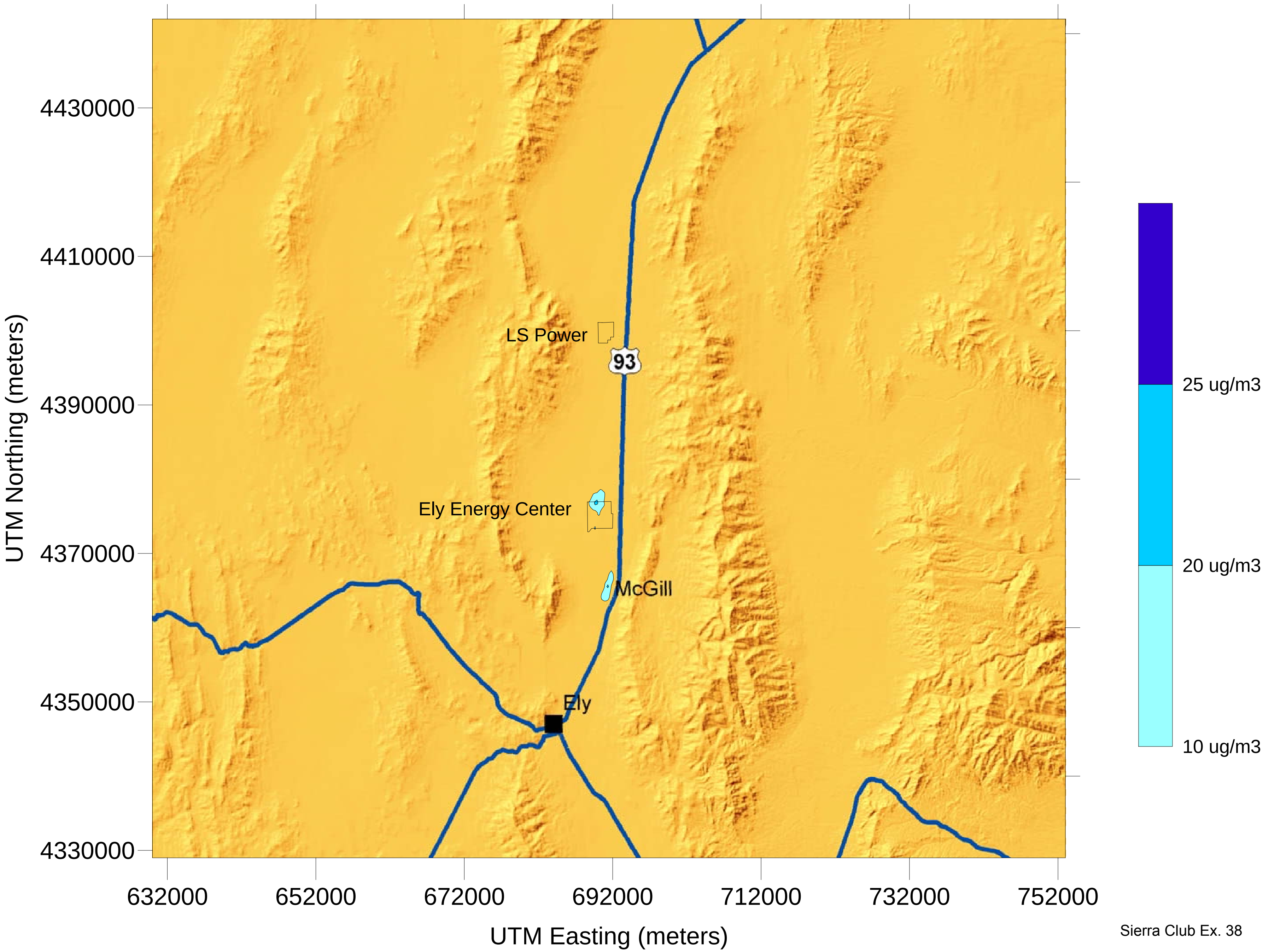

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Figure 2-16
PM10 Annual PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center

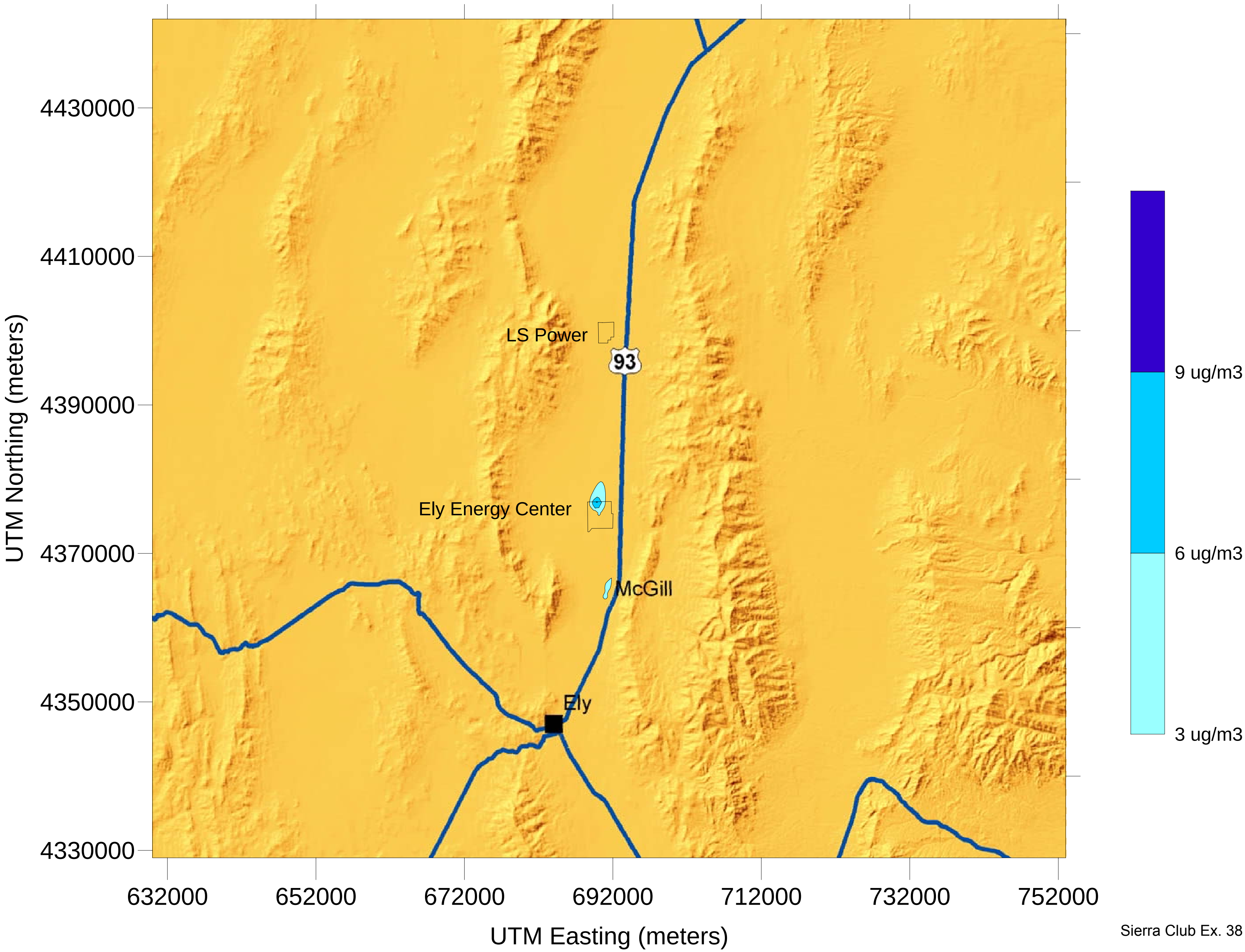

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Figure 2-17
SO2 3-Hour PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center

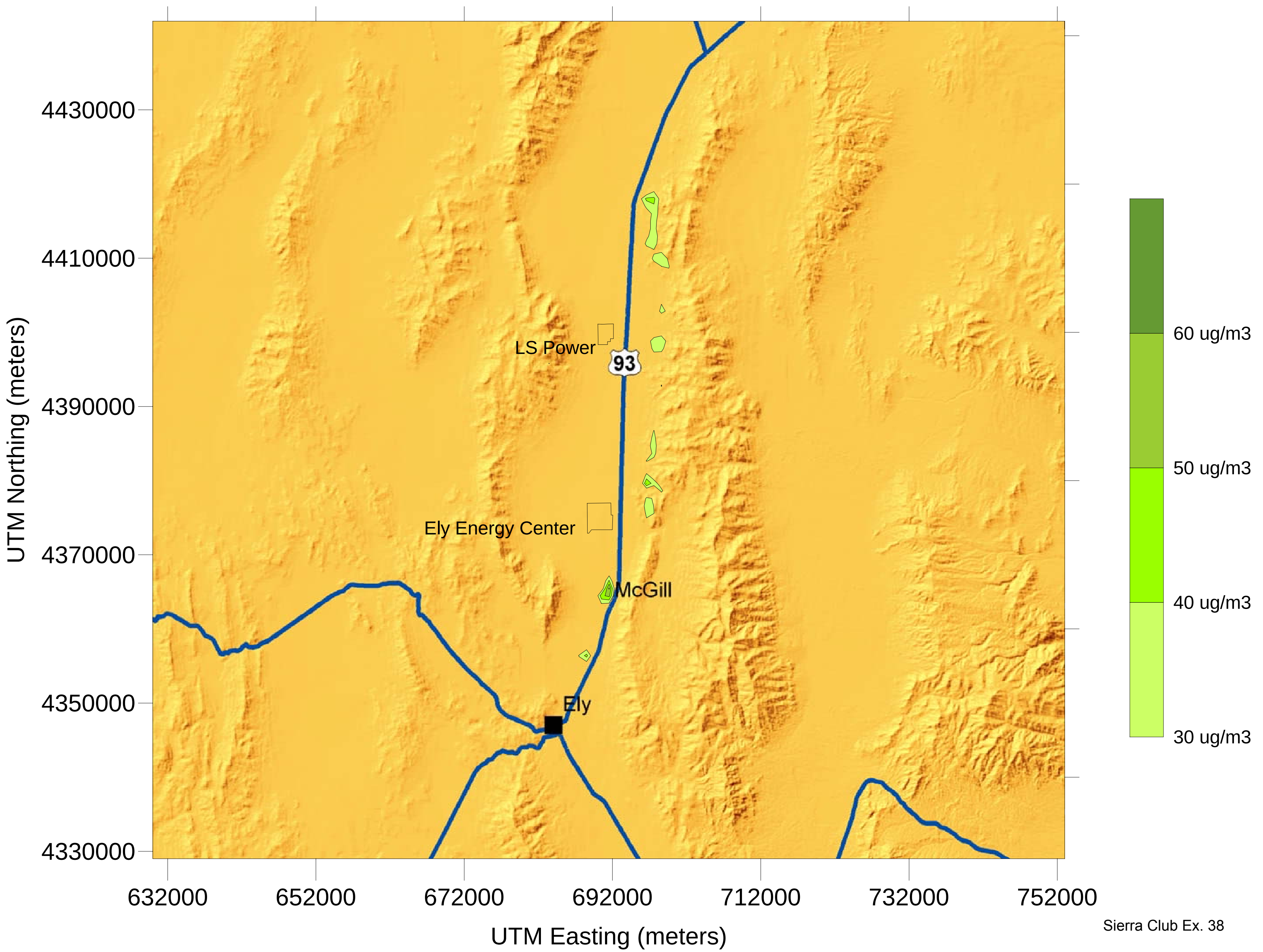

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Figure 2-18
SO2 24-Hour PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center

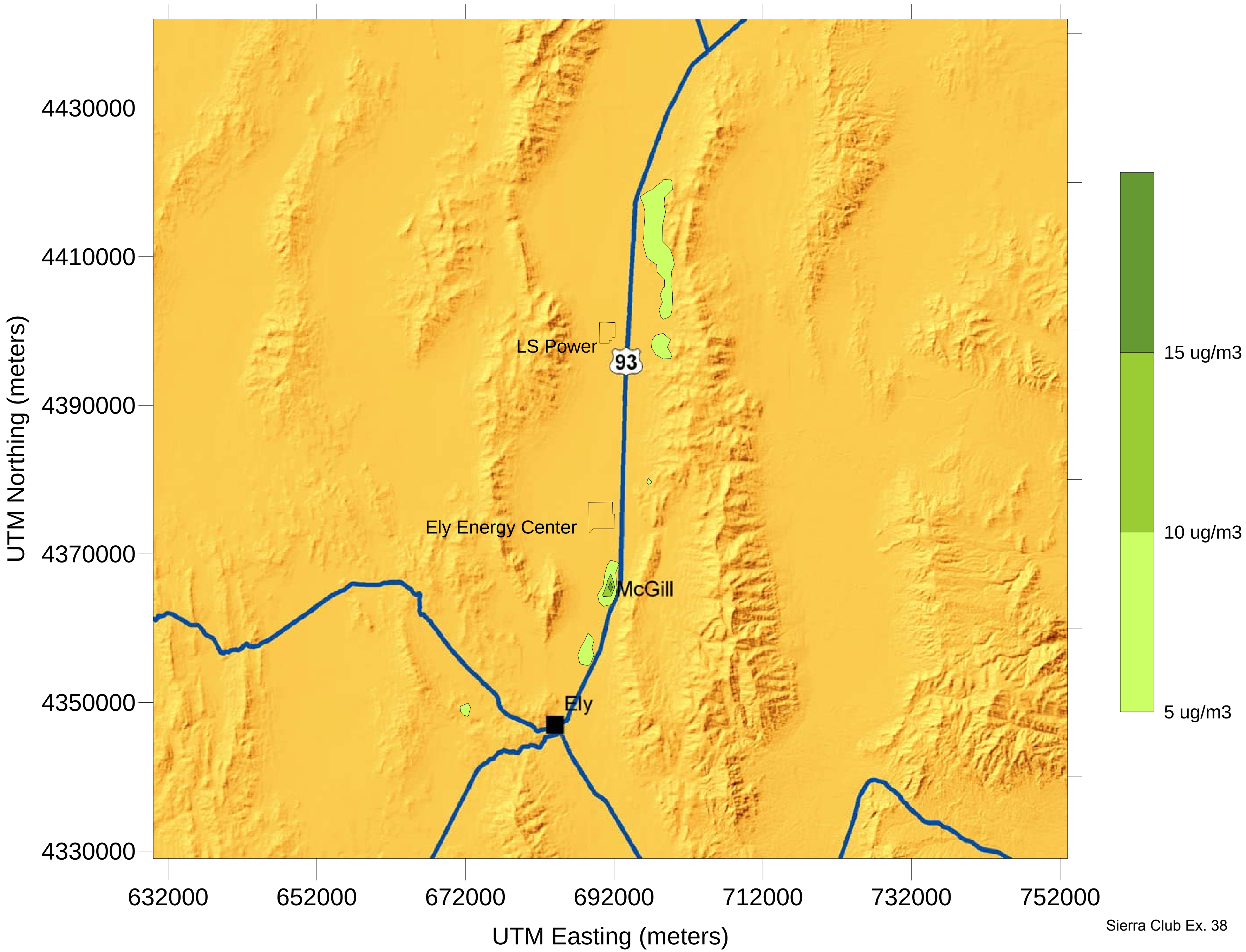

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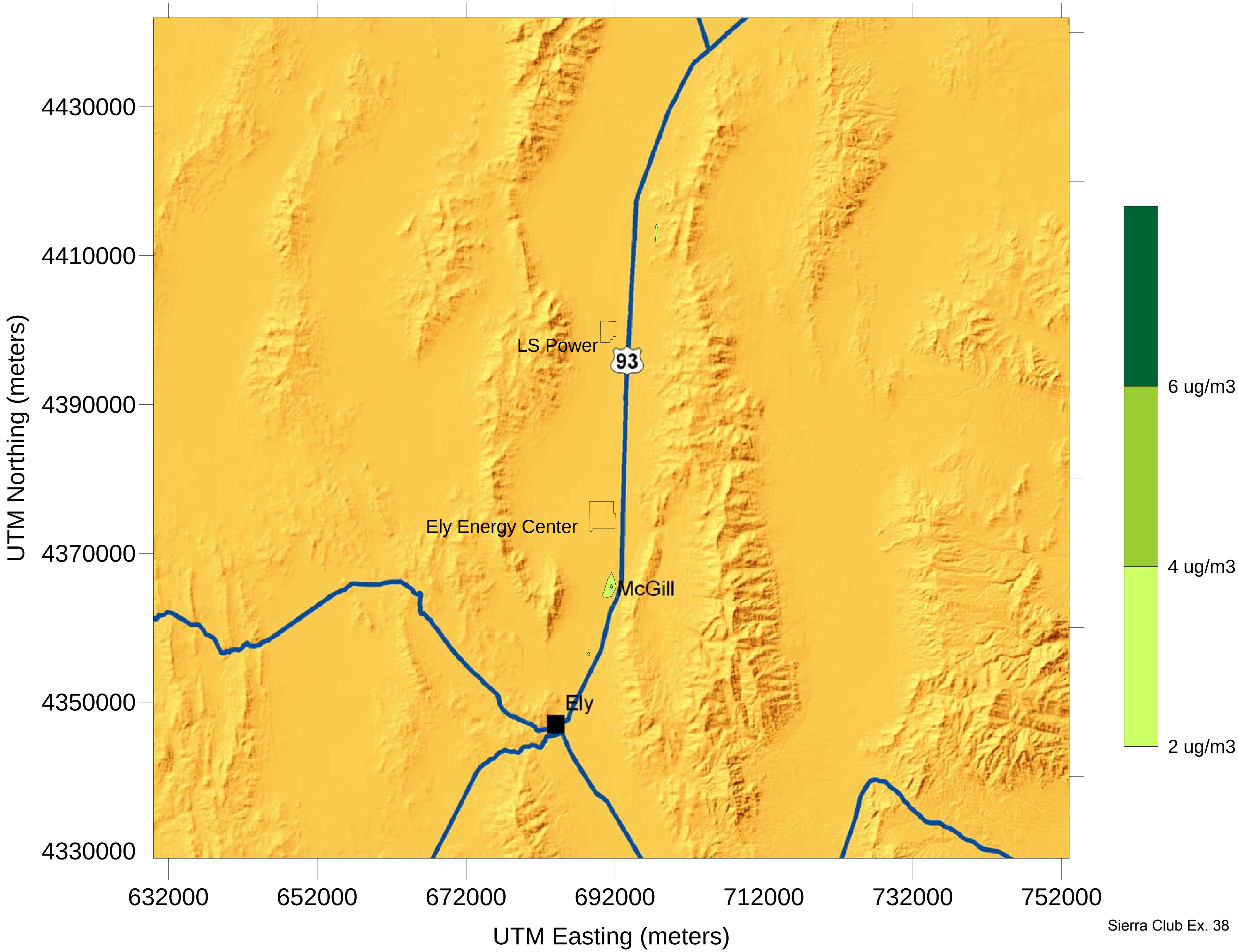
Figure 2-19
SO2 Annual PSD Increment Consumption
Sierra Pacific Power Co. - Ely Energy Center



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3.0 LONG-RANGE AIR IMPACT ANALYSIS

This section identifies the technical approach for the PSD long-range AQIA for the proposed EEC and also presents the modeled impacts. This modeling was completed to assess the potential air quality impact of the proposed EEC at two Class I areas and two Class II areas that are controlled by federal land managers (FLM). Class I areas are national parks and wilderness areas designated under the *Clean Air Act* and afforded special protection from adverse air quality impacts. Class II FLM areas are parks, wilderness areas, or other valued areas not under Class I protection.

The FLMs request a long-range dispersion modeling analysis for any Class I areas that lie between 50 and 300 km of a proposed source. The Class I areas within this range of the EEC include Jarbidge Wilderness Area (WA) located approximately 235 km north-northwest of the EEC in Nevada and Zion National Park (NP) located approximately 250 km southeast of the EEC in Utah. In addition, two Nevada Class II areas were evaluated using the long-range modeling methodology at the request of the National Park Service (NPS) and the U.S. Forest Service (USFS). Great Basin NP and Ruby Lake National Wildlife Refuge (NWR) were both evaluated for the long-range modeling analysis, and modeling results were compared with Class II criteria. Great Basin NP is located 63 km southeast of the EEC, and Ruby Lake NWR is located 86 km northwest of the EEC. Each of these areas is located further than 50 km and less than 300 km from the EEC. No FLM areas are closer than 50 km from the EEC. Figure 3-1 depicts the Class I and Class II FLM areas included in this analysis along with the proposed location of the EEC.

The dispersion modeling analysis must include a demonstration of compliance with PSD Class I increments and other AQRVs, including visibility impairment criteria and sulfate and nitrate deposition criteria. The PSD increment and AQRV analyses involve evaluation of the long-range transport impacts of EEC emissions on the Class I areas. Three key evaluations are (1) PSD increment consumption for PM_{10}, SO_2, and NO_2, (2) visibility degradation (a haze analysis for long-range transport), and (3) impacts from deposition of acid-forming compounds on sensitive species in the study area.

The long-range impact analysis was completed to assess compliance with PSD Class I and Class II increments for PM_{10}, SO_2, and NO_2, and to assess deposition impacts and visibility impairment at the Class I areas. The Class II areas are not required to meet specific visibility and acid deposition protection levels. As such, the AQRV analyses were completed for the Great Basin