6.9 NOISE

This AFC section assesses the potential noise impacts associated with construction and operation of the VV2 Project. It includes an evaluation of potential effects on noise-sensitive receptors in the Project site vicinity, as well as on VV2 Project personnel. As required by CEC guidelines, a 25-hour noise survey was conducted to establish background noise levels in the Project area.

6.9.1 LORS Compliance

Federal, State, and local laws, regulations and ordinances relating to noise issues in the Project area are presented in Table 6.9-1.

Table 6.9-1
Noise LORS Summary

Law/Regulation/Plan	Agency Key Elements and Thresholds; Applicable Permits [a]	Where Discussed in AFC
Federal		
Federal Noise Control Act of 1972 (40 CFR 204)	Regulates noise emissions from operation of construction equipment and facilities; establishes noise emission standards for construction equipment and other categories of equipment; and provides standards for the testing, inspection, and monitoring of such equipment. Gives states and municipalities primary responsibility for noise control.	Section 6.9.3
Occupational Health and Safety Act of 1970 (OSHA) (29 Code of Federal Regulations [CFR] 1910.95)	Regulates the worker noise exposure to 90 dBA over an 8-hour work shift. Areas above 85 dBA need to be posted as high noise level areas and hearing protection will be required.	Section 6.9.3
Levels of Environmental Noise – EPA	In 1974, EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. EPA determined that an Ldn of 55 dBA protects the public from indoor and outdoor activity interference.	Section 6.9.3

Table 6.9-1
Noise LORS Summary

Law/Regulation/Plan	Agency Key Elements and Thresholds; Applicable Permits [a]			Where Discussed in AFC
State				
California Noise Control Act of 1973 (Health and Safety Code, Division 28)	Declares that excessive noise is a serious hazard to public health and welfare; establishes the Office of Noise Control with responsibility to set standards for noise exposure in cooperation with local governments or the State Legislature.			Section 6.9.3
Cal-OSHA	See Federal OSHA			Section 6.9.3
California Government Code 65300.	Establishes guidelines for the development of noise elements to City and County General Plans: The noise element is to identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all major sources of noise. The adopted noise element serves as a guideline for compliance with the state's noise insulation standards.			Section 6.9.3
Local				
San Bernardino County Ordinance – Title 8, Division 7, Chapter 9, Section 87.0905 Noise	County Ordinance that sets dBA restrictions according to land use zone and time of day:			Sections 6.9.2 and 6.9.3
	Designated Noise Land Use Zone	Time Interval	Exterior Noise[a] Leq (dBA)	
	Residential (nighttime)	7:00 am to 10:00 pm	45	
	(daytime)	10:00 pm to 7:00 am	55	
	Professional Services	Anytime	55	
	Commercial	Anytime	60	
	Industrial	Anytime	70	

Table 6.9-1
Noise LORS Summary

Law/Regulation/Plan	Agency Key Elements and Thresholds; Applicable Permits [a]			Where Discussed in AFC
City of Victorville Municipal Code, Chapter 13.01 Noise Control	Municipal Ordinance that sets dBA restrictions according to land use zone and time of day. Construction activities are typically exempt from these restrictions. :			Sections 6.9.2 and 6.9.3
	Designated Noise Land Use Zone	Time Interval	Exterior Noise [a] Leq (dBA)	
	Residential (nighttime)	7:00 am to 10:00 pm	60	
	(daytime)	10:00 pm to 7:00 am	70	
	Commercial	Anytime	75	
	Industrial	Anytime	80	
City of Victorville Noise Element	The City General Plan establishes land use compatibility guidelines for residential developments. Residential development is not allowed without a noise study to determine noise insulation requirements where exterior noise levels exceed CNEL 65.			Sections 6.9.2 and 6.9.3

Key:
dBA = A-weighted Decibel; EPA Ldn = Day-night sound level; Leq = energy average noise level.
Notes:
a. Where the measured existing ambient noise exceeds the limits, the maximum allowable noise level is increased to reflect the measured ambient noise level.

6.9.1.1 Federal LORS

In terms of LORS compliance, the Federal regulations that are applicable to the VV2 Project have been incorporated into local and state regulatory requirements. The EPA noise guidelines have been considered in developing local requirements.

The occupational noise regulations promulgated under OSHA are administered by Cal-OSHA. The noise exposure level of workers is regulated at 90 dBA over an 8-hour shift to protect hearing (29 CFR 1910.95). As needed, the appropriate onsite Project areas will

be posted as high noise level areas and hearing protection will be required. The Project will implement a hearing protection program for applicable employees and maintain exposure levels below 90 dBA.

6.9.1.2 State and Local LORS

The applicable State noise guidelines are adopted in the local general plans and ordinances. The VV2 Project plant site is within the City of Victorville and the City's Noise Element and noise ordinance would represent the local LORS. New residential development within the CNEL 65 dBA contour would require a noise study by the developer to determine noise insulation requirements. Since the VV2 Project will operate during both daytime and nighttime hours, to comply with the applicable local LORS, the Leq from the VV2 Project must not exceed 60 dBA at the nearest residential land use, 75 dBA at the nearest commercial land uses and 80 dBA at the nearest industrial land use within the City of Victorville. Construction activities are normally exempt from these noise limits, per City code Section 13.01.060, paragraph 9.

Those land uses within unincorporated County areas must not exceed 45 dBA at the nearest residential land uses, 60 dBA at the nearest commercial land uses, and 70 dBA at the nearest industrial land use within unincorporated County lands. Where ambient levels currently exceed the values stated above, the allowable limits would be increased to reflect the measured ambient levels. Construction activities are exempt from these noise limits between the hours of 7 AM and 7 PM per County Noise Ordinance Section 87.0905, paragraph (e) (C).

6.9.1.3 Involved Agencies and Local Contacts

The local agency involved in noise issues related to the VV2 Project is the City of Victorville. Contact information is provided in Table 6.9-2. No permits are required for the VV2 Project that are specific to noise issues.

Table 6.9-2
Agencies and Agency Contacts

Agency	Contact	Permit/Issue
City of Victorville 14343 Civic Drive Victorville, CA	George Duran Senior Code Enforcement Officer (760) 955-5104	City Noise Ordinance

6.9.1.4 Required Permits and Permit Schedule

The VV2 Project does not require permits that are specific to noise issues.

6.9.2 Affected Environment

The following sections provide background information on noise characteristics and describe the existing noise environment in the Project vicinity.

6.9.2.1 General Noise Characteristics

The unit of sound measurement is the decibel (dB). The dB scale is a logarithmic measure used to quantify sound power or sound pressure. A sound power level describes the acoustical energy of a sound and is independent of the medium in which the sound is traveling. As such, sound power levels are not measurable with a sound level meter, which only measures sound pressure levels. A sound pressure level is a physical measure of the pressure field a sound wave produces, and is presented in dB as the ratio of a measured pressure to a reference pressure. In air, that reference pressure is 20 micropascals (µPa).

Noise Effects on Humans. The human ear is not uniformly sensitive to all noise frequencies. Therefore, the "A" weighting scale was devised to correspond with the ear's sensitivity. The A-weighting scale uses specific weighting of sound pressure levels from about 31.5 Hz to 8 kilohertz (kHz) for the purpose of determining the human response to sound. The resulting unit of measure is the A-weighted decibel (dBA).

Because noise levels can vary over a given time period, they are quantified further using the Equivalent Sound Level (Leq) and Day-Night Sound Level (Ldn). The Leq is an average of the time-varying sound energy for a specified time period. The Ldn is an average of the time-varying sound energy for one 24-hour period, with a 10 decibel addition to the sound energy for the time period of 22:00 to 07:00 hours. In California the Community Noise Equivalent Level, CNEL, is often cited. CNEL is similar to Ldn except that the period between 20:00 and 22:00 hours have a 5 decibel addition. Ldn and CNEL are normally within 0.5 dB of each other.

Noise Propagation. In air, sound from a point source radiates according to inverse square laws either spherically or hemispherically from the source, depending on whether the noise source is near a reflecting surface such as the ground. Consequently, sound will decrease at a rate of 6 dB per doubling of distance from a point source. Additional decreases will occur due to sound absorption in the air, interaction with the ground, and shielding by intervening obstacles.

6.9.2.2 Plant Site and Vicinity

The study area for the VV2 Project extends out to areas that have the potential for Project-related increases in noise levels to increase by 5 dBA or more. Areas within approximately one mile from the VV2 Project site boundaries and to the edges of the Project's 100-foot transmission line ROW were evaluated. The existing noise environment at the Project site includes contributions from the following sources:

- Local street traffic in the area of the site.
- Occasional aircraft over-flights from the SCLA southwest of the site; the northern end of SCLA's north-south runway is approximately one mile from the VV2 site boundary;
- Off highway vehicles;
- Natural sound of the wind, birds and coyotes.

Ambient noise measurements were made at two locations shown in Figure 6.9.-1 Location 1 is just south of the proposed Project site and Location 2 is the nearest residence, a ranch located approximately one mile west of the VV2 site. The noise environment fluctuated greatly from hour to hour, depending on aircraft operations at SCLA. At the time the noise measurement equipment was set up, the sky was clear, temperatures were in the mid 90s, the relative humidity was 15 to 20 percent and the wind speed was light and variable. Similar weather conditions were observed the following day when the measurement equipment was taken down.

The measurements show that the area is typically quiet, except when there are aircraft operations at SCLA. As shown in Table 6.9-3, Locations 1 and 2 had similar L_{90} values; however, since Location 2 was nearer the flight track for SCLA, the Leq and L_{10} were considerably higher at Location 2. The Ldn at Location 2 was also higher because it was nearer to the flight track. Please note that there are no land uses within the area impacted by the power plant where quiet is an important attribute (e.g., residences, hospitals, libraries), and thus no land use map showing such uses is included in this AFC section.

Please note that the survey and discussion above address the noise environment in the vicinity of the VV2 plant site, which also includes the natural gas fuel, reclaimed water supply, and sanitary wastewater disposal pipelines, as well as the portion of the Project's transmission lines that are in the immediate plant vicinity. With the exception of the immediate plant site vicinity as stated above, the ambient noise survey did not cover the Project transmission system.

Table 6.9-3
Ambient Noise Measurements - May 11, 2006 to May 12, 2006

	Location 1: South Edge of Project Site				Location 2: Nearest Residence (One Mile West of Project Site)			
Hour	**Leq**	**L(10)**	**L(50)**	**L(90)**	**Leq**	**L(10)**	**L(50)**	**L(90)**
11:00	45.2	41.6	33.0	28.2	51.0	50.9	38.4	34.2
12: 00	34.3	38.0	31.1	27.2	43.7	39.9	30.9	26.3
13: 00	38.4	38.9	31.8	27.9	52.1	39.9	31.2	26.6
14: 00	49.9	52.7	38.6	30.1	64.4	56.1	39.0	29.8
15: 00	54.9	53.9	39.6	31.2	67.3	58.9	41.7	32.3
16: 00	36.3	39.1	33.1	29.6	44.3	41.6	33.4	28.2
17: 00	39.8	43.3	35.6	30.7	55.8	45.8	35.5	28.3
18: 00	39.5	43.0	35.7	31.3	45.5	47.9	40.6	35.5
19: 00	55.9	57.7	44.8	35.9	67.4	61.9	44.4	36.7
20: 00	50.7	53.1	41.3	33.8	63.9	54.2	40.9	35.1
21: 00	36.4	38.3	32.4	29.2	41.4	43.0	35.8	31.3
22: 00	28.9	30.9	27.6	26.0	39.7	36.0	31.8	29.2
23: 00	29.4	31.1	27.2	25.3	34.8	33.8	30.6	28.4
0: 00	31.3	32.6	28.9	26.8	37.0	35.0	30.5	27.5
1: 00	32.3	34.6	29.4	26.4	30.7	33.4	29.4	26.7
2: 00	33.6	36.2	30.0	26.8	33.9	32.9	29.1	26.3
3: 00	33.4	35.6	30.7	27.7	38.2	35.2	31.4	28.8
4: 00	43.6	39.9	30.9	25.7	50.9	34.8	29.7	26.7
5: 00	37.4	39.1	32.3	28.1	42.1	37.1	33.4	30.9
6: 00	37.4	37.5	32.4	30.0	44.4	38.9	34.2	31.8
7: 00	42.8	42.9	37.0	34.2	57.4	43.5	36.5	33.7
8: 00	46.6	44.6	38.0	34.3	54.4	43.4	34.5	30.3
9: 00	52.1	48.1	36.1	30.4	67.2	50.7	35.5	29.6
10: 00	45.8	40.3	33.0	28.9	51.4	43.8	33.7	29.0
11: 00	34.8	37.3	31.6	28.4	43.3	38.7	32.3	28.8
12: 00	41.5	38.3	32.3	28.9	58.3	44.0	34.0	29.1
Ldn	**47**				**60**			

6.9.3 Environmental Impacts

The following section describes the noise impacts of the VV2 Project during construction and operation.

6.9.3.1 Construction

Construction will occur over a period of approximately 27 months. The most intense activity will be related to the construction of the combined-cycle and solar thermal equipment and facilities on the main plant site. Table 6.9.4 provides a list of equipment that may be used during Project construction together with associated noise levels and estimated load factor.

Table 6.9-4
Construction Equipment Noise Emissions

Equipment	HP	Fuel Type	Load Factor (%)	Lmax @ 50 ft
Air Compressor	20	Gas	50	80
Air Compressor, Ingersoll-Rand	80	Diesel	50	82
Asphalt Paver, Cat A-8008	102	Diesel	60	80
Backhoe	48	Diesel	45	80
Backhoe, Cat, 420E	89	Diesel	50	80
Backhoe, w/Bucket	85	Diesel	50	80
Compactor, Cat CS-563	145	Diesel	60	83
Concrete Pumper	85	Diesel	20	82
Crane, 150-Ton, Manitowoc	250	Diesel	45	85
Crane, 20-Ton, TR400	185	Diesel	45	84
Crane, 225-Ton, Manitowoc, 4100W	350	Diesel	45	86
Crane, 40-Ton, Grove, TR700B	220	Diesel	45	84
Crane, 5 ton	62	Diesel	45	80
Crane, Hydraulic, 150 Ton	250	Diesel	45	85
Crane, Hydraulic, Rough Terrain, 30 Ton	125	Diesel	45	82
Crane, Hydraulic, Rough Terrain, 30 Ton	150	Diesel	45	82
Crawler, Track Type, Drill Rig, Pneumatic	305	Diesel	25	85
Crawler, Track Type, Sagging (D8 type)	305	Diesel	60	85
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	60	84
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	60	85
Digger, Transmission Type, Truck Mount	135	Diesel	50	83
Digger, Transmission Type, Truck Mount	190	Diesel	50	85
Dozer	200	Diesel	60	84

Table 6.9-4
Construction Equipment Noise Emissions

Equipment	HP	Fuel Type	Load Factor (%)	Lmax @ 50 ft
Drill Rig, Truck Mount	190	Diesel	20	79
Forklift, 10 Ton	85	Diesel	50	80
Forklift, 5 Ton	75	Diesel	50	80
Grader	110	Diesel	60	84
Grader, Cat 135H	135	Diesel	60	85
Loader, Cat, 938F	140	Diesel	55	80
Loader, Front End, w/ Bucket	145	Diesel	55	80
Motor, Auxiliary Power	5	Gas	50	73
Pickup Trucks	160	Gas	40	75
Pipelayer, Cat 561N	123	Diesel	40	82
Pneumatic tools	--	--	50	85
Roller, 5 ton	70	Diesel	20	80
Tension Machine	135	Gas	20	85
Tractor/Loader/Backhoe	80	Diesel	45	80
Trencher, Cat 140G	54	Diesel	70	80
Truck, (Candy Wagon), 1 Ton	180	Gas	40	74
Truck, Concrete Pump, International	190	Diesel	60	82
Truck, Concrete, 10 Yd	310	Diesel	40	80
Truck, Dump	250	Diesel	40	84
Truck, Dump, 10 Ton	235	Diesel	40	80
Truck, Extended Trailer, Tractor	310	Diesel	40	80
Truck, Flatbed	200	Gas	40	74
Truck, Flatbed, 1 Ton	180	Gas	40	74
Truck, Flatbed, 2 Ton	235	Gas	40	74
Truck, Flatbed, 5 Ton	235	Diesel	40	80
Truck, Flatbed, 5 Ton	235	Gas	40	74
Truck, Fuel/Lube	200	Gas	40	80
Truck, Mechanics, 1 - 2 Ton	260	Diesel	40	80
Truck, Pick-Up	180	Gas	40	75
Truck, Semi, Tractor	310	Diesel	40	80

Table 6.9-4
Construction Equipment Noise Emissions

Equipment	HP	Fuel Type	Load Factor (%)	Lmax @ 50 ft
Truck, suburban	180	Gas	40	75
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	40	80
Truck, Watering	250	Diesel	40	84
Truck, Welding	200	Gas	40	80
Truck, Wire Puller, 1 Drum	310	Diesel	40	84
Trucks, 1-Ton Flat Bed	200	Gas	40	75
Vibratory Compactor	70	Diesel	45	83
Welder	35	Diesel	45	74
Welder, Multiquip, BLW-300SS	23	Diesel	45	74
Welder, Multiquip, GA 3800	7.5	Gas	50	73
Source: U.S. Department of Transportation, 2006				

Noise levels from construction of the VV2 Project facilities will vary with the level of activity, numbers of pieces of equipment operating, and the location of the construction activity. Figure 6.9-2 shows the typical range of Ldn around the construction site based on the estimated number of equipment items operating at one time, the Project construction schedule and the equipment noise emissions characteristics shown in Table 6.9-4. The lower range of the values shown in Figure 6.9-2 represents site preparation activities in the beginning of Project construction. The higher end of the range of values in Figure 6.9-2 represents the period of construction when major Project equipment is being delivered and installed onsite, piping and electrical systems are being installed, and solar array construction also is ongoing.

Figure 6.9-2 shows that at a distance of 100 meters (340 feet) from the construction site boundary, noise levels would range from 62 dBA to 70 dBA. An on-site hearing protection program will be implemented in areas where on-site noise levels are expected to exceed OSHA limits. Noise levels are reduced 6 dB with every doubling of distance from the noise source, so that Ldn at a distance of 1,000 meters (3,940 feet) from the construction site boundary range from 47 dBA to 53 dBA. The hourly Leq would typically be 8 dB higher. Areas within 220 meters (720 feet) of the construction site may exceed the daytime noise limits for residential land uses set by the City of Victorville. However, the immediate area of the plant site contains no noise-sensitive receptors, and the area is planned for industrial uses so that no noise-sensitive land uses would be

expected to be present in the future during VV2 Project construction. Also, because of its temporary nature, construction noise is exempt from City noise limits.

Because construction equipment usage would be less in the northern site areas than in the more southerly areas where the power block is located, construction noise would be less intense in the northern areas of the site which adjoins unincorporated County land. County noise limits for residential uses may be exceeded occasionally during construction, but there are no noise sensitive receptors present in the County areas immediately adjoining the Project site. Also, construction activities are exempt from County noise limits during the hours between 7 AM and 7 PM.

The nearest sensitive land use (residence, school, library, hospital, church, etc.) to the VV2 site is a horse ranch on Colusa Road approximately one mile west of the site. The calculated noise level from construction activities is 54 dBA Leq and 46 dBA Ldn at this nearest residence. Noise levels below an Ldn (day–night average with a nighttime weighting of 10 dB) of 65 dBA and daytime noise levels of 70 dBA are considered acceptable for sensitive land uses by the City of Victorville. In short, VV2 Project construction would not be expected to result in significant noise impacts to sensitive land uses

Construction of the Project's linear facilities (pipelines and transmission lines) will use construction equipment that produce similar noise levels to the equipment used on the plant site. The noise levels will rise and fall as the construction activity approaches and passes any location along the route. The speed that construction will move along the route will vary between approximately 0.25 and 2.0 miles per day. In some cases, there will be two to five crews that will pass a given location during the period of transmission line construction. Project linear facilities construction would not result in significant noise impacts for several reasons, including: 1) the short duration of Project linears construction activity levels in any single location, 2) construction of all Project pipelines and the first segment of the Project's transmission lines will be in undeveloped areas, 3) relatively minor levels of construction activity will be required in most of transmission line Segment 2 (primarily stringing new lines on existing structures), and 4) portions of transmission line Segments 2 and 3 traverse areas that are undeveloped (no sensitive receptors nearby).

Construction worker noise exposure may exceed OSHA noise limits of 85 dBA within 15 to 20 meters of the heavy construction equipment operating onsite. In compliance with OSHA requirements, worker hearing protection programs will be implemented on the construction site in areas where the OSHA noise limits would be exceeded.

6.9.3.2 Operations

Power Plant Site. Sound associated with operation of the VV2 Project will be produced by the two combustion turbine-generators and one steam turbine-generator, two heat recovery steam generators, one wet cooling tower, a 230-kV switchyard, fuel-gas metering station; and auxiliary motors, pumps, fans, compressors, and valves.

Overall, annual availability of the VV2 facility is expected to be in the range of 90 to 95 percent. The plant's capacity factor will depend on the provisions of bilateral power sales contracts as well as market prices for electricity, ancillary services, and natural gas. The design of the power plant provides for operating flexibility (i.e., ability to rapidly start up, shut down, turn down, and provide peaking output) so that operations may be readily adapted to changing market conditions. This flexibility includes the plant's ability for a rapid start of the combined-cycle system that reduces startup time nearly in half compared to the industry standard for combined cycle plants in the U.S (see Section 2.0, Project Description).

For much of the time during the operations phase, Project equipment is expected to operate essentially continuously and produce a steady sound level. Periodic short-term noise level increases can occur during plant startup or shutdown, during load transitions, or during opening of steam relief valves to vent pressure. Noise emissions for VV2 Project equipment are listed in Table 6.9-4; these data were provided by GE, supplier of the Project's combustion equipment. Please note that GE guarantees that the average sound level measured at one meter from the edge of all equipment they supply will not exceed 85 dBA. Combined-cycle plants do not normally produce significant tones that are audible beyond the limits of the plant. Transformers do have significant tones at 120 Hz and at multiples of 120 Hz; however, these tones are masked by the balance of plant noise. Table 6.9-5 also presents the octave band levels used to model the noise for VV2.

Onsite VV2 Project operation phase noise levels were calculated using Datakustic CadnaA 3.4, based on the equipment noise emissions data in Table 6.9–5 and the planned layout of facilities on the Project site. Figure 6.9-3 presents the noise contours for the Project. Noise levels at some locations on the plant site in close proximity to the combustion turbines are anticipated to be above 85 dBA. Project operation will be required to implement administrative procedures and hearing protection measures to ensure compliance with OSHA requirements for workplace hearing protection.

The VV2 Project site is within an industrial land use area. The solar extends north and west of the combined-cycle equipment, so the nearest VV2 Project fence lines are on the north and east of the property. As shown on Figure 6.9-3, noise levels during normal

operations are expected to be well below the City of Victorville noise limits of 80 dB Leq for industrial land uses and below the 70 dB Leq for industrial land uses at the VV2 Project fence line.

The noise sources in the switchyard (including transformer and corona noise) are included in the modeling of the Project. The expected noise level at the boundary of the switchyard is below the City of Victorville noise limits of 80 dB Leq for industrial land uses and below the County of San Bernardino noise limits of 70 dB Leq for industrial land uses, as shown in Figure 6.9-3.

Offsite noise levels were calculated using the CadnaA model and the same data on Project equipment emission levels and site layout as used to calculate on-site noise levels. Figure 6.9-4 presents the Ldn noise level contours out to a distance of approximately 1,600 meters (one mile) from the site. For a 24-hour operating plant, the nighttime hourly Leq would be seven decibels less than the Ldn. The projected Leq at the nearest sensitive land use (a ranch house on Colusa Road approximately one mile west of the Project site) would be 39 dBA, less than the nighttime (10 pm to 7 am) noise limits for residential properties of the City of Victorville (60 dBA Leq) and San Bernardino County (45 dBA Leq).

Table 6.9-5
VV2 Plant Equipment Noise Emissions

Equipment Description	Sound Power Level									
	Octave Band Center Frequency, Hz									dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Gas Turbine	111	113	107	106	103	101	106	102	97	110
Gas Turbine Inlet Filter Face [a]	107	110	103	99	95	93	91	84	75	99
Gas Turbine Inlet Ducting [a]	100	99	93	91	80	73	80	53	27	87
Generator	105	105	104	101	103	102	101	96	87	107
HSRG Body	106	111	109	101	87	85	76	59	42	97
HSRG Inlet	111	116	114	107	93	91	84	67	50	102
Stack Breakout	102	109	105	97	81	73	52	40	35	92
Stack Exit	111	118	117	108	93	90	75	66	59	104
Steam Turbine	112	112	108	107	106	101	96	94	93	107
Steam Generator	106	106	105	102	104	103	102	97	88	108
Boiler Feed Pump	92	97	99	99	101	94	91	93	88	101

Table 6.9-5
VV2 Plant Equipment Noise Emissions

Equipment Description	Sound Power Level									
	Octave Band Center Frequency, Hz									dBA
	31.5	63	125	250	500	1000	2000	4000	8000	
Condensate Pump	88	93	95	96	97	90	87	89	84	98
Miscellaneous Pump	88	93	95	96	97	90	87	89	84	98
Main Step-up Transformer	0	0	115	110	100	0	0	0	0	104
Gas Metering	0	0	0	0	104	104	104	0	0	109
Cooling Tower	120	123	123	120	117	113	110	107	99	119

Sources: GE Energy; Acentech Inc.

[a] Assumes a horizontal silencer that is 8 feet long

Linear Facilities. Operation of Project linear facilities will likely produce no audible noise. The buried gas line and water supply/wastewater pipelines will be silent from any distance.

Audible noise from electrical transmission lines are related to corona effects; (corona is the ionization of the air at the surface of the energized electrical conductor and suspension hardware stemming from the high electrical field strength at the conductor surface). Corona-generated audible noise from transmission lines is generally characterized as a crackling or hissing noise. Discharges on the three different phase conductors occur at different times.

Although conductors are designed to minimize corona discharges, surface irregularities caused by damage, insects, raindrops or airborne contaminants may locally enhance the electric field strength sufficiently high for corona discharges to occur. The noise level generated by corona from overhead power lines is affected by various parameters such as:

- Atmospheric conditions,
- Line length,
- Height above ground,
- Size of conductors and their configuration,
- Type of connection,
- Bundle conductor composition,

- Voltage gradient, and
- Ground resistance.

Modern transmission lines are designed, constructed, and maintained so that during dry conditions they will operate below the corona inception voltage, meaning that the line will generate a minimum of corona-related noise. The corona hum typically would produce noise levels ranging up to 30 dBA, measured at the edge of the transmission line ROW during dry conditions. A noise level of 30 dBA would be practically unnoticeable, easily masked by other ambient noises. In foul weather conditions, water droplets and fog can produce corona discharges from high voltage lines that can be 5 to 20 dBA higher. This can occur when there is rain or when there is foggy weather.

Corona levels (and audible noise levels) are highest during heavy rain when the conductors are wet, but the noise generated by the rain likely would be greater than the noise generated by the corona, and thus the increased corona-related noise would not be noticeable. The Project's 230-kV switchyard would be on the power plant site with the nearest sensitive receptor (a residence) approximately one mile away. No significant noise impacts would be expected from Project linear facilities during operation.

6.9.3.3 Cumulative Impacts

The cumulative noise impacts associated with the VV2 Project were evaluated. The noise from the VV2 facility and noise from SCLA aviation activities will add logarithmically, increasing the noise levels for the area between the Project site and the flight paths. However, there are no residential areas or other noise-sensitive land uses between the VV2 plant site and the airport flight track. Other cumulative projects that may be developed near the VV2 site at SCLA and/or within the SCLA planning area will be industrial in nature, based on the land uses identified in SCLA Specific Plan. No significant cumulative noise impacts are expected for VV2 Project operation.

6.9.4 Mitigation Measures

The following mitigation measures will be implemented to reduce noise and ensure that Project noise impacts are less than significant.

NOISE-1 Conduct construction activities involving the use of heavy equipment during daytime hours and limit construction activities during evening, nighttime, and weekend periods to relatively quiet activities such as welding, interior installation of equipment, cabling, and instrumentation.

NOISE-2 During both construction and operation, maintain all equipment noise control equipment in good working order in accordance with manufacturers' specifications.

NOISE-3 During both construction and operation, post warning signs in high noise areas and implement hearing protection program for work areas where noise levels exceed 85 dBA.

NOISE-4 During both construction and operation, investigate, document, evaluate, and attempt to resolve legitimate Project-related noise complaints. This would involve: using CEC-suggested Noise Complaint Resolution Form or a functionally equivalent procedure, attempting to contact within 24 hours the source (person or persons) of the noise complaint, investigating to determine the Project noise source(s) that led to the complaint, and taking all feasible measures to reduce the noise at the source if the complaint is legitimate.

.**NOISE-5** Incorporate into the final design/procurement of Project facilities and equipment noise attenuation measures that ensure compliance with the noise emission values shown in Table 6.9-5.

6.9.5 References

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City of Victorville, 2000. General Plan Land Use Element. May.

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Southern California Logistics Airport, 2006. Existing Noise Contours.

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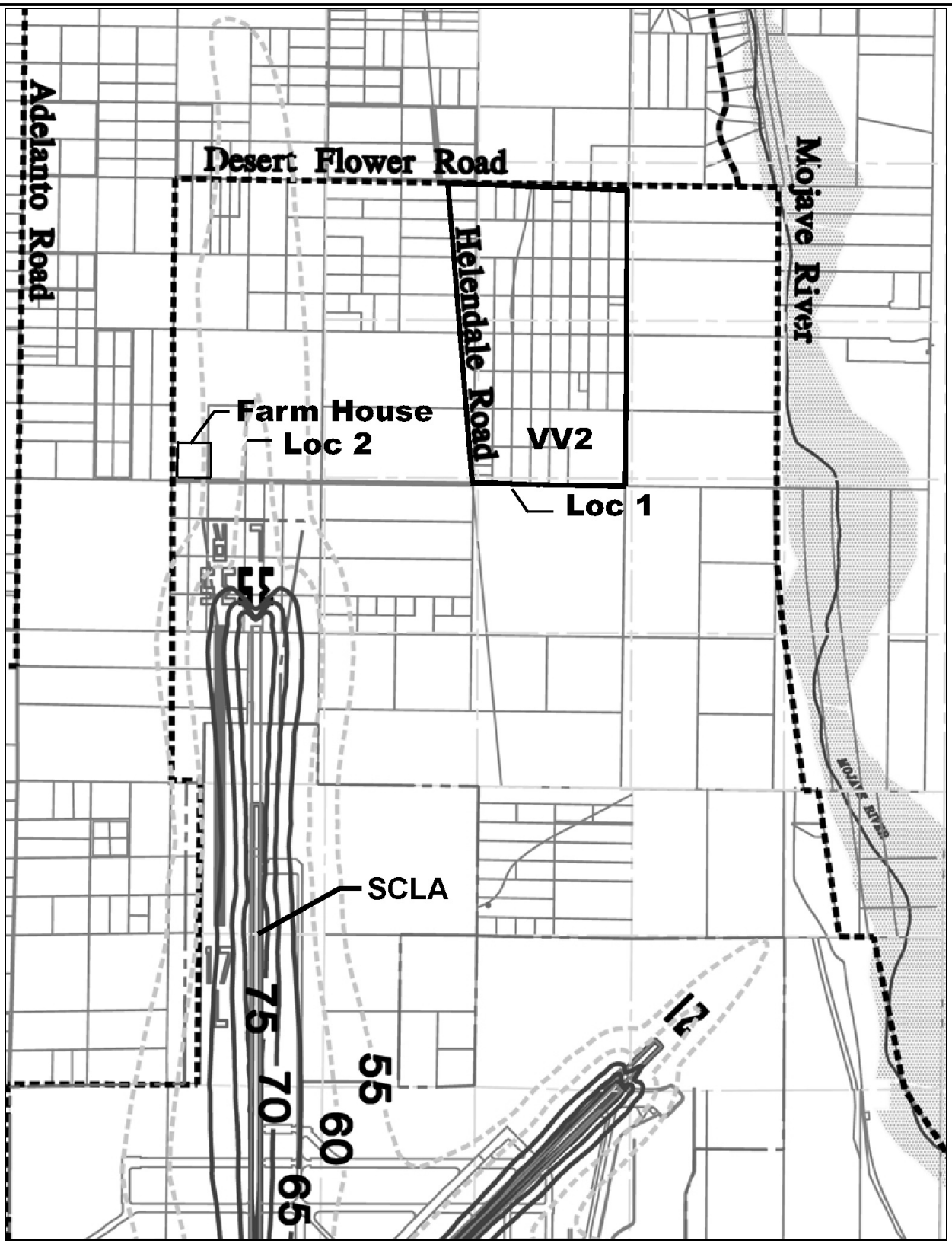
U.S. Environmental Protection Agency, 1974. “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an adequate margin of Safety”.



Locus Map

SCLA Land Noise Contours and Noise Measurement Locations
VV2 Hybrid Power Project

Noise data developed by Acentech, Inc.

Figure not to scale

Inland Energy, Inc.

ENSR | AECOM

Figure: 6.9-1

Date: February 2007

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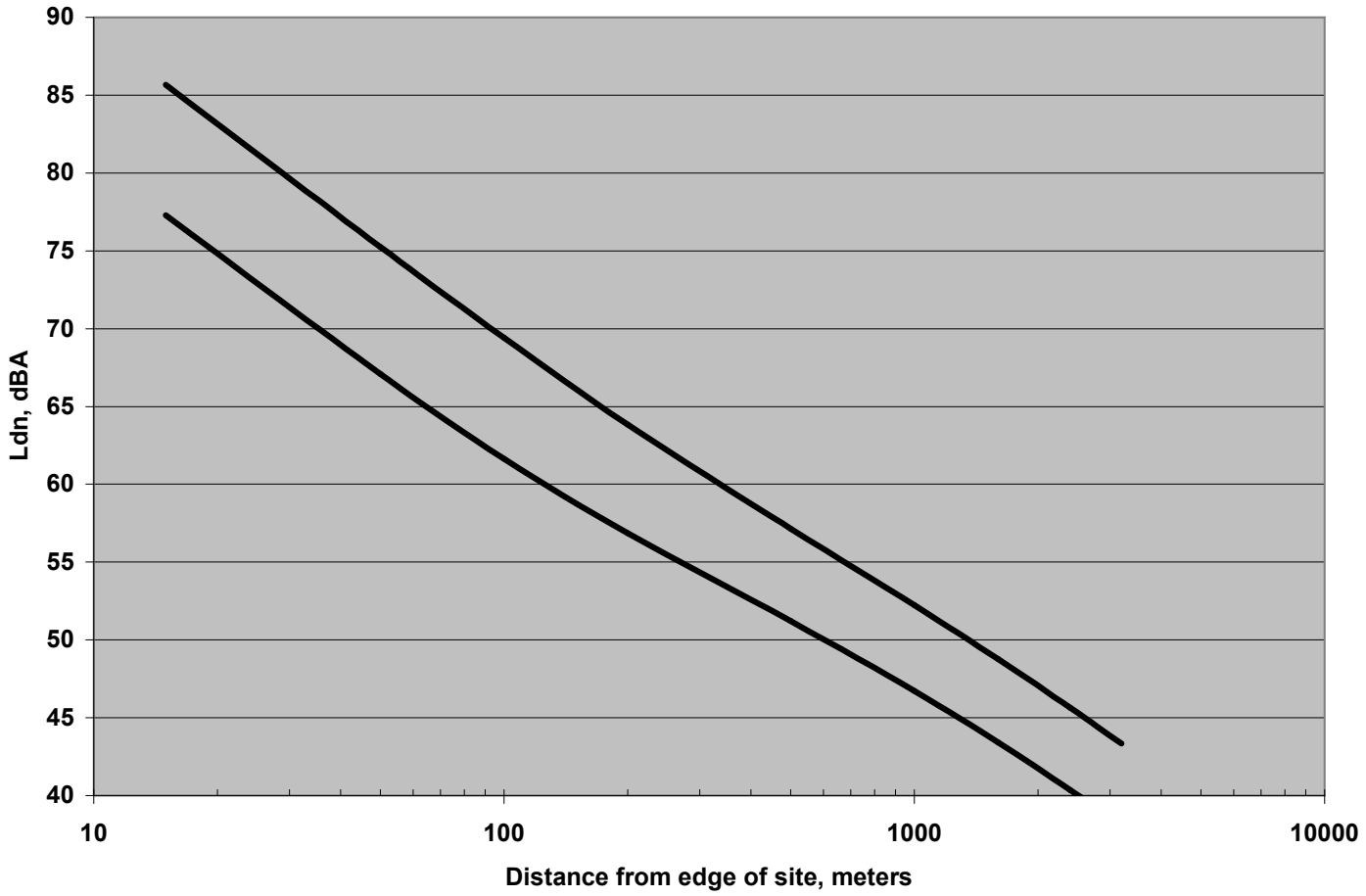

Locus Map

Typical Range of Construction Noise Around Project Site
VV2 Hybrid Power Project

Noise data developed by Acentech, Inc.

Figure not to scale

Inland Energy, Inc.

ENSR | AECOM

Figure: 6.9-2

Date: February 2007

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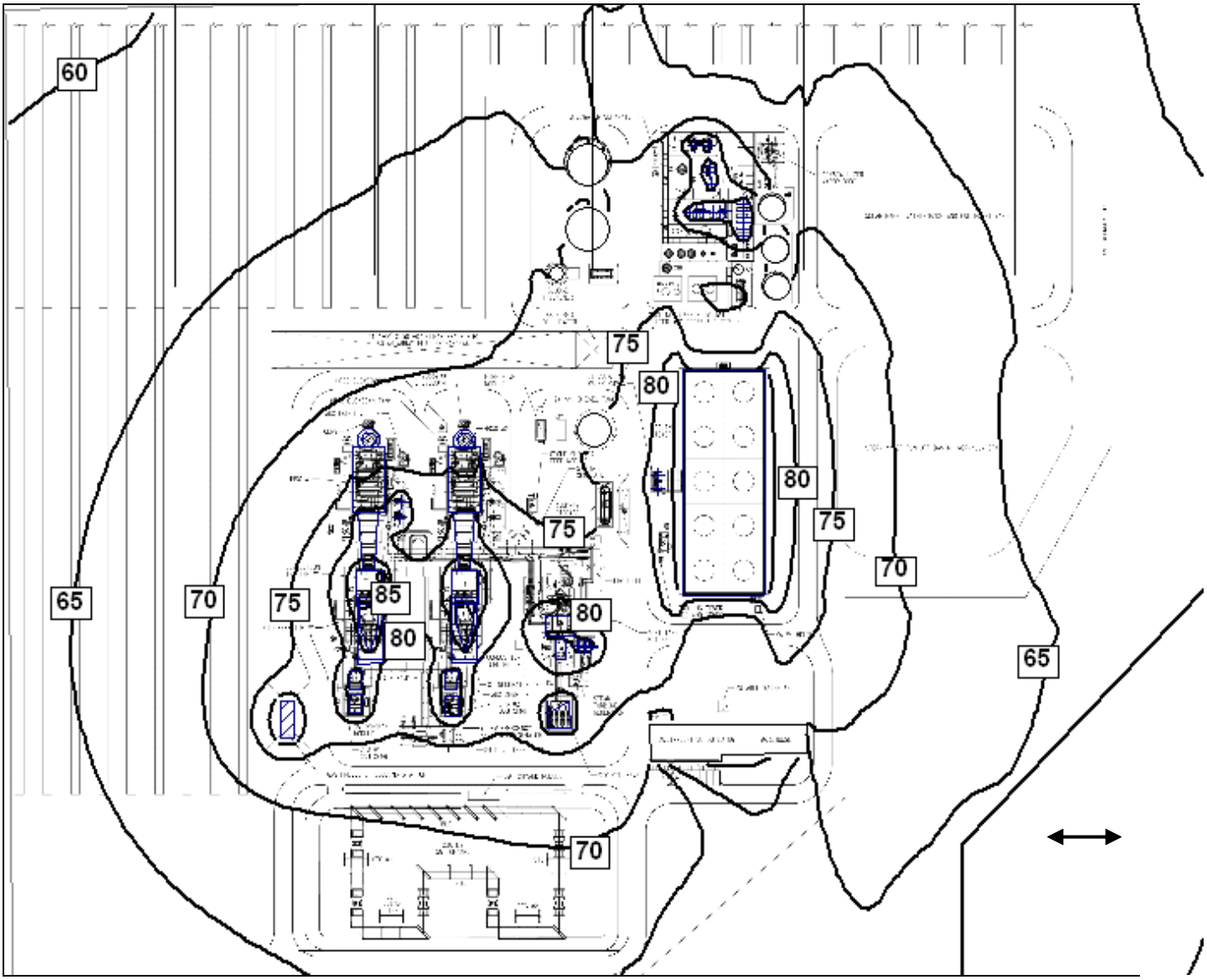

Locus Map

Leq Contours, dBA
VV2 Hybrid Power Project

Noise data developed by Acentech, Inc.

Figure not to scale

Inland Energy, Inc.

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Figure: 6.9-3

Date: February 2007

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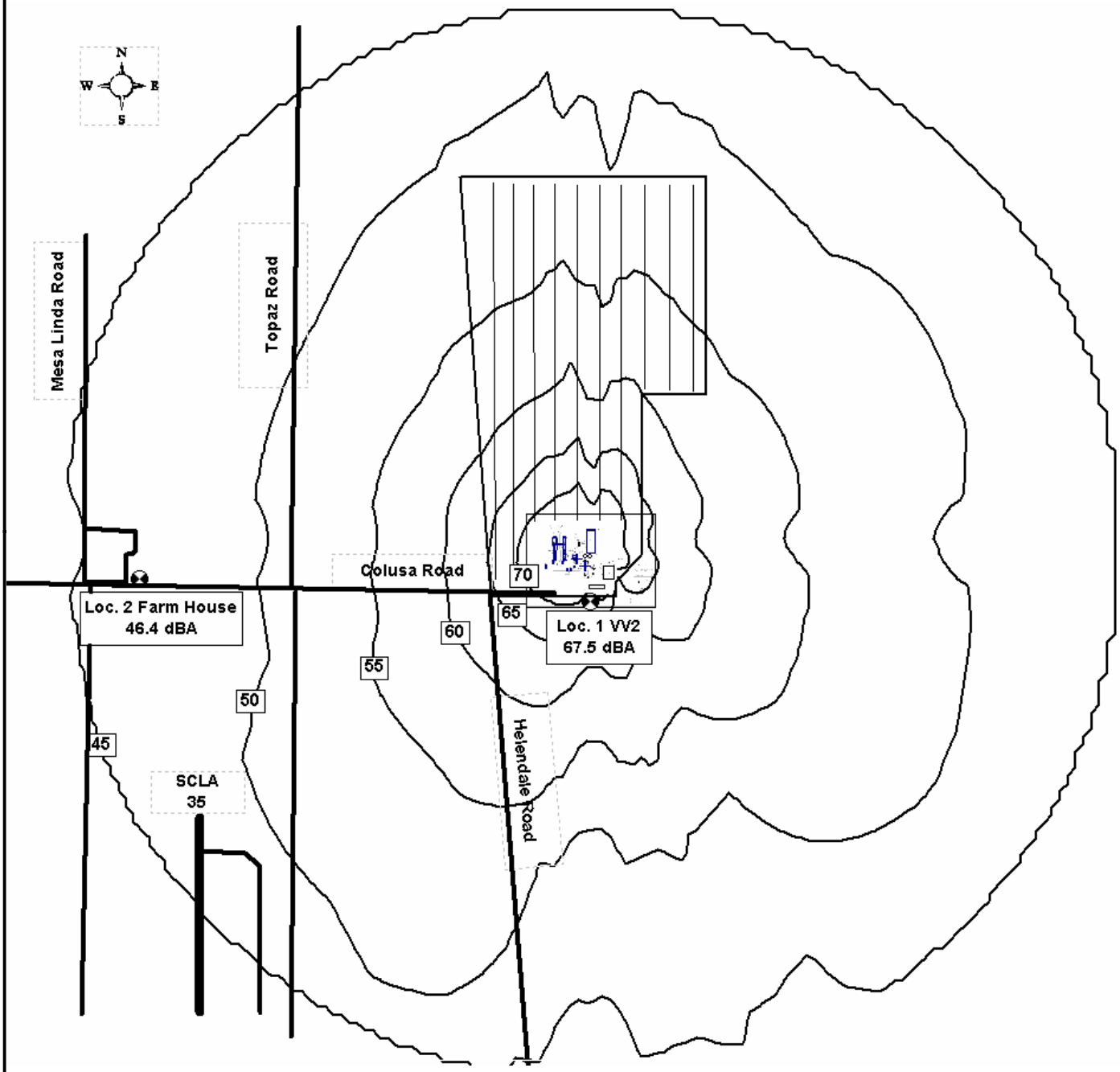

Locus Map

Ldn Contours During Project Operation, dBA
VV2 Hybrid Power Project

Noise data developed by Acentech, Inc.

Figure not to scale

Inland Energy, Inc.

ENSR | AECOM

Figure: 6.9-4

Date: February 2007

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