Noise Technical Report for the Castlerock Project, City of San Diego, California

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1.0 Summary

The proposed Castlerock project is located adjacent to Mast Boulevard between Fanita Drive and West Hills Parkway in the city of San Diego at the border of San Diego and the city of Santee. Because the project site is located adjacent to the city of Santee's western boundary and services could logically be provided by Santee, annexation to the City of Santee is being sought. Annexation is the preferred option ("Annexation Scenario"). The proposed project could be developed in the City of San Diego without annexation to the City of Santee with a few modifications. Therefore, this report also includes a discussion of the project without annexation to the City of Santee ("No Annexation Scenario").

The proposed project would construct 283 detached single-family residences, 147 detached small lot units (referred to as "green court" units), approximately 4.09 acres of public parks, 0.64 acre (0.49 acre usable) of pocket parks, a pedestrian trail, and public streets and private driveways on an undeveloped 203.6-acre site, within the East Elliott Community Plan. The remainder of the property would remain undisturbed as open space, except for small areas needed for brush management.

The No Annexation Scenario would involve slight changes in the land uses with 282 detached single-family residences and 140 detached small lot units.

This report analyzes impacts to the proposed residential lots from future traffic noise generated on Mast Boulevard, as well as from other noise sources in the area. Impacts are assessed in accordance with the guidelines, policies, and standards established by the City of San Diego and the City of Santee. Measures are recommended, as required, to reduce significant impacts to noise-sensitive areas.

1.1 Traffic Noise

Construction of noise barriers ranging from three to four feet high along the southern pad edge as detailed below will result in noise levels for ground-floor exterior usable areas below 65 community noise equivalent level (CNEL) for both the Annexation and the No Annexation Scenarios. With construction of the proposed barriers, ground-floor noise levels at exterior usable areas throughout the project site will be at or below 65 CNEL.

Even with the construction of the proposed barriers, first-, and second-floor exterior noise levels could exceed 60 CNEL for the residential units adjacent to Mast Boulevard for both the Annexation and the No Annexation Scenarios. For the single-family residential units on these pads, the City of San Diego assumes that typical light-frame

construction will provide 15 decibels of noise reduction. If exterior levels are above 60 CNEL, therefore, the interior level may exceed the City of San Diego's 45 CNEL standard.

Thus, at the time that building plans are available for the affected units detailed below, and prior to the issuance of building permits, a detailed acoustical analysis will be required ensuring that interior noise levels due to exterior sources will be below the 45 CNEL standard. The analysis shall consider the first-, and second-floor habitable rooms of the identified residential units along Mast Boulevard.

Additionally, where exterior noise levels are projected to exceed 60 CNEL (residential units along Mast Boulevard), it will be necessary for the windows to be closed in order to achieve the necessary exterior to interior noise reduction. Consequently, the design for these affected units shall include a ventilation or air conditioning system to provide a habitable interior environment when the windows are closed.

1.2 High School

There is a high school stadium adjacent to the project that is located within the city of Santee. Noise from football stadium activities at the high school may result in periodic temporary noise at the proposed residential units. As discussed below, noise impacts would be less than significant and no mitigation is required.

1.3 Construction Noise

Construction shall be limited to the hours of 7:00 A.M. to 7:00 P.M. Monday through Saturday as stated in the City of San Diego and the City of Santee's Noise Abatement and Control Ordinances. In accordance with the noise ordinances, no construction shall take place on Sundays or on legal holidays, as specified in Section 21.04 of the San Diego Municipal Code and Section 8.12.290 of the Santee Municipal Code, with the exception of Columbus Day and George Washington's Birthday.

Compliance with the City of San Diego and the City of Santee's noise ordinances will ensure that construction noise impacts are not significant.

1.4 Sycamore Landfill

Noise levels due to operations at the Sycamore Landfill would not exceed the applicable limits of 62.5 dB(A) L_{eq} during the day, 60.0 dB(A) L_{eq} in the evening, and 57.5 dB(A) L_{eq} during the night at the landfill property boundary. Noise impacts would not be significant.

1.5 Sewer Lift Station

Under the No Annexation Scenario, a new City of San Diego sewer lift station would be required and is proposed to be located at the corner of Street A and the emergency access road. Noise generated by the sewer lift station could result in potential noise impacts to future residents of the proposed project. Implementation of mitigation discussed below would reduce impacts from the sewer lift station to a level below significant for the No Annexation Scenario.

1.6 MCAS Miramar Air Traffic

Marine Corps Air Station (MCAS) Miramar is located approximately seven miles west of the project site. The project site is located well outside the 60 CNEL noise contour line published by the U.S. Marine Corps and the U.S. Department~~s~~ of the ~~Air Force, the Army, and the~~ Navy. Impacts due to air traffic at MCAS Miramar would be less than significant.

2.0 Introduction

The proposed Castlerock project is located adjacent to Mast Boulevard in the city of San Diego at the border of San Diego and the city of Santee. Figure 1 shows the regional location of the project. Figure 2 shows an aerial photograph of the project site. Figure 3 shows the proposed vesting tentative map for the project. The proposed project would construct 283 detached single family residences and 147 single-family detached units clustered on larger lots (referred to as “green court” units). The No Annexation Scenario would involve slight changes in the land uses with 282 detached single-family residences and 140 green court units. For the purposes of this noise analysis, all units were considered to be single-family units. For both scenarios, the lot plan adjacent to Mast Boulevard would be the same.

This report analyzes impacts to the proposed residential units from future traffic noise generated on Mast Boulevard, as well as from other area noise sources. Impacts are assessed in accordance with the guidelines, policies, and standards established by the City of San Diego and the City of Santee. Measures are recommended, as required, to reduce significant impacts to noise-sensitive areas.

The analysis is based on traffic figures projected in the project traffic report (Urban Systems Associates, Inc. 2011).

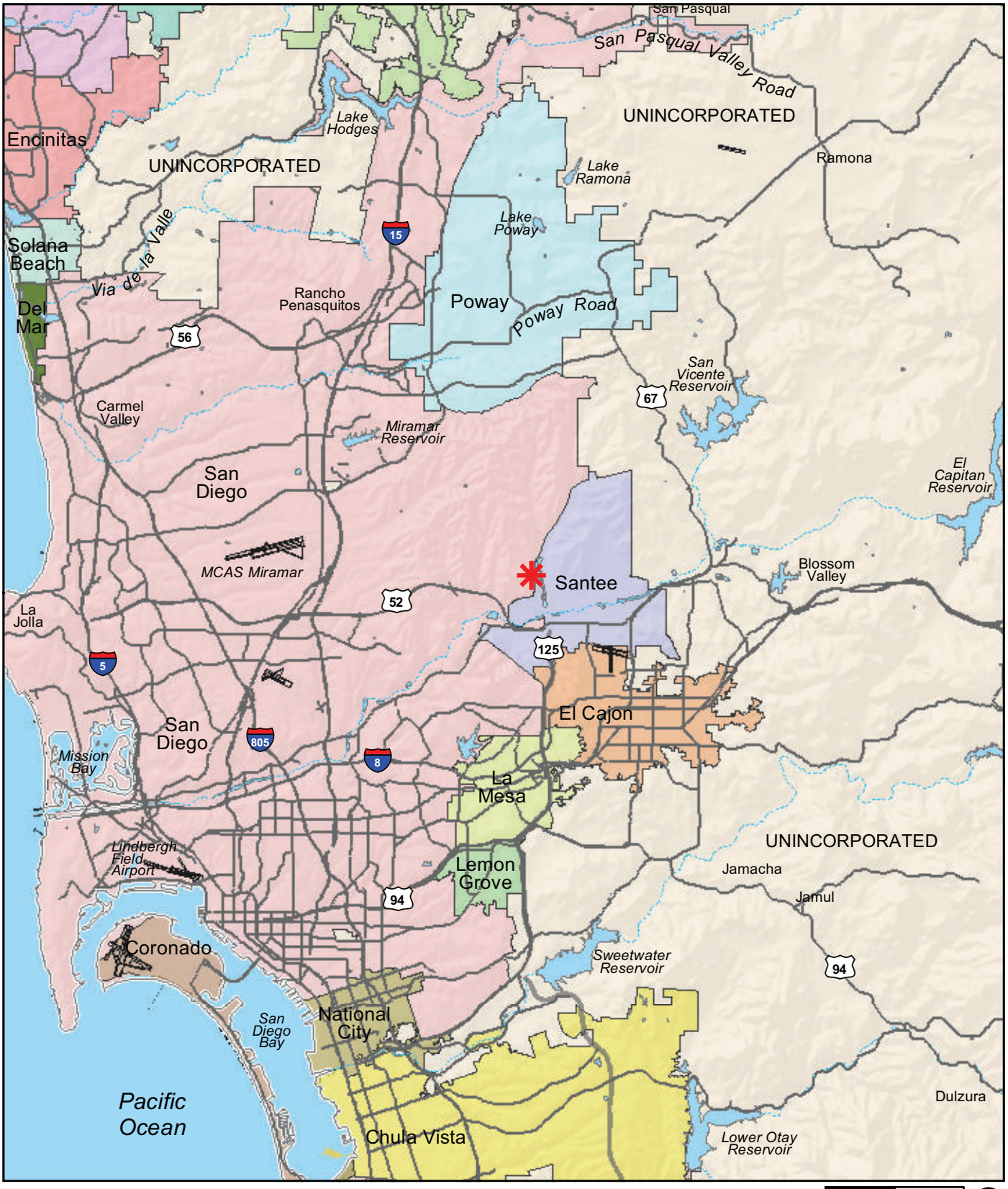

FIGURE 1

Regional Location

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FIGURE 2

Project Location on Aerial Photograph

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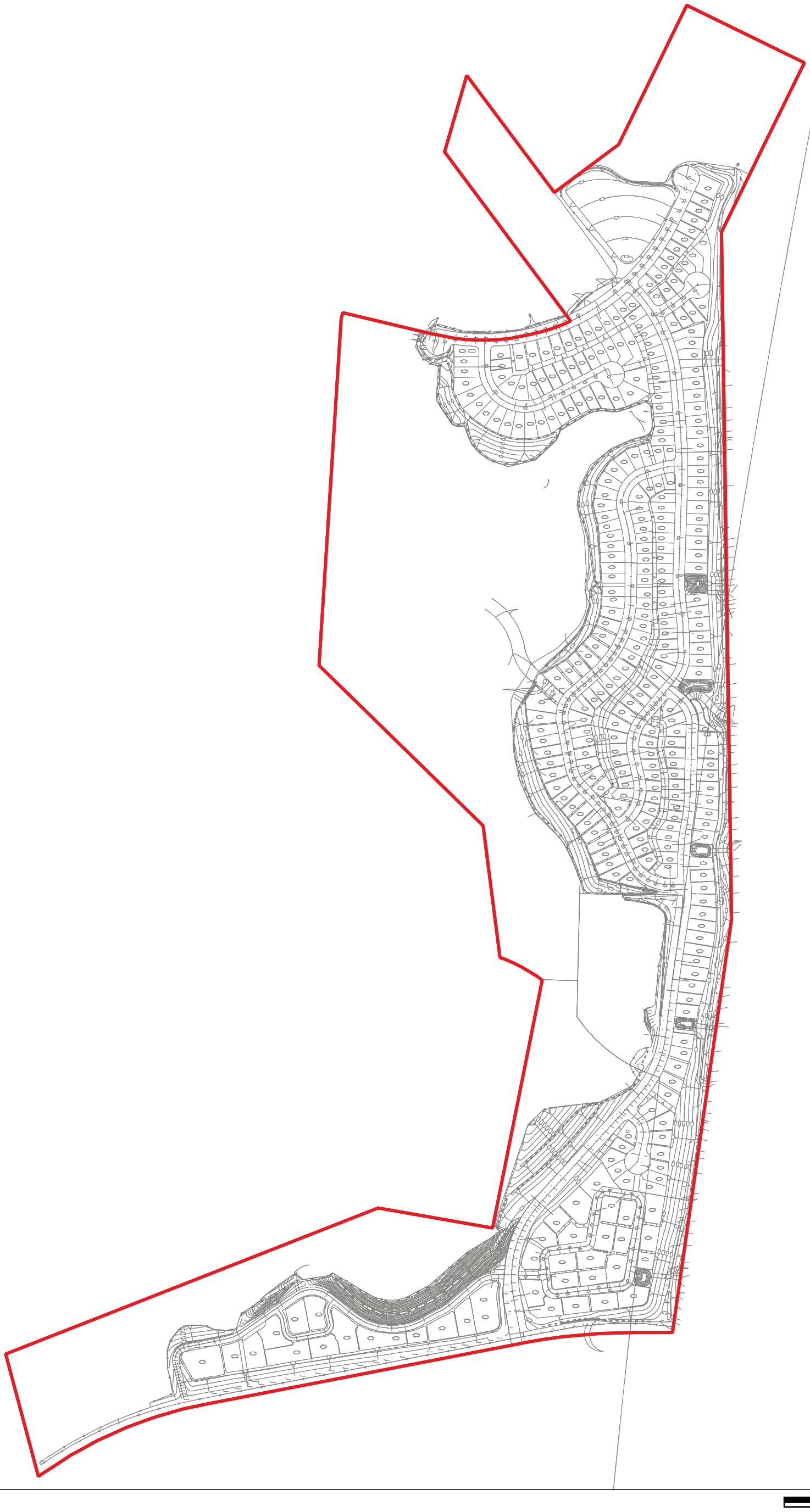

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Project Boundary

Project Plan Lines

FIGURE 3

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Proposed Project Tentative Map

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3.0 Analysis Methodology

3.1 Applicable Standards and Definitions of Terms

The hourly equivalent sound level ($L_{eq(1)}$) is the average A-weighted decibel [dB(A)] sound level over a one-hour period. The CNEL is a 24-hour A-weighted average sound level [dB(A) L_{eq}] from midnight to midnight obtained after the addition of 5 dB to sound levels occurring between 7:00 P.M. and 10:00 P.M. and of 10 dB to the sound levels occurring between 10:00 P.M. and 7:00 A.M. A-weighting is a frequency correction that often correlates well with the subjective response of humans to noise. Adding 5 dB and 10 dB to the evening and nighttime hours, respectively, accounts for the added sensitivity of humans to noise during these time periods.

In general, the noise level standards established by the City of San Diego are more restrictive than those established by the City of Santee. Therefore, for a conservative analysis, impacts to future sensitive receivers under both the Annexation and the No Annexation Scenarios were evaluated in relation to the noise level standards promulgated in the City of San Diego General Plan (2008) and the City Noise Abatement and Control Ordinance. The only exception is the high school stadium located adjacent to the project site. The high school is located within the city of Santee and noise from the stadium is governed by the City of Santee Municipal Code.

City of San Diego. The City of San Diego's exterior noise level standard for single-family residences and neighborhood parks is 65 CNEL, and the City's interior noise level standard for single family residences is 45 CNEL.

The City of San Diego assumes that standard construction techniques will provide a 15-dB reduction of exterior noise levels to an interior receiver. With these criteria, standard construction could be assumed to result in interior noise levels of 45 CNEL or less when exterior sources are 60 CNEL or less. When exterior noise levels are greater than 60 CNEL, consideration of specific construction techniques is required.

The Sycamore Landfill is located directly west of the project site in the city of San Diego. Noise from the landfill is governed by the City of San Diego Municipal Code. The standard for industrial uses is an hourly noise level 75 dB(A) L_{eq} not to be exceeded anytime. The standard for residential uses is 50 dB(A) L_{eq} from 7:00 A.M. to 7:00 P.M., 45 dB(A) L_{eq} from 7:00 P.M. to 10:00 P.M., and 40 dB(A) L_{eq} from 10:00 P.M. to 7:00 A.M. The City's Noise Abatement and Control Ordinance also states that the sound level limit at a location on the boundary between two zoning districts is the arithmetic mean of the respective limits for the two district. Therefore, the noise level limits for the Sycamore Landfill adjacent to the proposed project are 62.5 dB(A) L_{eq} from 7:00 A.M. to 7:00 P.M.,

60 dB(A) L_{eq} from 7:00 P.M. to 10:00 P.M., and 57.5 dB(A) L_{eq} from 10:00 P.M. to 7:00 A.M.

Construction noise is also governed by the City of San Diego Municipal Code. Section 59.5.0404 of the City's Noise Abatement and Control Ordinance states that:

> A. It shall be unlawful for any person, between the hours of 7:00 P.M. of any day and 7:00 A.M. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise . . . .
>
> B. . . . it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 A.M. to 7:00 P.M.

City of Santee. There is a high school stadium adjacent to the project that is located within the city of Santee. Noise from the stadium is governed by the City of Santee Municipal Code. Section 8.12.360 of the Santee Municipal Code exempts "those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events."

In addition, construction noise is governed by the City of Santee Noise Abatement and Control Ordinance (Chapter 8.12 of the Santee Municipal Code). It states that:

> . . . it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Mondays through Saturdays except between the hours of 7:00 A.M. and 7:00 P.M.

No construction is allowed, except under emergency conditions, on Sundays and holidays. Additionally,

> No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of seventy-five decibels for more than eight hours during any twenty-four-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

3.2 Existing Noise Level Measurements

Existing noise levels at the project site were measured using two Larson-Davis Model 720 Type 2 Integrating Sound Level Meters, serial numbers 0264 and 0266. The following parameters were used:

Filter:	A-weighted
Response:	Fast
Time History Period:	5 seconds

The meters were calibrated before the day's measurements. Four ground-floor simultaneous measurements (five feet above the ground) were made for approximately 15 minutes adjacent to Mast Boulevard. During the measurements, traffic was counted on Mast Boulevard.

3.3 Traffic Noise Analysis

3.3.1 Traffic Parameters

Existing traffic volumes on Mast Boulevard are estimated to be 20,905 average daily traffic (ADT) from West Hills Parkway to the high school access and 21,386 ADT from the high school access to Pebble Beach Drive (Urban Systems Associates, Inc. 2011).

Future year 2030 traffic volumes for Mast Boulevard between West Hills Parkway and the high school access and for Mast Boulevard between the high school access to Pebble Beach Drive are projected to be 27,241 and 26,341 ADT, respectively, with buildout of the proposed project (Urban Systems Associates, Inc. 2011). Since the Annexation Scenario would result in eight more residential units and, therefore, slightly greater traffic volumes on area roadways when compared to the No Annexation Scenario, these year 2030 traffic volumes with buildout of the proposed project were used for calculating future traffic noise levels in this analysis.

Mast Boulevard is posted at 35 miles per hour (mph) in the project vicinity. There is a traffic signal at the intersection of Mast Boulevard and Medina Drive. An average traffic speed of 45 mph for Mast Boulevard was found to match traffic following and the noise measurement data well. This speed was used in the analysis of future traffic noise for modeling Mast Boulevard.

The traffic mix data used in the model was predominantly cars. There were no trucks observed during the measurement periods. Nevertheless, to be conservative a typical traffic mix of 97 percent cars, 2 percent medium trucks, and 1 percent heavy trucks was used for projecting future noise levels.

The internal streets and Medina Drive (see Figures 2 and 3) would not carry significant traffic and were not modeled. Also, a row of houses is located between Medina Drive and the project site.

Table 1 summarizes the future traffic parameters used in this analysis.

TABLE 1
YEAR 2030 ROADWAY TRAFFIC PARAMETERS

Roadway	ADT	Percent Autos	Percent Medium Trucks	Percent Heavy Trucks	Speed (mph)
Mast Boulevard (West Hills Pkwy to high school access)	27,241	97	2	1	45
Mast Boulevard (high school access to Pebble Beach Dr.)	26,341	97	2	1	45

The day, evening, and nighttime traffic distribution was assumed to be 77 percent daytime traffic, 10 percent evening traffic, and 13 percent nighttime traffic. With these assumptions, the CNEL is approximately two decibels above the average daytime hourly equivalent noise level.

3.3.2 Analysis of Traffic Noise

Noise generated by future traffic was projected using the Federal Highway Administration Traffic Noise Model (TNM) Version 2.5. The TNM program calculates noise levels at selected receiver locations using input parameter estimates such as projected hourly average traffic rates; vehicle mix, distribution, and speed; roadway lengths and gradients; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures.

Locations and elevations of the project site and adjacent properties and roadways were obtained from computer-aided design files.

Receivers, roadways, and barriers are input into the TNM model using three-dimensional coordinates. The Y-axis pointed north and the X-axis pointed east.

The TNM model allows the user to choose from a number of ground conditions. As seen in the aerial photograph shown in Figure 2, the project site is currently vacant undeveloped land. For this reason, hard soil conditions were assumed in the modeling of noise measurement conditions. Pavement ground conditions were assumed for the analysis of future conditions, since a large portion of the site between the roadways and the structures would be paved. The average annual temperature in the project area is 65 degrees Fahrenheit. The average relative humidity was assumed to be 69 percent

based on the yearly average humidity at Lindbergh Field (Western Regional Climate Center 2010).

Exterior traffic noise levels to first- and second-floor receivers were calculated. Calculations were completed for a daytime hour, and the resulting hourly L_{eq}s were weighted and combined into CNEL values. Projected CNEL values based on the traffic distributions used here are approximately 2 dB higher than the daytime hourly L_{eq} calculated by TNM, as indicated above.

4.0 Existing Conditions

The existing project site is currently undeveloped. There is a substation adjacent to the project that will remain (see Figure 2 and 3). The areas south and east of the project site are developed residential land and a high school, and the areas to the north and west of the project site are undeveloped (see Figure 2). Mast Boulevard lies on the project's southern boundary. A high school exists to the south of the project site. Mast Boulevard is a four-lane prime arterial with a posted speed limit of 35 mph.

Noise measurements were taken on the project site on Wednesday, May 5, 2004 between the hours of 1:01 P.M. and 2:44 P.M. The weather was hot and sunny with a slight breeze. A total of four 15-minute measurements were made on the project site as described below. The primary source of on-site noise was due to traffic on Mast Boulevard. The locations of the measurements are shown on Figure 4 and the noise measurement data are contained in Attachment 1.

Measurement 1 was located near the north end of Medina Drive on the east side of the project area. It was located approximately where future pad edges would be. During the 15-minute measurement period, the average noise level was 40.2 dB(A) at location 1. Traffic was counted on Medina Drive during the measurement interval. Three cars was the total count.

Measurements 2 and 3 were located adjacent to Mast Boulevard. Measurement 2 was 50 feet north of the Mast Boulevard centerline while Measurement 3 was 90 feet north of the Mast Boulevard centerline. These measurements were taken near each other to assist with modeling existing noise conditions at the project site. Noise levels were measured simultaneously at these two locations. Traffic was also counted on Mast Boulevard during the measurement interval. Table 2 summarizes the results of the traffic counts taken during Measurements 2 and 3.

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FIGURE 4

Noise Measurement Locations

TABLE 2
15-MINUTE TRAFFIC COUNTS

	Cars	Medium Trucks	Heavy Trucks	Buses	Motorcycles
Mast Boulevard (westbound)	77	0	0	1	1
Mast Boulevard (eastbound)	117	0	0	0	2

During the 15-minute measurement period, the average noise level was 67.1 dB(A) at location 2 and 64.1 dB(A) at location 3.

Measurement 4 was located adjacent to the north end of the substation. During the 15-minute measurement period, the average noise level was 45.3 dB(A), due to the substation and ambient noise.

The results of the noise measurements are summarized in Table 3.

TABLE 3
COMPARISON OF MEASURED AND MODELED NOISE LEVELS

Measurement	Measured Noise Levels [dB(A) L_{eq}]	Modeled Noise Levels [dB(A) L_{eq}]	Difference
1	40.2	Not modeled	--
2	67.1	66.6	-0.5
3	64.1	63.7	-0.4
4	45.3	Not modeled	--

To determine whether the computer-modeled parameters to be used were reasonable, the TNM model was run for measurement locations 2 and 3 with the observed traffic volumes and mixes for Mast Boulevard indicated in Table 2. The TNM model was not run for measurement locations 1 and 4 because noise levels were not due to traffic volumes on a specific road, but rather ambient background noise.

For this project site, pavement ground conditions were assumed for modeling noise measurement locations 2 and 3 (see Figure 4).

The model output should be close to the same level as the measured value if the model is accurately representing the existing physical conditions. TNM input and output data for modeling the measured conditions are provided in Attachment 2.

The average traffic speed on Mast Boulevard was varied until the TNM output reasonably matched the measured noise levels. As indicated previously, the average

traffic speed for Mast Boulevard that resulted in good agreement with the measurements was 45 mph. This modeled speed also fell within the range of speeds observed by traffic following.

Table 3 shows the measured noise levels compared with the modeled noise levels using these assumptions. From Table 3 it can be seen that the modeled parameters in TNM result in relatively good agreement between the measured and modeled noise levels (within 1 dB). Therefore, the parameters used in TNM for modeling the existing conditions are reasonable.

5.0 Future Acoustical Environment and Impacts

The methods used in the analysis of future conditions are described in the Analysis Methodology section of this report. Traffic parameters used are specified in Table 1 above.

5.1 Traffic Noise Analysis

Noise levels were modeled for a series of receivers located throughout the project area to determine the future noise contours over the project site due to traffic on the area roadways.

TNM input and output are provided in Attachment 3. The resulting noise contours at five feet above the ground are shown in Figure 5. These noise contours include the effects of future grading on the property. The noise contours do not take into account any noise mitigation measures or shielding provided by the proposed buildings. Pavement conditions were used in modeling noise levels at these receivers.

As seen from Figure 5, future traffic noise levels are projected to exceed 65 CNEL at the residences located adjacent to Mast Boulevard.

To refine the model, noise levels were also modeled at 20 locations at the residences adjacent to Mast Boulevard. Pavement conditions were assumed for these receivers. TNM input and output are provided in Attachment 4. Figure 6 shows the locations of these modeled receivers. As stated above, the lot configuration adjacent to Mast Boulevard for both scenarios would be the same.

Table 4 provides the future projected noise levels at these receiver locations. As shown in this table, future noise levels adjacent to Mast Boulevard are projected to exceed 65

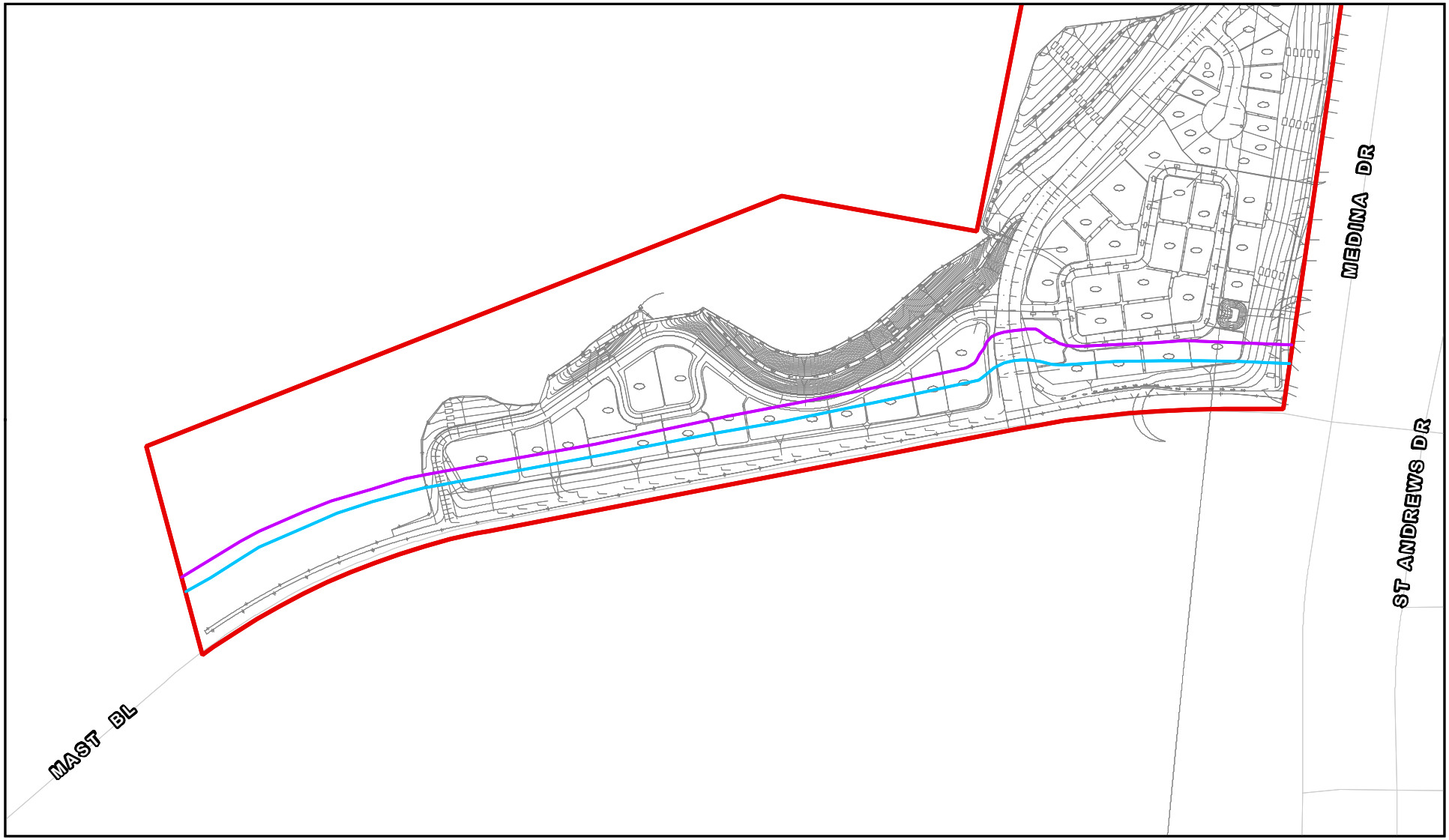

FIGURE 5

Future Projected Noise Contours

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TABLE 4
FUTURE TRAFFIC-GENERATED NOISE LEVELS

Receiver Number	Projected Noise Level with No Constructed Noise Barriers (CNEL)		Projected Noise Level with Constructed Noise Barriers (CNEL)	
	First-Floor	Second-Floor	First-Floor	Second-Floor
1	**68**	67	62	67
2	**68**	68	65	68
3	**68**	68	62	68
4	**68**	68	62	68
5	**69**	68	63	68
6	**69**	69	63	69
7	**69**	69	63	69
8	**69**	69	63	69
9	**70**	70	65	70
10	**70**	70	64	70
11	**70**	70	64	70
12	65	66	64	65
13	61	62	61	61
14	63	64	63	63
15	**69**	69	65	69
16	**70**	70	65	70
17	**69**	69	64	69
18	**69**	68	63	68
19	**68**	67	62	67
20	59	59	59	59

BOLD = exceeds 65 CNEL

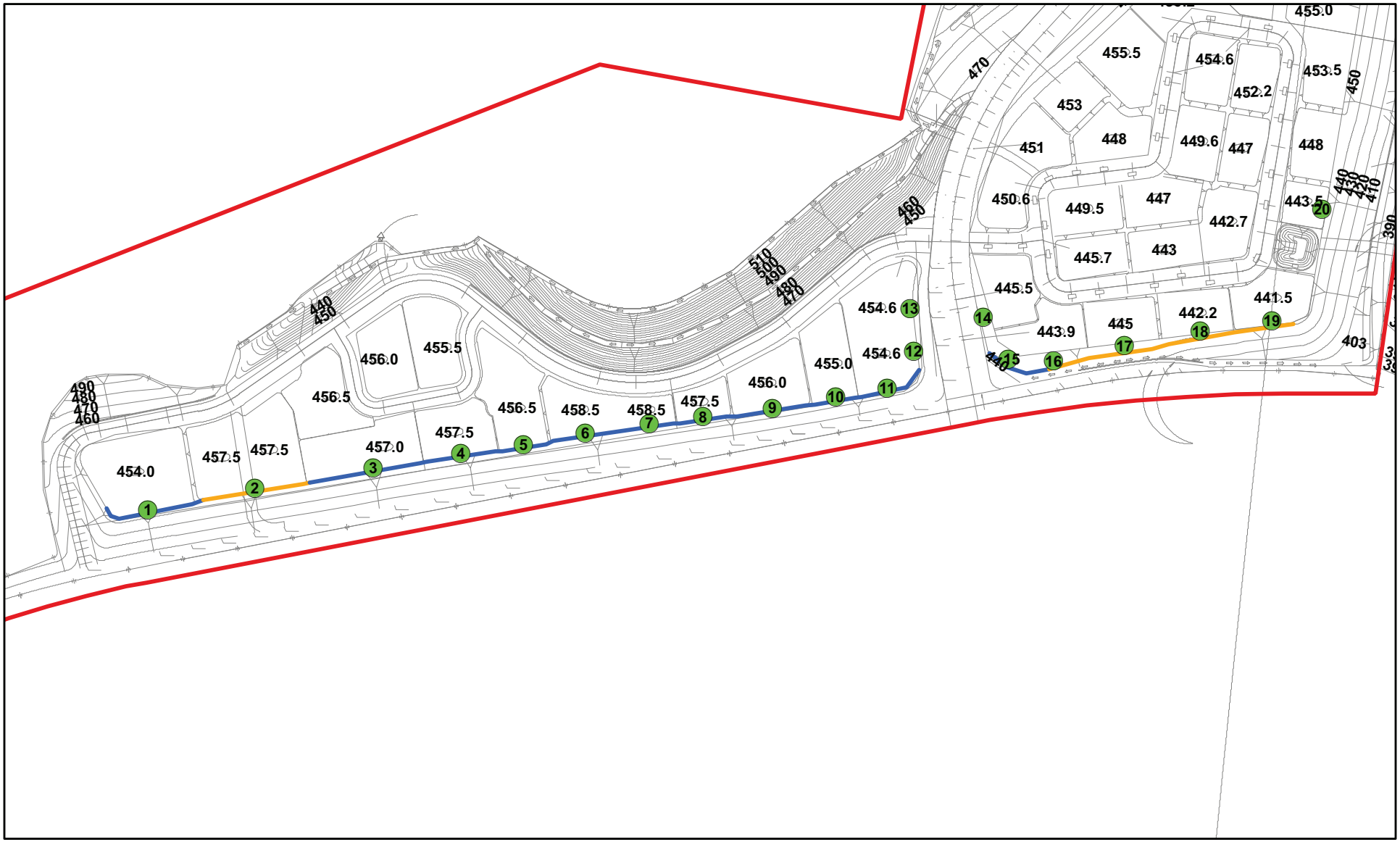

FIGURE 6

Modeled Receiver Locations and Proposed Barriers

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CNEL at the residences located adjacent to Mast Boulevard (Receivers 1 through 11 and 15 through 19) without mitigation.

5.2 High School

Noise from football stadium activities at the high school may result in periodic temporary noise at the proposed residential units. The football stadium is located approximately 640 feet south of the nearest project residence. Loudspeaker noise levels at a typical high school football stadium during a game have been found to generate 77.5 dB(A) at 60 feet from the speakers (RECON 2003). This noise level would reduce to approximately 57 dB(A) at a distance of 640 feet. The periodic noise from the football stadium may be perceived as "nuisance noise" by future residents. The City of Santee Municipal Code exempts noise from the stadium and, therefore, noise resulting from the stadium is not considered a significant impact.

5.3 Construction Noise

Noise associated with the earthwork, construction, and surface preparation of the proposed project will result in short-term, temporary impacts to the existing residences to the east of the project site. A variety of noise-generating equipment would be used during the construction phase of the project such as scrapers, dump trucks, backhoes, front-end loaders, jackhammers, and concrete mixers, along with others.

Table 5 indicates the types of construction equipment typically involved in construction projects. This type of equipment can individually generate noise levels that range between 77 and 91 dB(A) at 50 feet from the source, as listed in Table 5. Ground-clearing activities generally generate the greatest average construction noise levels. These activities are estimated to generate average noise levels of 83 to 84 dB(A) L_{eq} 50 feet from the site of construction (Bolt, Beranek, and Newman, Inc. 1971). This value is based on empirical data on the number and types of equipment at a construction site and their average cycle of operation.

TABLE 5
MEASURED NOISE LEVELS OF
COMMON CONSTRUCTION EQUIPMENT

Equipment	Approximate Noise Level (dBA)
Air compressor	81
Backhoe	85
Concrete Mixer	85
Dozer	80
Generator	78
Grader	85
Jackhammer	88
Loader	79
Paver	89
Pneumatic tool	86
Saw	78
Scraper	88
Truck	91

SOURCE: Bolt, Beranek, and Newman 1971.
NOTE: Noise levels at 50 feet from the source.

Construction noise generally can be treated as a point source and would attenuate at approximately 6 dB(A) for every doubling of distance. A noise level of 84 dB(A) L_{eq} would attenuate to 75 dB(A) L_{eq} at approximately 150 feet from the noise source.

Construction activities, such as grading, which generate the loudest noise levels will occur over the entire site and would not be situated at any one location for a long period of time. Therefore, the acoustic center of the construction activity was assumed to be the center of the project site. As can be seen in Figure 2, existing single-family homes are a minimum of 170 feet to the east of the center of the project site. Therefore, construction noise levels are anticipated to be below City standards.

As discussed above, Section 59.5.0404 of the City of San Diego's Noise Ordinance states that average construction noise levels may not exceed 75 decibels during the 12-hour period from 7:00 A.M. to 7:00 P.M. Furthermore, construction is prohibited between 7:00 P.M. and 7:00 A.M. on Sundays, and on legal holidays, as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday.

In addition, the City of Santee Noise Abatement and Control Ordinance (Chapter 8.12 of the Santee Municipal Code) states that:

> . . . it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site

> on Mondays through Saturdays except between the hours of 7:00 A.M. and 7:00 P.M.

No construction is allowed, except under emergency conditions, on Sundays and holidays. Additionally,

> No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of seventy-five decibels for more than eight hours during any twenty-four-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

5.4 Sycamore Landfill Expansion

The Sycamore Canyon Landfill is located about 1,700 feet west of the project site on the opposite side of a ridgeline. The landfill project proposes the construction of 15-foot-high noise berms at all landfill property boundaries including across the ridgeline that separates the landfill from the Castlerock project site once the height of the landfill reaches 850 feet above mean sea level.

The City of San Diego noise ordinance applicable limits at the landfill boundary are 62.5 dB(A) L_{eq} during the day, 60 dB(A) L_{eq} in the evening, and 57.5 dB(A) L_{eq} during the night. Noise at the Sycamore landfill boundary would not exceed 62.5 dB(A) L_{eq} during the day, 60.0 dB(A) L_{eq} in the evening, and 57.5 dB(A) L_{eq} during the night with the berms in place (Gorden Bricken and Associates 2006). Additionally, these noise levels would attenuate to 31.9 dB(A) L_{eq} during the day, 29.4 dB(A) L_{eq} in the evening, and 26.9 dB(A) L_{eq} during the night at the project site. These noise levels are well below the applicable noise ordinance standards. Additionally, as currently proposed, the Landfill Expansion Master Plan Final EIR sets forth mitigation measures (to be implemented when adjacent residential development occurs), which require that operations at the landfill at night shall be at least 200 feet from the landfill property boundary. Truck hauling would not exceed applicable limits and would be required to stay at least 150 feet from the property boundary during the day, 200 feet from the landfill property boundary in the evening, and 325 feet from the landfill property boundary during the night. Construction of the landfill expansion would occur only in the daytime hours and would not exceed limits. Thus, noise generated by the Sycamore Landfill would not impact future residents of the proposed project.

5.5 Sewer Lift Station

The topography of the Castlerock project site prevents gravity service directly to the City's METRO interceptor. Therefore, under the No Annexation Scenario, a new City of San Diego sewer lift station would be required and is proposed to be located at the corner of Street A and the emergency access road. The pump station would consist of a 28-foot-by-25-foot building of block wall construction housing two 25-horsepower pumps. Noise generated by the sewer lift station could result in noise levels that exceed the City of San Diego's noise ordinance. The Annexation Scenario would not require a sewer lift station.

5.6 MCAS Miramar Air Traffic

MCAS Miramar is located approximately seven miles west of the project site. The air traffic at MCAS Miramar includes rotary (helicopter) and fixed-wing (other military aircraft) traffic. The project site is downwind of the MCAS landing pattern and Field Carrier Landing Practice Flight Corridors for fixed-wing operations. The project site is also located adjacent to the downwind leg of the Field Carrier Landing Practice pattern and directly underneath the Yuma-Sycamore flight corridors for rotary-wing aircraft arriving from and departing to the east. Noise levels due to this air traffic were obtained from the Air Installations Compatible Use Zone document published by the U.S. Marine Corps and U.S. Department of Navy (2005). ~~noise contours published by the U.S. Departments of the Air Force, the Army, and the Navy (1996)~~. The project site is located well outside the 60 CNEL noise contour line. Therefore, impacts due to air traffic at MCAS Miramar are less than significant.

6.0 Mitigation

As discussed above, implementation of the project is anticipated to result in significant noise impacts due to traffic noise from Mast Boulevard. In addition, for the No Annexation Scenario, impacts from the required sewer lift station would also be potentially significant. Compliance with the City of San Diego noise ordinance would reduce potential construction noise impacts to below a level of significance. With implementation of the mitigation measures discussed below, all potential noise impacts would be reduced to less than significant.

6.1 Traffic Noise

As discussed above, exterior noise levels at residences located adjacent to Mast Boulevard were projected to exceed 65 CNEL. Construction of noise barriers ranging from three to four feet high along the southern pad edge as shown in Figure 6 will result in ground floor noise levels at or below 65 CNEL for both the Annexation and the No Annexation Scenarios. Noise barrier heights are relative to the pad elevations as illustrated in Figure 6.

Table 4 shows the resulting noise levels at the modeled receivers after construction of noise barriers. The TNM input and output for modeling the noise barriers are contained in Attachment 4.

The effectiveness of a barrier is dependent upon the quality of construction and the barrier material mass and acoustical properties. Barriers should be free of cracks and holes. The transmission loss through a barrier should be at least 10 decibels greater than the estimated barrier attenuation (Federal Highway Administration 1979:34). If a barrier attenuates noise levels by 5 dB(A) at a receiver location, the barrier transmission loss must be at least 15 dB(A) to prevent audible noise from traveling through the barrier and adding to the acoustical environment. Examples of acceptable barrier materials include, but are not limited to, masonry block, wood frame with stucco, 0.5-inch-thick Plexiglas, or 0.25-inch-thick plate glass. If transparent barrier materials are used, no gaps should occur between the panels.

As seen in Table 4, even with the construction of the proposed barriers, both first- and second-floor exterior noise levels are projected to exceed 60 CNEL for the residential units adjacent to Mast Boulevard for both the Annexation and the No Annexation Scenarios. For single-family residential units on these pads, the City assumes that typical light-frame construction will provide 15 decibels of noise reduction. If exterior levels are above 60 CNEL, therefore, the interior level may exceed the City's 45 CNEL standard.

Thus, at the time that building plans are available for the affected residential units along Mast Boulevard (Figure 7), and prior to the issuance of building permits, a detailed acoustical analysis will be required ensuring that interior noise levels due to exterior sources will be below the 45 CNEL standard. The analysis shall consider the first- and second-floor habitable rooms of the identified units along the southern pad edges adjacent to Mast Boulevard.

Additionally, where exterior noise levels are projected to exceed 60 CNEL (along the southern pad edges adjacent to Mast Boulevard as indicated in Figure 7), it will be necessary for the windows to be closed in order to achieve the necessary exterior to interior noise reduction. Consequently, the design for these affected units shall include

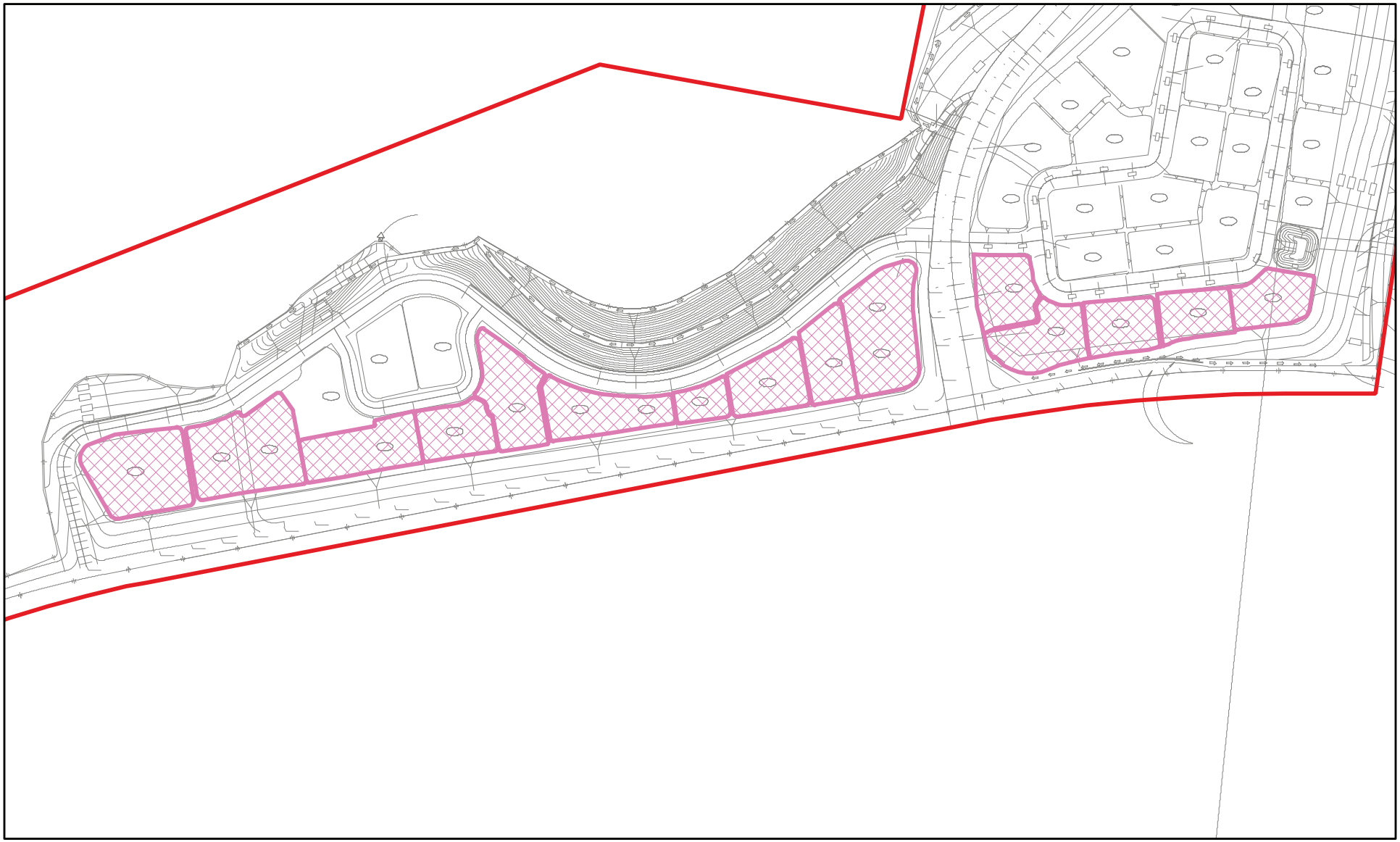

FIGURE 7

Residential Units Exceeding 60 CNEL

RECON

M:\JOBS\3536-2\common_gis\fig7_nos.mxd 11/16/2010

a ventilation or air conditioning system to provide a habitable interior environment when windows are closed.

6.2 Construction Noise

Construction shall be limited to the hours of 7:00 A.M. to 7:00 P.M. Monday through Saturday as stated in the City of San Diego and the City of Santee's Noise Abatement and Control Ordinances. In accordance with the noise ordinances, no construction shall take place on Sundays or on legal holidays, as specified in Section 21.04 of the San Diego Municipal Code and Section 8.12.290 of the Santee Municipal Code, with the exception of Columbus Day and George Washington's Birthday.

Compliance with the City of San Diego and the City of Santee's noise ordinances will ensure that construction noise impacts at the residences to the east are not significant.

6.3 Sewer Lift Station

Prior to the issuance of a building permit for the sewer lift station at the intersection of Street A and the emergency access road, the applicant shall submit building plans to the City Engineer. The lift station shall be designed to be at or below the allowable decibel level at the property line. An acoustical study shall be performed that would confirm engineering and architectural design and materials would reduce noise levels from the lift station to below 40 dB(A) L_{eq} at the property line per San Diego Municipal Code 59.5.0401.

Implementation of this mitigation would reduce impacts from the sewer lift station to a level below significant for the No Annexation Scenario.

7.0 References Cited

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ATTACHMENTS

ATTACHMENT 1

Noise Measurement Data

KEY TO FILE CODES

ATTACHMENT 1

Meter 264	Measurement Location 3 (at five feet high)
Meter 266	Measurement Locations 1, 2, and 4 (at five feet high)

C:\NOISE\LARDAV\SLMUTIL\05MAY_13.bin Interval Data

Site	Location	Meas Number	Date	Time	Duration	Leq	SEL	Lmax	Lmin	Peak	Uwpk
Measurement 3											
0		0	05May 04	13:41:30	29.3	66.4	81.1	71.6	56.7	88.5	97.2
0		0	05May 04	13:42:00	60.0	66.1	83.8	74.3	52.0	82.5	97.2
0		0	05May 04	13:43:00	60.0	63.6	81.3	69.5	50.1	81.3	97.2
0		0	05May 04	13:44:00	60.0	62.7	80.5	68.6	47.0	80.8	97.2
0		0	05May 04	13:45:00	60.0	63.8	81.6	70.1	45.8	83.8	97.2
0		0	05May 04	13:46:00	60.0	64.4	82.1	70.5	44.1	81.4	97.2
0		0	05May 04	13:47:00	60.0	65.8	83.6	71.1	51.9	85.4	0.0
0		0	05May 04	13:48:00	60.0	62.3	80.0	69.8	48.2	81.4	0.0
0		0	05May 04	13:49:00	60.0	63.9	81.7	71.3	51.5	82.0	0.0
0		0	05May 04	13:50:00	60.0	61.2	79.0	69.5	48.6	82.2	0.0
0		0	05May 04	13:51:00	60.0	53.2	71.0	59.9	47.4	71.5	97.2
0		0	05May 04	13:52:00	60.0	68.8	86.5	81.8	51.4	95.9	101.6
0		0	05May 04	13:53:00	60.0	66.6	84.3	75.0	53.9	90.7	97.2
0		0	05May 04	13:54:00	60.0	60.0	77.8	70.1	46.6	81.2	97.2
0		0	05May 04	13:55:00	60.0	63.7	81.5	71.1	49.6	83.2	97.2
0		0	05May 04	13:56:00	60.0	64.4	82.2	70.7	51.4	82.0	97.2
0		0	05May 04	13:57:00	60.0	65.5	83.3	72.2	57.8	86.4	99.7
0		0	05May 04	13:58:00	60.0	64.1	81.9	71.2	52.8	83.6	97.2
0		0	05May 04	13:59:00	60.0	62.5	80.2	70.7	48.4	83.7	97.2
0		0	05May 04	14:00:00	60.0	63.5	81.2	69.7	50.5	81.8	97.2
0		0	05May 04	14:01:00	60.0	58.6	76.4	66.4	49.7	77.7	101.6
0		0	05May 04	14:02:00	60.0	65.4	83.1	73.5	51.3	87.5	101.6
0		0	05May 04	14:03:00	60.0	65.7	83.5	72.3	56.9	83.4	99.7

```
   0                            0   05May 04 14:04:00     35.1  61.1  76.6
69.4  50.5  95.9  97.2
   0                            0   05May 04 15:57:36     23.0  51.7  65.3
66.3  35.8  85.0  99.7
   0                            0   05May 04 15:58:00     36.0  59.0  74.6
81.0  35.8 100.7 109.2
Meas3_interval.doc     9/27/2004   8:00 AM

Meas3_interval.doc     10/15/2004  1:34 PM

Meas3_interval.doc     10/15/2004  2:05 PM
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C:\NOISE\LARDAV\SLMUTIL\05MAY 13.bin Time Historv Data
Sample Period (sec): 5.000

Site	Location	Meas Number	Date	Time	Level	Lmax
Measurement 3						
Run	Kev					
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0		0	05Mav 04	13:41:35	60.0	63.0
0		0	05Mav 04	13:41:40	68.8	71.6
0		0	05Mav 04	13:41:45	68.8	71.2
0		0	05Mav 04	13:41:50	64.6	67.2
0		0	05Mav 04	13:41:55	66.5	68.7
0		0	05Mav 04	13:42:00	64.5	65.6
0		0	05Mav 04	13:42:05	61.1	63.7
0		0	05Mav 04	13:42:10	64.0	66.2
0		0	05Mav 04	13:42:15	58.5	61.5
0		0	05Mav 04	13:42:20	54.7	57.6
0		0	05Mav 04	13:42:25	53.4	55.2
0		0	05Mav 04	13:42:30	56.6	60.4
0		0	05Mav 04	13:42:35	67.6	69.4
0		0	05Mav 04	13:42:40	67.6	71.0
0		0	05Mav 04	13:42:45	67.7	69.6
0		0	05Mav 04	13:42:50	69.3	72.6
0		0	05Mav 04	13:42:55	71.6	74.2
0		0	05Mav 04	13:43:00	66.8	69.3
0		0	05Mav 04	13:43:05	63.9	68.1
0		0	05Mav 04	13:43:10	58.3	60.6
0		0	05Mav 04	13:43:15	65.5	68.8
0		0	05Mav 04	13:43:20	67.7	69.5
0		0	05Mav 04	13:43:25	65.2	69.0
0		0	05Mav 04	13:43:30	64.9	67.9
0		0	05Mav 04	13:43:35	62.0	66.8
0		0	05Mav 04	13:43:40	55.0	57.3
0		0	05Mav 04	13:43:45	53.6	55.0
0		0	05Mav 04	13:43:50	52.4	55.3
0		0	05Mav 04	13:43:55	52.6	56.3
0		0	05Mav 04	13:44:00	62.2	64.8
0		0	05Mav 04	13:44:05	64.4	65.4
0		0	05Mav 04	13:44:10	65.1	67.3
0		0	05Mav 04	13:44:15	60.8	63.6
0		0	05Mav 04	13:44:20	63.5	65.6
0		0	05Mav 04	13:44:25	64.1	65.7
0		0	05Mav 04	13:44:30	59.5	62.4
0		0	05Mav 04	13:44:35	50.7	54.9
0		0	05Mav 04	13:44:40	52.0	60.1
0		0	05Mav 04	13:44:45	58.6	60.6
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0		0	05Mav 04	13:45:05	66.5	69.3
0		0	05Mav 04	13:45:10	68.1	70.1
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0		0	05Mav 04	13:45:20	62.3	63.8
0		0	05Mav 04	13:45:25	63.2	64.8
0		0	05Mav 04	13:45:30	64.3	66.9
0		0	05Mav 04	13:45:35	67.6	68.5
0		0	05Mav 04	13:45:40	63.2	67.1
0		0	05Mav 04	13:45:45	52.4	58.6
0		0	05Mav 04	13:45:50	48.4	49.8
0		0	05Mav 04	13:45:55	47.4	49.4
0		0	05Mav 04	13:46:00	46.3	47.6
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0		0	05Mav 04	13:46:20	68.0	70.5
0		0	05Mav 04	13:46:25	66.5	68.3
0		0	05Mav 04	13:46:30	67.7	68.9
0		0	05Mav 04	13:46:35	67.4	70.4
0		0	05Mav 04	13:46:40	56.5	59.4
0		0	05Mav 04	13:46:45	59.9	63.8
0		0	05Mav 04	13:46:50	66.0	69.6
0		0	05Mav 04	13:46:55	67.3	69.5
0		0	05Mav 04	13:47:00	69.3	70.9
0		0	05Mav 04	13:47:05	67.7	70.1
0		0	05Mav 04	13:47:10	60.6	65.2
0		0	05Mav 04	13:47:15	57.6	65.6
0		0	05Mav 04	13:47:20	67.7	71.1
0		0	05Mav 04	13:47:25	63.1	67.6
0		0	05Mav 04	13:47:30	66.1	68.4
0		0	05Mav 04	13:47:35	66.6	68.8
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0		0	05Mav 04	13:47:50	63.5	66.3
0		0	05Mav 04	13:47:55	64.3	67.3
0		0	05Mav 04	13:48:00	68.7	69.8
0		0	05Mav 04	13:48:05	67.0	69.0
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0		0	05Mav 04	13:48:15	54.8	58.5
0		0	05Mav 04	13:48:20	49.9	51.1
0		0	05Mav 04	13:48:25	49.8	51.0
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0		0	05Mav 04	13:49:05	63.7	67.1
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0		0	05Mav 04	13:49:15	63.2	64.5
0		0	05Mav 04	13:49:20	59.8	62.5
0		0	05Mav 04	13:49:25	56.0	57.3
0		0	05Mav 04	13:49:30	54.5	58.4
0		0	05Mav 04	13:49:35	63.1	65.1
0		0	05Mav 04	13:49:40	61.0	63.5
0		0	05Mav 04	13:49:45	63.0	64.8
0		0	05Mav 04	13:49:50	63.6	64.6
0		0	05Mav 04	13:49:55	65.3	67.6
0		0	05Mav 04	13:50:00	62.9	67.5
0		0	05Mav 04	13:50:05	61.4	63.6
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0		0	05Mav 04	13:50:20	63.7	65.3
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0		0	05Mav 04	13:50:30	59.1	62.0
0		0	05Mav 04	13:50:35	63.1	69.5
0		0	05Mav 04	13:50:40	62.0	67.3
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0		0	05Mav 04	13:50:50	58.6	61.8
0		0	05Mav 04	13:50:55	52.3	56.0
0		0	05Mav 04	13:51:00	50.8	51.9
0		0	05Mav 04	13:51:05	52.1	53.6
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0		0	05Mav 04	13:51:45	51.3	53.3
0		0	05Mav 04	13:51:50	50.8	52.0
0		0	05Mav 04	13:51:55	56.0	59.4
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0		0	05Mav 04	13:52:05	62.1	62.9
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0		0	05Mav 04	13:53:00	62.4	66.5
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0		0	05Mav 04	13:53:15	60.2	63.1
0		0	05Mav 04	13:53:20	71.1	75.0
0		0	05Mav 04	13:53:25	67.0	68.5
0		0	05Mav 04	13:53:30	66.8	69.6
0		0	05Mav 04	13:53:35	64.9	66.8
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0		0	05Mav 04	13:54:55	65.0	68.5
0		0	05Mav 04	13:55:00	68.4	69.8
0		0	05Mav 04	13:55:05	64.9	66.6
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0		0	05Mav 04	13:57:05	62.7	65.3
0		0	05Mav 04	13:57:10	64.2	65.0
0		0	05Mav 04	13:57:15	61.8	63.8
0		0	05Mav 04	13:57:20	64.9	68.8
0		0	05Mav 04	13:57:25	67.3	71.2
0		0	05Mav 04	13:57:30	63.5	66.8
0		0	05Mav 04	13:57:35	66.6	69.2
0		0	05Mav 04	13:57:40	66.9	68.8
0		0	05Mav 04	13:57:45	67.3	70.3
0		0	05Mav 04	13:57:50	67.8	72.2
0		0	05Mav 04	13:57:55	64.5	67.7
0		0	05Mav 04	13:58:00	61.0	63.7
0		0	05Mav 04	13:58:05	68.2	71.1
0		0	05Mav 04	13:58:10	68.4	71.2
0		0	05Mav 04	13:58:15	63.8	66.3
0		0	05Mav 04	13:58:20	56.8	59.2
0		0	05Mav 04	13:58:25	54.5	56.5
0		0	05Mav 04	13:58:30	64.3	67.8
0		0	05Mav 04	13:58:35	60.4	66.2
0		0	05Mav 04	13:58:40	56.0	57.4
0		0	05Mav 04	13:58:45	60.8	63.7
0		0	05Mav 04	13:58:50	65.3	67.5
0		0	05Mav 04	13:58:55	66.2	68.2
0		0	05Mav 04	13:59:00	58.9	62.0
0		0	05Mav 04	13:59:05	51.3	53.8
0		0	05Mav 04	13:59:10	50.7	52.2
0		0	05Mav 04	13:59:15	50.5	52.2
0		0	05Mav 04	13:59:20	53.3	57.8
0		0	05Mav 04	13:59:25	53.6	57.3
0		0	05Mav 04	13:59:30	52.9	54.5
0		0	05Mav 04	13:59:35	53.0	56.0
0		0	05Mav 04	13:59:40	62.9	67.9
0		0	05Mav 04	13:59:45	66.6	70.3
0		0	05Mav 04	13:59:50	68.2	69.5
0		0	05Mav 04	13:59:55	67.7	70.7
0		0	05Mav 04	14:00:00	63.8	66.0
0		0	05Mav 04	14:00:05	58.3	62.8
0		0	05Mav 04	14:00:10	54.1	55.8
0		0	05Mav 04	14:00:15	53.0	57.5
0		0	05Mav 04	14:00:20	51.9	54.0
0		0	05Mav 04	14:00:25	54.4	57.3
0		0	05Mav 04	14:00:30	65.1	68.3
0		0	05Mav 04	14:00:35	66.4	69.7
0		0	05Mav 04	14:00:40	68.2	69.3
0		0	05Mav 04	14:00:45	65.4	66.8
0		0	05Mav 04	14:00:50	65.4	68.0
0		0	05Mav 04	14:00:55	60.2	63.0
0		0	05Mav 04	14:01:00	60.2	61.4
0		0	05Mav 04	14:01:05	62.8	66.4
0		0	05Mav 04	14:01:10	63.6	65.8
0		0	05Mav 04	14:01:15	56.7	61.0
0		0	05Mav 04	14:01:20	58.3	64.4
0		0	05Mav 04	14:01:25	59.5	62.5
0		0	05Mav 04	14:01:30	55.8	57.0
0		0	05Mav 04	14:01:35	53.9	56.9
0		0	05Mav 04	14:01:40	53.1	56.8
0		0	05Mav 04	14:01:45	53.0	56.6
0		0	05Mav 04	14:01:50	51.6	53.4
0		0	05Mav 04	14:01:55	52.1	54.1
0		0	05Mav 04	14:02:00	54.6	58.4
0		0	05Mav 04	14:02:05	62.0	65.3
0		0	05Mav 04	14:02:10	67.9	70.4
0		0	05Mav 04	14:02:15	70.4	73.5
0		0	05Mav 04	14:02:20	65.5	70.4
0		0	05Mav 04	14:02:25	67.8	69.3
0		0	05Mav 04	14:02:30	66.0	67.9
0		0	05Mav 04	14:02:35	66.4	68.3
0		0	05Mav 04	14:02:40	60.3	65.3
0		0	05Mav 04	14:02:45	62.8	66.5
0		0	05Mav 04	14:02:50	58.2	59.5
0		0	05Mav 04	14:02:55	57.6	58.9

```
   0                         0   05May 04 14:03:00  63.2  67.4
   0                         0   05May 04 14:03:05  65.5  66.6
   0                         0   05May 04 14:03:10  66.2  67.5
   0                         0   05May 04 14:03:15  65.4  66.8
   0                         0   05May 04 14:03:20  60.0  63.1
   0                         0   05May 04 14:03:25  61.2  63.5
   0                         0   05May 04 14:03:30  63.9  65.8
   0                         0   05May 04 14:03:35  70.0  72.3
   0                         0   05May 04 14:03:40  69.8  71.6
   0                         0   05May 04 14:03:45  64.8  67.4
   0                         0   05May 04 14:03:50  64.4  66.6
   0                         0   05May 04 14:03:55  61.1  64.4
   0                         0   05May 04 14:04:00  63.6  66.4
   0                         0   05May 04 14:04:05  63.3  65.2
   0                         0   05May 04 14:04:10  62.7  64.9
   0                         0   05May 04 14:04:15  55.6  58.5
   0                         0   05May 04 14:04:20  59.7  69.4
   0                         0   05May 04 14:04:25  59.7  64.3
   0                         0   05May 04 14:04:30  55.5  58.3
Stop   Kev
Run    Kev
```

C:\NOISE\LARDAV\SLMUTIL\05MAY_13.bin Interval Data

Site	Location	Meas Number	Date	Time	Duration	Leq	SEL	Lmax	Lmin	Peak	Uwpk
Measurement 1											
0		0	05May 04	13:01:10	49.9	42.0	59.0	53.3	36.6	78.0	0.0
0		0	05May 04	13:02:00	60.0	38.3	56.1	45.1	36.1	56.1	0.0
0		0	05May 04	13:03:00	60.0	41.5	59.3	48.3	37.0	58.9	0.0
0		0	05May 04	13:04:00	60.0	40.1	57.9	48.7	35.6	60.3	0.0
0		0	05May 04	13:05:00	60.0	39.8	57.5	44.2	37.6	57.0	0.0
0		0	05May 04	13:06:00	60.0	43.9	61.7	50.3	38.0	67.1	0.0
0		0	05May 04	13:07:00	60.0	38.0	55.7	42.2	36.5	54.0	0.0
0		0	05May 04	13:08:00	60.0	42.4	60.2	51.1	37.0	62.4	0.0
0		0	05May 04	13:09:00	60.0	38.6	56.3	45.7	36.2	60.5	0.0
0		0	05May 04	13:10:00	60.0	36.3	54.1	38.7	35.0	53.9	0.0
0		0	05May 04	13:11:00	60.0	36.8	54.6	45.5	34.9	62.5	0.0
0		0	05May 04	13:12:00	60.0	39.4	57.2	43.9	36.5	56.0	0.0
0		0	05May 04	13:13:00	60.0	41.4	59.2	47.1	37.8	58.7	0.0
0		0	05May 04	13:14:00	60.0	38.7	56.4	42.4	35.7	58.7	0.0
0		0	05May 04	13:15:00	60.0	39.0	56.7	50.3	35.7	65.1	0.0
0		0	05May 04	13:16:00	40.1	41.2	57.2	49.9	37.1	72.1	0.0
Measurement 2											
0		0	05May 04	13:43:05	54.5	65.8	83.1	74.2	47.1	86.6	0.0
0		0	05May 04	13:44:00	60.0	65.0	82.8	75.4	44.6	87.7	98.5
0		0	05May 04	13:45:00	60.0	66.5	84.3	73.6	44.3	86.3	0.0
0		0	05May 04	13:46:00	60.0	67.5	85.3	74.8	43.0	87.1	0.0
0		0	05May 04	13:47:00	60.0	68.9	86.7	75.0	49.1	88.6	0.0
0		0	05May 04	13:48:00	60.0	63.8	81.5	70.8	46.8	83.7	0.0
0		0	05May 04	13:49:00	60.0	67.0	84.8	77.2	49.3	90.5	98.5
0		0	05May 04	13:50:00	60.0	64.5	82.3	75.0	48.6	86.7	0.0
0		0	05May 04	13:51:00	60.0	52.7	70.5	61.3	45.3	73.5	0.0
0		0	05May 04	13:52:00	60.0	72.7	90.5	88.5	47.5	101.6	108.9
0		0	05May 04	13:53:00	60.0	69.9	87.7	81.3	49.8	102.5	102.9
0		0	05May 04	13:54:00	60.0	63.3	81.1	75.2	46.0	86.3	0.0
0		0	05May 04	13:55:00	60.0	66.3	84.0	76.8	47.8	88.5	101.0
0		0	05May 04	13:56:00	60.0	68.0	85.7	76.3	50.5	87.7	0.0
0		0	05May 04	13:57:00	60.0	67.0	84.7	73.5	57.8	86.6	101.0
0		0	05May 04	13:58:00	60.0	67.0	84.8	76.2	49.9	88.8	0.0
0		0	05May 04	13:59:00	60.0	64.8	82.6	75.3	47.8	87.2	98.5
0		0	05May 04	14:00:00	60.0	66.8	84.6	74.8	48.4	88.2	0.0
0		0	05May 04	14:01:00	60.0	59.9	77.6	67.8	48.4	80.5	101.0
0		0	05May 04	14:02:00	60.0	69.5	87.3	81.8	50.5	92.6	101.0
0		0	05May 04	14:03:00	60.0	67.2	85.0	75.6	53.3	86.9	98.5
0		0	05May 04	14:04:00	55.7	62.6	80.0	72.6	47.7	84.6	98.5
Measurement 4											
0		0	05May 04	14:29:00	59.9	45.2	63.0	52.5	41.8	75.9	0.0
0		0	05May 04	14:30:00	60.0	46.2	64.0	50.8	42.5	68.8	0.0
0		0	05May 04	14:31:00	60.0	46.5	64.3	52.2	42.9	63.9	0.0
0		0	05May 04	14:32:00	60.0	44.5	62.3	53.3	41.2	78.6	0.0
0		0	05May 04	14:33:00	60.0	48.0	65.8	55.4	41.9	74.8	0.0
0		0	05May 04	14:34:00	60.0	47.5	65.3	54.3	41.4	66.5	0.0
0		0	05May 04	14:35:00	60.0	46.5	64.3	53.2	42.5	64.5	0.0
0		0	05May 04	14:36:00	60.0	46.3	64.0	57.0	41.0	83.8	0.0
0		0	05May 04	14:37:00	60.0	43.4	61.2	53.3	40.7	70.2	0.0
0		0	05May 04	14:38:00	60.0	43.6	61.4	50.7	40.5	69.8	0.0
0		0	05May 04	14:39:00	60.0	44.0	61.8	50.6	40.0	64.1	0.0
0		0	05May 04	14:40:00	60.0	42.6	60.3	47.4	40.3	61.5	0.0
0		0	05May 04	14:41:00	60.0	41.8	59.6	46.3	40.2	66.7	0.0
0		0	05May 04	14:42:00	60.0	44.9	62.6	49.9	40.8	70.1	0.0
0		0	05May 04	14:43:00	60.0	43.8	61.6	51.3	40.5	73.2	0.0
0		0	05May 04	14:44:00	0.3	45.0	40.3	46.8	42.0	68.7	0.0
0		0	05May 04	15:54:20	31.5	47.9	62.9	65.4	38.4	83.8	0.0

C:\NOISE\LARDAV\SLMUTIL\05MAY 13.bin Time Historv Data
Sample Period (sec): 5.000

Site	Location	Meas Number	Date	Time	Level	Lmax
Run	Kev					
Measurement 1						
0		0	05Mav 04	13:01:10	44.3	49.5
0		0	05Mav 04	13:01:15	46.3	50.8
0		0	05Mav 04	13:01:20	38.7	41.7
0		0	05Mav 04	13:01:25	39.2	42.1
0		0	05Mav 04	13:01:30	38.4	40.2
0		0	05Mav 04	13:01:35	39.2	42.8
0		0	05Mav 04	13:01:40	46.0	53.3
0		0	05Mav 04	13:01:45	38.1	40.8
0		0	05Mav 04	13:01:50	38.0	40.5
0		0	05Mav 04	13:01:55	37.4	39.0
0		0	05Mav 04	13:02:00	37.8	39.0
0		0	05Mav 04	13:02:05	37.2	38.1
0		0	05Mav 04	13:02:10	37.4	39.4
0		0	05Mav 04	13:02:15	38.4	40.2
0		0	05Mav 04	13:02:20	37.1	38.6
0		0	05Mav 04	13:02:25	36.9	38.1
0		0	05Mav 04	13:02:30	38.0	39.6
0		0	05Mav 04	13:02:35	37.0	38.0
0		0	05Mav 04	13:02:40	39.0	42.6
0		0	05Mav 04	13:02:45	38.8	40.0
0		0	05Mav 04	13:02:50	38.4	40.9
0		0	05Mav 04	13:02:55	41.2	45.1
0		0	05Mav 04	13:03:00	42.1	45.3
0		0	05Mav 04	13:03:05	40.2	43.4
0		0	05Mav 04	13:03:10	40.8	43.3
0		0	05Mav 04	13:03:15	40.8	44.0
0		0	05Mav 04	13:03:20	44.3	48.3
0		0	05Mav 04	13:03:25	42.7	46.8
0		0	05Mav 04	13:03:30	42.3	46.9
0		0	05Mav 04	13:03:35	42.9	47.8
0		0	05Mav 04	13:03:40	39.7	42.3
0		0	05Mav 04	13:03:45	39.5	40.9
0		0	05Mav 04	13:03:50	39.9	42.7
0		0	05Mav 04	13:03:55	38.7	40.7
0		0	05Mav 04	13:04:00	37.4	39.2
0		0	05Mav 04	13:04:05	37.6	38.8
0		0	05Mav 04	13:04:10	37.4	39.6
0		0	05Mav 04	13:04:15	37.2	39.3
0		0	05Mav 04	13:04:20	36.2	36.8
0		0	05Mav 04	13:04:25	38.0	39.1
0		0	05Mav 04	13:04:30	38.7	39.6
0		0	05Mav 04	13:04:35	39.9	43.3
0		0	05Mav 04	13:04:40	41.1	46.0
0		0	05Mav 04	13:04:45	45.4	48.7
0		0	05Mav 04	13:04:50	42.0	44.5
0		0	05Mav 04	13:04:55	39.1	40.5
0		0	05Mav 04	13:05:00	38.9	40.3
0		0	05Mav 04	13:05:05	39.7	41.5
0		0	05Mav 04	13:05:10	39.1	40.1
0		0	05Mav 04	13:05:15	40.2	41.6
0		0	05Mav 04	13:05:20	39.9	41.2
0		0	05Mav 04	13:05:25	39.7	40.7
0		0	05Mav 04	13:05:30	38.8	40.5
0		0	05Mav 04	13:05:35	39.4	41.5
0		0	05Mav 04	13:05:40	39.9	41.7
0		0	05Mav 04	13:05:45	39.9	42.4
0		0	05Mav 04	13:05:50	40.5	43.7
0		0	05Mav 04	13:05:55	40.6	44.2
0		0	05Mav 04	13:06:00	41.5	44.7
0		0	05Mav 04	13:06:05	41.2	43.6
0		0	05Mav 04	13:06:10	42.7	46.7
0		0	05Mav 04	13:06:15	41.7	43.4
0		0	05Mav 04	13:06:20	44.8	47.4
0		0	05Mav 04	13:06:25	47.2	49.5
0		0	05Mav 04	13:06:30	42.8	46.6
0		0	05Mav 04	13:06:35	42.2	45.9
0		0	05Mav 04	13:06:40	39.8	41.6
0		0	05Mav 04	13:06:45	45.6	48.1
0		0	05Mav 04	13:06:50	47.5	50.3
0		0	05Mav 04	13:06:55	41.2	43.9
0		0	05Mav 04	13:07:00	39.1	40.3
0		0	05Mav 04	13:07:05	37.9	38.8
0		0	05Mav 04	13:07:10	39.3	42.2
0		0	05Mav 04	13:07:15	37.7	39.0
0		0	05Mav 04	13:07:20	37.9	39.7
0		0	05Mav 04	13:07:25	38.2	39.4
0		0	05Mav 04	13:07:30	37.5	39.1
0		0	05Mav 04	13:07:35	37.0	38.0
0		0	05Mav 04	13:07:40	37.1	38.3
0		0	05Mav 04	13:07:45	37.1	37.8
0		0	05Mav 04	13:07:50	37.7	38.7
0		0	05Mav 04	13:07:55	38.1	39.5
0		0	05Mav 04	13:08:00	40.2	44.1
0		0	05Mav 04	13:08:05	38.8	40.0
0		0	05Mav 04	13:08:10	39.8	43.2
0		0	05Mav 04	13:08:15	45.3	49.4
0		0	05Mav 04	13:08:20	45.7	51.1
0		0	05Mav 04	13:08:25	43.5	45.2
0		0	05Mav 04	13:08:30	42.2	44.7
0		0	05Mav 04	13:08:35	41.0	43.4
0		0	05Mav 04	13:08:40	40.4	42.3
0		0	05Mav 04	13:08:45	43.0	46.9
0		0	05Mav 04	13:08:50	41.1	44.2
0		0	05Mav 04	13:08:55	41.4	44.2
0		0	05Mav 04	13:09:00	41.4	44.0
0		0	05Mav 04	13:09:05	38.7	40.8
0		0	05Mav 04	13:09:10	39.0	41.5
0		0	05Mav 04	13:09:15	38.0	39.2
0		0	05Mav 04	13:09:20	38.6	40.3
0		0	05Mav 04	13:09:25	37.3	38.1
0		0	05Mav 04	13:09:30	37.7	39.2
0		0	05Mav 04	13:09:35	37.8	38.7
0		0	05Mav 04	13:09:40	38.3	40.5
0		0	05Mav 04	13:09:45	38.7	45.7
0		0	05Mav 04	13:09:50	37.5	40.7
0		0	05Mav 04	13:09:55	37.8	40.3
0		0	05Mav 04	13:10:00	37.0	37.6
0		0	05Mav 04	13:10:05	37.4	38.5
0		0	05Mav 04	13:10:10	37.2	38.7
0		0	05Mav 04	13:10:15	36.8	37.9
0		0	05Mav 04	13:10:20	36.2	36.9
0		0	05Mav 04	13:10:25	36.2	37.0
0		0	05Mav 04	13:10:30	35.8	36.2
0		0	05Mav 04	13:10:35	35.8	36.4
0		0	05Mav 04	13:10:40	36.1	38.7
0		0	05Mav 04	13:10:45	35.4	35.9
0		0	05Mav 04	13:10:50	35.5	36.0
0		0	05Mav 04	13:10:55	35.9	37.0
0		0	05Mav 04	13:11:00	37.5	38.7
0		0	05Mav 04	13:11:05	36.0	37.2
0		0	05Mav 04	13:11:10	37.3	42.6
0		0	05Mav 04	13:11:15	36.8	37.7
0		0	05Mav 04	13:11:20	36.7	38.0
0		0	05Mav 04	13:11:25	36.1	37.1
0		0	05Mav 04	13:11:30	35.5	36.0
0		0	05Mav 04	13:11:35	35.8	36.5
0		0	05Mav 04	13:11:40	36.2	36.8
0		0	05Mav 04	13:11:45	36.4	37.6
0		0	05Mav 04	13:11:50	38.7	45.5
0		0	05Mav 04	13:11:55	37.1	38.3
0		0	05Mav 04	13:12:00	38.8	40.8
0		0	05Mav 04	13:12:05	38.5	41.6
0		0	05Mav 04	13:12:10	39.0	41.2
0		0	05Mav 04	13:12:15	38.7	40.0
0		0	05Mav 04	13:12:20	38.7	41.4
0		0	05Mav 04	13:12:25	37.9	39.4
0		0	05Mav 04	13:12:30	38.2	39.1
0		0	05Mav 04	13:12:35	37.3	38.5
0		0	05Mav 04	13:12:40	40.2	41.8
0		0	05Mav 04	13:12:45	40.8	43.9
0		0	05Mav 04	13:12:50	41.0	43.7
0		0	05Mav 04	13:12:55	41.3	42.8
0		0	05Mav 04	13:13:00	40.3	42.5
0		0	05Mav 04	13:13:05	39.9	42.9
0		0	05Mav 04	13:13:10	39.7	41.5
0		0	05Mav 04	13:13:15	43.5	46.0
0		0	05Mav 04	13:13:20	41.6	44.2
0		0	05Mav 04	13:13:25	41.0	44.9
0		0	05Mav 04	13:13:30	42.0	47.1
0		0	05Mav 04	13:13:35	40.6	43.5
0		0	05Mav 04	13:13:40	42.5	44.5
0		0	05Mav 04	13:13:45	41.6	45.3
0		0	05Mav 04	13:13:50	42.4	44.3
0		0	05Mav 04	13:13:55	39.7	41.5
0		0	05Mav 04	13:14:00	39.4	40.7
0		0	05Mav 04	13:14:05	40.3	42.0
0		0	05Mav 04	13:14:10	40.2	42.4
0		0	05Mav 04	13:14:15	39.0	40.8
0		0	05Mav 04	13:14:20	39.4	41.3
0		0	05Mav 04	13:14:25	38.9	42.2
0		0	05Mav 04	13:14:30	39.0	41.6
0		0	05Mav 04	13:14:35	37.3	38.1
0		0	05Mav 04	13:14:40	37.2	38.2
0		0	05Mav 04	13:14:45	37.1	38.7
0		0	05Mav 04	13:14:50	36.4	38.4
0		0	05Mav 04	13:14:55	37.1	38.2
0		0	05Mav 04	13:15:00	36.8	37.6
0		0	05Mav 04	13:15:05	36.7	37.2
0		0	05Mav 04	13:15:10	37.2	39.0
0		0	05Mav 04	13:15:15	36.6	37.2
0		0	05Mav 04	13:15:20	36.5	37.1
0		0	05Mav 04	13:15:25	36.0	36.4
0		0	05Mav 04	13:15:30	36.7	37.7
0		0	05Mav 04	13:15:35	37.2	38.7
0		0	05Mav 04	13:15:40	36.5	37.8
0		0	05Mav 04	13:15:45	38.1	40.3
0		0	05Mav 04	13:15:50	42.5	46.1
0		0	05Mav 04	13:15:55	44.5	50.3
0		0	05Mav 04	13:16:00	41.9	44.6
0		0	05Mav 04	13:16:05	40.7	44.0
0		0	05Mav 04	13:16:10	40.8	45.2
0		0	05Mav 04	13:16:15	38.7	40.7
0		0	05Mav 04	13:16:20	39.2	40.9
0		0	05Mav 04	13:16:25	39.5	44.8
0		0	05Mav 04	13:16:30	44.7	49.9
0		0	05Mav 04	13:16:35	40.1	44.6
0		0	05Mav 04	13:16:40	42.8	42.8
Stop	Kev					
Run	Kev					
Measurement 2						
0		0	05Mav 04	13:43:05	67.8	72.8
0		0	05Mav 04	13:43:10	57.9	60.9
0		0	05Mav 04	13:43:15	66.0	71.5
0		0	05Mav 04	13:43:20	70.8	74.2
0		0	05Mav 04	13:43:25	69.4	73.7
0		0	05Mav 04	13:43:30	68.7	72.9
0		0	05Mav 04	13:43:35	63.5	69.2
0		0	05Mav 04	13:43:40	52.4	54.7
0		0	05Mav 04	13:43:45	50.8	52.1
0		0	05Mav 04	13:43:50	48.5	50.9
0		0	05Mav 04	13:43:55	49.6	51.4
0		0	05Mav 04	13:44:00	62.3	66.0
0		0	05Mav 04	13:44:05	66.0	68.0
0		0	05Mav 04	13:44:10	66.9	68.4
0		0	05Mav 04	13:44:15	61.7	68.5
0		0	05Mav 04	13:44:20	64.0	67.1
0		0	05Mav 04	13:44:25	65.7	67.1
0		0	05Mav 04	13:44:30	59.5	62.5
0		0	05Mav 04	13:44:35	48.1	51.5
0		0	05Mav 04	13:44:40	49.7	56.9
0		0	05Mav 04	13:44:45	62.2	65.1
0		0	05Mav 04	13:44:50	68.6	75.4
0		0	05Mav 04	13:44:55	70.3	73.1
0		0	05Mav 04	13:45:00	66.2	70.4
0		0	05Mav 04	13:45:05	70.1	72.9
0		0	05Mav 04	13:45:10	71.6	73.6
0		0	05Mav 04	13:45:15	59.6	63.9
0		0	05Mav 04	13:45:20	65.6	68.7
0		0	05Mav 04	13:45:25	63.9	65.6
0		0	05Mav 04	13:45:30	66.1	66.7
0		0	05Mav 04	13:45:35	69.1	70.6
0		0	05Mav 04	13:45:40	65.4	69.1
0		0	05Mav 04	13:45:45	54.7	59.1
0		0	05Mav 04	13:45:50	45.8	47.6
0		0	05Mav 04	13:45:55	45.2	46.0
0		0	05Mav 04	13:46:00	44.7	46.2
0		0	05Mav 04	13:46:05	45.2	46.4
0		0	05Mav 04	13:46:10	44.5	46.1
0		0	05Mav 04	13:46:15	47.7	52.9
0		0	05Mav 04	13:46:20	71.6	74.8
0		0	05Mav 04	13:46:25	70.4	72.1
0		0	05Mav 04	13:46:30	71.5	73.5
0		0	05Mav 04	13:46:35	70.8	73.8
0		0	05Mav 04	13:46:40	58.4	62.9
0		0	05Mav 04	13:46:45	59.6	64.9
0		0	05Mav 04	13:46:50	68.1	73.1
0		0	05Mav 04	13:46:55	69.4	72.0
0		0	05Mav 04	13:47:00	71.1	73.5
0		0	05Mav 04	13:47:05	69.3	72.3
0		0	05Mav 04	13:47:10	61.9	66.5
0		0	05Mav 04	13:47:15	58.1	64.3
0		0	05Mav 04	13:47:20	72.1	75.0
0		0	05Mav 04	13:47:25	68.0	74.3
0		0	05Mav 04	13:47:30	68.8	71.6
0		0	05Mav 04	13:47:35	71.5	74.1
0		0	05Mav 04	13:47:40	69.2	73.3
0		0	05Mav 04	13:47:45	70.0	73.8
0		0	05Mav 04	13:47:50	64.8	68.9
0		0	05Mav 04	13:47:55	64.5	68.4
0		0	05Mav 04	13:48:00	70.0	70.8
0		0	05Mav 04	13:48:05	68.1	70.8
0		0	05Mav 04	13:48:10	58.9	60.8
0		0	05Mav 04	13:48:15	51.5	56.5
0		0	05Mav 04	13:48:20	47.9	48.8
0		0	05Mav 04	13:48:25	47.7	48.5
0		0	05Mav 04	13:48:30	47.9	49.9
0		0	05Mav 04	13:48:35	65.0	70.3
0		0	05Mav 04	13:48:40	61.2	66.3
0		0	05Mav 04	13:48:45	53.9	56.3

0	0	05May 04 13:48:50	59.4	65.7	0	0	05May 04 13:59:55	71.5	75.3
0	0	05May 04 13:48:55	67.2	68.9	0	0	05May 04 14:00:00	68.3	72.4
0	0	05May 04 13:49:00	69.3	71.6	0	0	05May 04 14:00:05	56.6	59.1
0	0	05May 04 13:49:05	67.7	70.6	0	0	05May 04 14:00:10	52.8	54.5
0	0	05May 04 13:49:10	73.1	77.1	0	0	05May 04 14:00:15	50.6	54.5
0	0	05May 04 13:49:15	64.4	66.5	0	0	05May 04 14:00:20	49.9	51.6
0	0	05May 04 13:49:20	61.9	64.3	0	0	05May 04 14:00:25	51.4	54.0
0	0	05May 04 13:49:25	54.3	58.0	0	0	05May 04 14:00:30	70.2	74.4
0	0	05May 04 13:49:30	50.5	54.0	0	0	05May 04 14:00:35	69.5	74.6
0	0	05May 04 13:49:35	68.1	71.0	0	0	05May 04 14:00:40	72.0	74.8
0	0	05May 04 13:49:40	64.6	69.6	0	0	05May 04 14:00:45	67.0	68.6
0	0	05May 04 13:49:45	62.0	66.3	0	0	05May 04 14:00:50	68.9	72.5
0	0	05May 04 13:49:50	65.0	66.0	0	0	05May 04 14:00:55	60.3	65.0
0	0	05May 04 13:49:55	68.1	72.4	0	0	05May 04 14:01:00	59.7	61.5
0	0	05May 04 13:50:00	66.6	72.5	0	0	05May 04 14:01:05	62.7	66.3
0	0	05May 04 13:50:05	64.8	67.9	0	0	05May 04 14:01:10	65.6	67.4
0	0	05May 04 13:50:10	56.7	59.5	0	0	05May 04 14:01:15	57.3	62.8
0	0	05May 04 13:50:15	67.6	72.1	0	0	05May 04 14:01:20	57.5	66.9
0	0	05May 04 13:50:20	64.9	67.5	0	0	05May 04 14:01:25	64.2	67.8
0	0	05May 04 13:50:25	63.1	67.5	0	0	05May 04 14:01:30	57.5	60.0
0	0	05May 04 13:50:30	58.9	63.8	0	0	05May 04 14:01:35	53.0	54.9
0	0	05May 04 13:50:35	66.6	74.8	0	0	05May 04 14:01:40	52.8	54.1
0	0	05May 04 13:50:40	68.1	75.0	0	0	05May 04 14:01:45	52.0	55.1
0	0	05May 04 13:50:45	54.0	57.8	0	0	05May 04 14:01:50	50.8	53.9
0	0	05May 04 13:50:50	60.7	62.5	0	0	05May 04 14:01:55	50.8	52.8
0	0	05May 04 13:50:55	51.7	56.6	0	0	05May 04 14:02:00	52.8	54.9
0	0	05May 04 13:51:00	50.4	52.5	0	0	05May 04 14:02:05	62.2	65.6
0	0	05May 04 13:51:05	51.6	52.8	0	0	05May 04 14:02:10	71.1	75.6
0	0	05May 04 13:51:10	49.4	50.4	0	0	05May 04 14:02:15	75.9	81.8
0	0	05May 04 13:51:15	52.5	58.0	0	0	05May 04 14:02:20	70.4	76.5
0	0	05May 04 13:51:20	59.5	61.3	0	0	05May 04 14:02:25	71.8	74.1
0	0	05May 04 13:51:25	55.3	59.9	0	0	05May 04 14:02:30	68.2	70.3
0	0	05May 04 13:51:30	48.0	50.1	0	0	05May 04 14:02:35	71.1	75.0
0	0	05May 04 13:51:35	47.4	49.0	0	0	05May 04 14:02:40	62.2	67.8
0	0	05May 04 13:51:40	47.6	51.0	0	0	05May 04 14:02:45	66.2	69.6
0	0	05May 04 13:51:45	47.5	49.8	0	0	05May 04 14:02:50	59.3	60.9
0	0	05May 04 13:51:50	48.2	50.7	0	0	05May 04 14:02:55	55.4	57.4
0	0	05May 04 13:51:55	52.9	57.3	0	0	05May 04 14:03:00	62.6	69.9
0	0	05May 04 13:52:00	62.7	65.5	0	0	05May 04 14:03:05	67.9	70.4
0	0	05May 04 13:52:05	64.3	65.4	0	0	05May 04 14:03:10	66.5	68.1
0	0	05May 04 13:52:10	81.0	88.5	0	0	05May 04 14:03:15	67.2	68.5
0	0	05May 04 13:52:15	77.7	86.0	0	0	05May 04 14:03:20	61.7	66.6
0	0	05May 04 13:52:20	71.2	75.1	0	0	05May 04 14:03:25	60.4	63.0
0	0	05May 04 13:52:25	72.1	76.4	0	0	05May 04 14:03:30	62.3	63.8
0	0	05May 04 13:52:30	59.7	62.6	0	0	05May 04 14:03:35	70.8	75.6
0	0	05May 04 13:52:35	57.5	60.0	0	0	05May 04 14:03:40	71.3	74.0
0	0	05May 04 13:52:40	53.2	55.5	0	0	05May 04 14:03:45	67.9	72.4
0	0	05May 04 13:52:45	64.0	67.5	0	0	05May 04 14:03:50	68.6	71.4
0	0	05May 04 13:52:50	57.6	62.7	0	0	05May 04 14:03:55	64.0	68.1
0	0	05May 04 13:52:55	49.1	50.8	0	0	05May 04 14:04:00	68.1	72.6
0	0	05May 04 13:53:00	66.6	71.0	0	0	05May 04 14:04:05	64.1	66.5
0	0	05May 04 13:53:05	69.8	72.0	0	0	05May 04 14:04:10	65.2	67.4
0	0	05May 04 13:53:10	72.8	76.1	0	0	05May 04 14:04:15	52.6	58.6
0	0	05May 04 13:53:15	62.1	67.6	0	0	05May 04 14:04:20	49.4	52.6
0	0	05May 04 13:53:20	75.6	81.3	0	0	05May 04 14:04:25	58.2	61.6
0	0	05May 04 13:53:25	69.3	71.0	0	0	05May 04 14:04:30	57.7	61.7
0	0	05May 04 13:53:30	69.7	72.0	0	0	05May 04 14:04:35	66.6	70.4
0	0	05May 04 13:53:35	66.4	67.9	0	0	05May 04 14:04:40	59.7	63.5
0	0	05May 04 13:53:40	67.8	69.6	0	0	05May 04 14:04:45	56.2	64.6
0	0	05May 04 13:53:45	67.9	69.6	0	0	05May 04 14:04:50	51.6	55.1
0	0	05May 04 13:53:50	69.0	70.9	0	0	05May 04 14:04:55	54.5	54.9
0	0	05May 04 13:53:55	63.9	70.5	Stop	Kev			
0	0	05May 04 13:54:00	50.5	53.1	Run	Kev	Measurement 4		
0	0	05May 04 13:54:05	61.1	64.3	0	0	05May 04 14:29:00	46.7	52.5
0	0	05May 04 13:54:10	58.2	62.8	0	0	05May 04 14:29:05	46.2	49.7
0	0	05May 04 13:54:15	47.7	49.1	0	0	05May 04 14:29:10	44.7	48.9
0	0	05May 04 13:54:20	48.2	50.8	0	0	05May 04 14:29:15	43.7	46.0
0	0	05May 04 13:54:25	47.0	48.4	0	0	05May 04 14:29:20	44.3	46.8
0	0	05May 04 13:54:30	69.6	75.1	0	0	05May 04 14:29:25	43.4	45.8
0	0	05May 04 13:54:35	66.2	72.5	0	0	05May 04 14:29:30	42.5	44.6
0	0	05May 04 13:54:40	61.2	68.9	0	0	05May 04 14:29:35	43.7	45.7
0	0	05May 04 13:54:45	67.8	72.5	0	0	05May 04 14:29:40	44.7	48.1
0	0	05May 04 13:54:50	56.0	59.6	0	0	05May 04 14:29:45	45.5	49.3
0	0	05May 04 13:54:55	64.5	68.9	0	0	05May 04 14:29:50	46.7	51.0
0	0	05May 04 13:55:00	70.4	72.1	0	0	05May 04 14:29:55	47.2	50.9
0	0	05May 04 13:55:05	66.3	69.9	0	0	05May 04 14:30:00	47.6	50.3
0	0	05May 04 13:55:10	67.3	71.0	0	0	05May 04 14:30:05	47.1	49.9
0	0	05May 04 13:55:15	72.9	76.8	0	0	05May 04 14:30:10	47.1	50.8
0	0	05May 04 13:55:20	63.9	68.5	0	0	05May 04 14:30:15	47.0	48.8
0	0	05May 04 13:55:25	56.2	59.1	0	0	05May 04 14:30:20	47.2	50.5
0	0	05May 04 13:55:30	53.7	58.0	0	0	05May 04 14:30:25	45.1	46.8
0	0	05May 04 13:55:35	49.8	52.1	0	0	05May 04 14:30:30	43.8	46.2
0	0	05May 04 13:55:40	57.8	62.6	0	0	05May 04 14:30:35	44.8	46.7
0	0	05May 04 13:55:45	59.9	63.8	0	0	05May 04 14:30:40	45.3	47.0
0	0	05May 04 13:55:50	49.4	50.5	0	0	05May 04 14:30:45	45.0	48.0
0	0	05May 04 13:55:55	67.5	72.8	0	0	05May 04 14:30:50	46.7	48.3
0	0	05May 04 13:56:00	66.6	70.3	0	0	05May 04 14:30:55	46.1	48.2
0	0	05May 04 13:56:05	72.0	76.3	0	0	05May 04 14:31:00	45.4	47.2
0	0	05May 04 13:56:10	70.3	73.3	0	0	05May 04 14:31:05	46.0	47.4
0	0	05May 04 13:56:15	64.5	65.6	0	0	05May 04 14:31:10	44.2	45.8
0	0	05May 04 13:56:20	64.1	71.9	0	0	05May 04 14:31:15	45.7	47.4
0	0	05May 04 13:56:25	69.9	72.3	0	0	05May 04 14:31:20	48.3	51.0
0	0	05May 04 13:56:30	62.0	68.4	0	0	05May 04 14:31:25	48.7	52.2
0	0	05May 04 13:56:35	51.7	53.4	0	0	05May 04 14:31:30	47.5	50.4
0	0	05May 04 13:56:40	66.8	73.3	0	0	05May 04 14:31:35	46.7	50.3
0	0	05May 04 13:56:45	65.9	71.8	0	0	05May 04 14:31:40	45.1	47.8
0	0	05May 04 13:56:50	68.6	73.8	0	0	05May 04 14:31:45	46.5	48.8
0	0	05May 04 13:56:55	70.6	74.3	0	0	05May 04 14:31:50	45.8	48.9
0	0	05May 04 13:57:00	66.6	72.3	0	0	05May 04 14:31:55	45.8	48.7
0	0	05May 04 13:57:05	63.0	66.0	0	0	05May 04 14:32:00	43.7	46.4
0	0	05May 04 13:57:10	65.8	67.3	0	0	05May 04 14:32:05	44.9	48.9
0	0	05May 04 13:57:15	62.1	64.5	0	0	05May 04 14:32:10	45.4	49.5
0	0	05May 04 13:57:20	67.2	73.5	0	0	05May 04 14:32:15	45.3	48.9
0	0	05May 04 13:57:25	68.9	73.5	0	0	05May 04 14:32:20	43.8	48.3
0	0	05May 04 13:57:30	65.6	69.5	0	0	05May 04 14:32:25	43.9	48.9
0	0	05May 04 13:57:35	67.0	68.4	0	0	05May 04 14:32:30	42.8	43.5
0	0	05May 04 13:57:40	68.6	71.3	0	0	05May 04 14:32:35	42.6	44.2
0	0	05May 04 13:57:45	69.2	72.3	0	0	05May 04 14:32:40	41.9	44.3
0	0	05May 04 13:57:50	68.1	72.6	0	0	05May 04 14:32:45	44.5	49.6
0	0	05May 04 13:57:55	64.0	65.9	0	0	05May 04 14:32:50	44.6	48.4
0	0	05May 04 13:58:00	62.4	64.9	0	0	05May 04 14:32:55	47.5	53.3
0	0	05May 04 13:58:05	71.1	74.8	0	0	05May 04 14:33:00	45.0	50.2
0	0	05May 04 13:58:10	72.8	76.1	0	0	05May 04 14:33:05	45.4	49.7
0	0	05May 04 13:58:15	67.9	71.6	0	0	05May 04 14:33:10	49.2	52.8
0	0	05May 04 13:58:20	57.4	62.1	0	0	05May 04 14:33:15	50.7	55.4
0	0	05May 04 13:58:25	52.3	55.1	0	0	05May 04 14:33:20	48.6	51.6
0	0	05May 04 13:58:30	67.2	72.6	0	0	05May 04 14:33:25	50.7	54.6
0	0	05May 04 13:58:35	63.7	70.5	0	0	05May 04 14:33:30	45.4	50.6
0	0	05May 04 13:58:40	54.7	56.0	0	0	05May 04 14:33:35	47.6	52.4
0	0	05May 04 13:58:45	63.2	67.5	0	0	05May 04 14:33:40	47.3	51.8
0	0	05May 04 13:58:50	65.1	67.8	0	0	05May 04 14:33:45	46.4	50.6
0	0	05May 04 13:58:55	68.1	70.1	0	0	05May 04 14:33:50	48.8	52.4
0	0	05May 04 13:59:00	59.0	64.4	0	0	05May 04 14:33:55	45.8	49.6
0	0	05May 04 13:59:05	49.9	52.8	0	0	05May 04 14:34:00	45.9	50.9
0	0	05May 04 13:59:10	49.7	51.5	0	0	05May 04 14:34:05	45.7	49.2
0	0	05May 04 13:59:15	49.8	51.6	0	0	05May 04 14:34:10	48.5	53.1
0	0	05May 04 13:59:20	52.6	55.5	0	0	05May 04 14:34:15	47.4	51.1
0	0	05May 04 13:59:25	54.1	57.3	0	0	05May 04 14:34:20	47.6	53.4
0	0	05May 04 13:59:30	51.2	54.1	0	0	05May 04 14:34:25	47.9	53.8
0	0	05May 04 13:59:35	50.5	53.3	0	0	05May 04 14:34:30	49.0	53.6
0	0	05May 04 13:59:40	66.6	73.3	0	0	05May 04 14:34:35	46.6	50.3
0	0	05May 04 13:59:45	67.9	72.8	0	0	05May 04 14:34:40	46.9	51.7
0	0	05May 04 13:59:50	70.0	73.1	0	0	05May 04 14:34:45	46.9	51.2

0		0	05May 04 14:34:50	45.4	49.1
0		0	05May 04 14:34:55	49.6	54.3
0		0	05May 04 14:35:00	47.0	51.0
0		0	05May 04 14:35:05	47.8	53.2
0		0	05May 04 14:35:10	44.4	47.2
0		0	05May 04 14:35:15	44.4	47.0
0		0	05May 04 14:35:20	45.8	48.6
0		0	05May 04 14:35:25	46.1	48.3
0		0	05May 04 14:35:30	45.4	49.2
0		0	05May 04 14:35:35	44.7	47.3
0		0	05May 04 14:35:40	48.4	51.3
0		0	05May 04 14:35:45	46.7	50.8
0		0	05May 04 14:35:50	46.5	48.7
0		0	05May 04 14:35:55	48.2	50.8
0		0	05May 04 14:36:00	46.9	52.6
0		0	05May 04 14:36:05	48.4	52.7
0		0	05May 04 14:36:10	46.2	50.2
0		0	05May 04 14:36:15	48.4	52.7
0		0	05May 04 14:36:20	44.5	50.8
0		0	05May 04 14:36:25	47.6	53.0
0		0	05May 04 14:36:30	45.9	51.0
0		0	05May 04 14:36:35	42.7	45.2
0		0	05May 04 14:36:40	45.1	48.7
0		0	05May 04 14:36:45	42.8	45.5
0		0	05May 04 14:36:50	46.9	51.3
0		0	05May 04 14:36:55	45.1	57.0
0		0	05May 04 14:37:00	45.9	51.2
0		0	05May 04 14:37:05	43.2	45.5
0		0	05May 04 14:37:10	44.0	45.5
0		0	05May 04 14:37:15	44.9	53.3
0		0	05May 04 14:37:20	44.3	46.0
0		0	05May 04 14:37:25	43.3	45.2
0		0	05May 04 14:37:30	42.5	44.9
0		0	05May 04 14:37:35	42.7	46.6
0		0	05May 04 14:37:40	42.3	45.9
0		0	05May 04 14:37:45	42.0	46.0
0		0	05May 04 14:37:50	41.8	44.6
0		0	05May 04 14:37:55	41.6	45.0
0		0	05May 04 14:38:00	42.1	45.0
0		0	05May 04 14:38:05	42.0	44.1
0		0	05May 04 14:38:10	42.0	45.6
0		0	05May 04 14:38:15	41.5	44.1
0		0	05May 04 14:38:20	47.0	50.7
0		0	05May 04 14:38:25	47.0	50.4
0		0	05May 04 14:38:30	42.2	44.7
0		0	05May 04 14:38:35	41.8	44.1
0		0	05May 04 14:38:40	42.2	45.0
0		0	05May 04 14:38:45	42.7	45.7
0		0	05May 04 14:38:50	44.0	48.6
0		0	05May 04 14:38:55	43.0	49.4
0		0	05May 04 14:39:00	44.9	48.9
0		0	05May 04 14:39:05	45.0	49.9
0		0	05May 04 14:39:10	42.8	45.9
0		0	05May 04 14:39:15	43.6	50.6
0		0	05May 04 14:39:20	43.5	49.0
0		0	05May 04 14:39:25	46.4	50.6
0		0	05May 04 14:39:30	46.9	50.6
0		0	05May 04 14:39:35	42.0	45.4
0		0	05May 04 14:39:40	42.0	44.8
0		0	05May 04 14:39:45	42.3	44.0
0		0	05May 04 14:39:50	41.4	42.5
0		0	05May 04 14:39:55	42.3	45.1
0		0	05May 04 14:40:00	42.4	45.8
0		0	05May 04 14:40:05	41.4	44.5
0		0	05May 04 14:40:10	42.7	45.6
0		0	05May 04 14:40:15	41.5	44.9
0		0	05May 04 14:40:20	42.9	45.6
0		0	05May 04 14:40:25	41.2	41.8
0		0	05May 04 14:40:30	43.6	47.4
0		0	05May 04 14:40:35	43.7	46.9
0		0	05May 04 14:40:40	43.2	46.1
0		0	05May 04 14:40:45	43.0	46.0
0		0	05May 04 14:40:50	42.3	44.3
0		0	05May 04 14:40:55	41.8	43.3
0		0	05May 04 14:41:00	42.5	45.8
0		0	05May 04 14:41:05	41.4	44.0
0		0	05May 04 14:41:10	42.0	45.0
0		0	05May 04 14:41:15	41.9	43.0
0		0	05May 04 14:41:20	43.2	44.6
0		0	05May 04 14:41:25	41.4	42.0
0		0	05May 04 14:41:30	42.4	46.0
0		0	05May 04 14:41:35	41.9	46.3
0		0	05May 04 14:41:40	41.0	41.5
0		0	05May 04 14:41:45	41.3	43.5
0		0	05May 04 14:41:50	40.9	41.7
0		0	05May 04 14:41:55	41.0	41.8
0		0	05May 04 14:42:00	43.3	45.7
0		0	05May 04 14:42:05	42.4	45.9
0		0	05May 04 14:42:10	43.2	45.8
0		0	05May 04 14:42:15	45.5	47.0
0		0	05May 04 14:42:20	45.2	47.2
0		0	05May 04 14:42:25	44.7	46.0
0		0	05May 04 14:42:30	44.0	45.7
0		0	05May 04 14:42:35	44.5	46.0
0		0	05May 04 14:42:40	46.1	49.9
0		0	05May 04 14:42:45	46.3	47.2
0		0	05May 04 14:42:50	46.2	47.3
0		0	05May 04 14:42:55	44.9	46.2
0		0	05May 04 14:43:00	45.7	47.9
0		0	05May 04 14:43:05	43.7	45.9
0		0	05May 04 14:43:10	44.6	47.0
0		0	05May 04 14:43:15	42.0	43.3
0		0	05May 04 14:43:20	41.7	44.2
0		0	05May 04 14:43:25	41.8	44.5
0		0	05May 04 14:43:30	41.8	44.3
0		0	05May 04 14:43:35	41.6	42.9
0		0	05May 04 14:43:40	43.9	47.8
0		0	05May 04 14:43:45	46.2	50.6
0		0	05May 04 14:43:50	44.9	51.3
0		0	05May 04 14:43:55	44.5	47.1
0		0	05May 04 14:44:00	45.4	46.8

Stop Kev
Run Kev

ATTACHMENT 2

TNM Input/Output—Measured Conditions

RECON Environmental
Jessica Fleming

24 February 2011
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Measured Receivers

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
EB Mast	12.0	1	1	6,325,705.5	1,889,497.6	418.00				Average	
		2	2	6,326,078.5	1,889,569.5	422.00				Average	
		3	3	6,326,328.5	1,889,617.5	426.00				Average	
		4	4	6,326,508.0	1,889,652.1	430.00				Average	
		5	5	6,326,805.5	1,889,710.1	436.00					
WB Mast	12.0	1	6	6,326,790.5	1,889,740.1	436.00				Average	
		2	7	6,326,493.5	1,889,684.2	430.00				Average	
		3	8	6,326,319.0	1,889,650.4	426.00				Average	
		4	9	6,326,043.5	1,889,597.5	422.00				Average	
		5	10	6,325,682.5	1,889,527.9	418.00					

RECON Environmental 24 February 2011
Jessica Fleming TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Measured Receivers

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
EB Mast	1	1	468	45							8	45
	2	2	468	45							8	45
	3	3	468	45							8	45
	4	4	468	45							8	45
	5	5										
WB Mast	1	6	308	45					4	45	4	45
	2	7	308	45					4	45	4	45
	3	8	308	45					4	45	4	45
	4	9	308	45					4	45	4	45
	5	10										

RECON Environmental
Jessica Fleming

24 February 2011
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Measured Receivers

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
2	3	1	6,326,295.0	1,889,678.9	427.00	5.00	0.00	66	10.0	8.0	Y
3	4	1	6,326,287.0	1,889,712.4	442.00	5.00	0.00	66	10.0	8.0	Y

RECON Environmental
Jessica Fleming

24 February 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Measured Receivers
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 65 deg F, 69% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
2	3	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
3	4	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

ATTACHMENT 3

TNM Input/Output—Future Conditions, Contour Receivers

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Contour Receivers

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
EB Mast west of school	12.0	1	1	6,324,981.5	1,889,224.6	420.00				Average	
		2	2	6,325,123.0	1,889,305.2	416.00				Average	
		3	3	6,325,334.0	1,889,402.8	414.00				Average	
		4	4	6,325,487.5	1,889,454.1	416.00				Average	
		5	5	6,325,700.0	1,889,504.0	418.00				Average	
		6	6	6,326,073.0	1,889,574.6	422.00					
EB Mast east of school	12.0	6	7	6,326,073.0	1,889,574.6	422.00				Average	
		7	8	6,326,324.5	1,889,623.0	426.00				Average	
		8	9	6,326,499.5	1,889,657.5	430.00				Average	
		9	10	6,326,799.5	1,889,715.9	436.00				Average	
		10	11	6,327,120.5	1,889,777.4	436.00				Average	
		11	12	6,327,211.5	1,889,795.0	434.00				Average	
		12	13	6,327,334.5	1,889,813.4	430.00				Average	
		13	14	6,327,502.0	1,889,830.2	422.00				Average	
		14	15	6,327,665.5	1,889,837.2	412.00				Average	
		15	16	6,327,813.0	1,889,837.2	402.00				Average	
		16	17	6,327,906.5	1,889,818.0	396.00				Average	
		17	18	6,328,096.0	1,889,791.1	383.10				Average	
		18	19	6,328,325.5	1,889,761.2	367.30					
WB Mast west of school	12.0	1	20	6,328,331.0	1,889,796.8	367.30				Average	
		2	21	6,328,100.0	1,889,832.8	383.10				Average	
		3	22	6,327,910.0	1,889,860.4	396.00				Average	
		4	23	6,327,822.0	1,889,880.6	402.00				Average	
		5	24	6,327,672.0	1,889,879.6	412.00				Average	
		6	25	6,327,506.0	1,889,872.9	422.00				Average	

		7	26	6,327,328.5	1,889,854.6	430.00			Average
		8	27	6,327,201.0	1,889,836.6	434.00			Average
		9	28	6,327,085.0	1,889,813.8	436.00			Average
		10	29	6,326,793.0	1,889,758.8	436.00			Average
		11	30	6,326,518.0	1,889,704.0	430.00			Average
		12	31	6,326,327.0	1,889,668.5	426.00			Average
		13	32	6,326,084.0	1,889,620.5	422.00			
WB Mast east of school	12.0	13	33	6,326,084.0	1,889,620.5	422.00			Average
		14	34	6,325,713.5	1,889,550.5	418.00			Average
		15	35	6,325,505.5	1,889,502.5	416.00			Average
		16	36	6,325,274.0	1,889,424.8	414.00			Average
		17	37	6,325,110.0	1,889,347.0	416.00			Average
		18	38	6,324,952.5	1,889,255.9	420.00			

RECON Environmental 22 February 2011
Jessica Fleming TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Contour Receivers

Roadway	Points		Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
Name	Name	No.	V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
EB Mast west of school	1	1	848	45	17	45	9	45				
	2	2	848	45	17	45	9	45				
	3	3	848	45	17	45	9	45				
	4	4	848	45	17	45	9	45				
	5	5	848	45	17	45	9	45				
	6	6										
EB Mast east of school	6	7	820	45	17	45	8	45				
	7	8	820	45	17	45	8	45				
	8	9	820	45	17	45	8	45				
	9	10	820	45	17	45	8	45				
	10	11	820	45	17	45	8	45				
	11	12	820	45	17	45	8	45				
	12	13	820	45	17	45	8	45				
	13	14	820	45	17	45	8	45				
	14	15	820	45	17	45	8	45				
	15	16	820	45	17	45	8	45				
	16	17	820	45	17	45	8	45				
	17	18	820	45	17	45	8	45				
	18	19										
WB Mast west of school	1	20	848	45	17	45	9	45				
	2	21	848	45	17	45	9	45				
	3	22	848	45	17	45	9	45				

INPUT: TRAFFIC FOR LAeq1h Volumes **3536.2**

	4	23	848	45	17	45	9	45
	5	24	848	45	17	45	9	45
	6	25	848	45	17	45	9	45
	7	26	848	45	17	45	9	45
	8	27	848	45	17	45	9	45
	9	28	848	45	17	45	9	45
	10	29	848	45	17	45	9	45
	11	30	848	45	17	45	9	45
	12	31	848	45	17	45	9	45
	13	32						
WB Mast east of school	13	33	820	45	17	45	8	45
	14	34	820	45	17	45	8	45
	15	35	820	45	17	45	8	45
	16	36	820	45	17	45	8	45
	17	37	820	45	17	45	8	45
	18	38						

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Contour Receivers

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	5	1	6,325,878.5	1,889,719.1	457.50	5.00	0.00	66	10.0	8.0	Y
2	6	1	6,325,971.5	1,889,753.5	457.00	5.00	0.00	66	10.0	8.0	Y
3	7	1	6,326,013.0	1,889,743.0	457.00	5.00	0.00	66	10.0	8.0	Y
4	8	1	6,326,012.5	1,889,795.5	458.50	5.00	0.00	66	10.0	8.0	Y
5	9	1	6,326,077.0	1,889,787.4	457.00	5.00	0.00	66	10.0	8.0	Y
6	10	1	6,325,784.0	1,890,267.2	480.00	5.00	0.00	66	10.0	8.0	Y
7	11	1	6,326,172.0	1,889,804.6	457.50	5.00	0.00	66	10.0	8.0	Y
8	12	1	6,326,220.5	1,889,812.8	457.50	5.00	0.00	66	10.0	8.0	Y
9	13	1	6,326,375.5	1,890,421.2	456.00	5.00	0.00	66	10.0	8.0	Y
10	14	1	6,326,316.0	1,889,830.0	458.50	5.00	0.00	66	10.0	8.0	Y
11	15	1	6,326,865.0	1,889,952.2	455.00	5.00	0.00	66	10.0	8.0	Y
12	16	1	6,326,927.0	1,889,881.1	455.00	5.00	0.00	66	10.0	8.0	Y
13	17	1	6,327,030.5	1,889,971.8	454.50	5.00	0.00	66	10.0	8.0	Y
14	18	1	6,327,117.0	1,890,069.1	443.00	5.00	0.00	66	10.0	8.0	Y
15	19	1	6,327,131.0	1,889,955.0	438.00	5.00	0.00	66	10.0	8.0	Y
16	20	1	6,326,098.5	1,889,895.5	456.00	5.00	0.00	66	10.0	8.0	Y
17	21	1	6,326,215.5	1,889,951.0	445.50	5.00	0.00	66	10.0	8.0	Y
18	22	1	6,325,866.0	1,889,808.9	457.50	5.00	0.00	66	10.0	8.0	Y
19	23	1	6,327,257.5	1,889,942.9	444.00	5.00	0.00	66	10.0	8.0	Y
20	24	1	6,327,386.5	1,889,969.1	445.00	5.00	0.00	66	10.0	8.0	Y
21	25	1	6,327,471.5	1,889,989.2	445.00	5.00	0.00	66	10.0	8.0	Y
22	26	1	6,327,563.0	1,890,011.4	442.00	5.00	0.00	66	10.0	8.0	Y

INPUT: RECEIVERS

3536.2

23	27	1	6,327,715.0	1,890,029.5	441.50	5.00	0.00	66	10.0	8.0	Y
24	28	1	6,327,699.5	1,890,134.2	442.00	5.00	0.00	66	10.0	8.0	Y
25	29	1	6,327,191.0	1,890,082.8	445.50	5.00	0.00	66	10.0	8.0	Y
26	30	1	6,327,351.5	1,890,154.0	449.50	5.00	0.00	66	10.0	8.0	Y
27	31	1	6,327,133.5	1,890,440.2	480.00	5.00	0.00	66	10.0	8.0	Y
28	32	1	6,327,225.0	1,889,974.9	444.00	5.00	0.00	66	10.0	8.0	Y
29	33	1	6,327,269.0	1,890,017.2	444.00	5.00	0.00	66	10.0	8.0	Y
30	34	1	6,327,521.5	1,890,042.9	442.00	5.00	0.00	66	10.0	8.0	Y
31	35	1	6,327,798.5	1,890,441.2	453.50	5.00	0.00	66	10.0	8.0	Y
32	36	1	6,325,934.0	1,889,670.8	445.00	5.00	0.00	66	10.0	8.0	Y
33	37	1	6,326,135.0	1,889,706.6	445.00	5.00	0.00	66	10.0	8.0	Y
34	38	1	6,326,331.5	1,889,734.6	445.00	5.00	0.00	66	10.0	8.0	Y
35	39	1	6,327,418.5	1,889,942.6	445.00	5.00	0.00	66	10.0	8.0	Y
36	40	1	6,327,622.5	1,889,985.5	441.50	5.00	0.00	66	10.0	8.0	Y
37	38	1	6,326,622.5	1,889,848.0	457.50	5.00	0.00	66	10.0	8.0	Y

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Contour Receivers

Barrier Name	Type	Height Min	Height Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	If Berm Top Width	If Berm Run:Rise	Add'tnl $ per Unit Length	Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	Perturbs #Dn	On Struct?	Important Reflections?
		ft	ft	S/sq ft	S/cu yd	ft	ft:ft	S/ft			ft	ft	ft	ft	ft				
Pad Edges West	W	0.00	99.99	0.00				0.00	1	41	6,325,546.5	1,889,712.0	450.00	0.00	0.00	0	0		
									2	42	6,325,604.0	1,889,625.2	450.00	0.00	0.00	0	0		
									3	43	6,327,038.0	1,889,858.4	450.00	0.00	0.00	0	0		
									4	44	6,327,067.0	1,889,891.2	450.00	0.00	0.00	0	0		
									5	45	6,327,055.0	1,890,029.9	450.00	0.00					
Pad Edges East	W	0.00	99.99	0.00				0.00	6	46	6,327,161.0	1,890,012.6	440.00	0.00	0.00	0	0		
									7	47	6,327,186.0	1,889,925.9	440.00	0.00	0.00	0	0		
									8	48	6,327,257.5	1,889,897.0	440.00	0.00	0.00	0	0		
									9	49	6,327,485.0	1,889,937.4	440.00	0.00	0.00	0	0		
									10	50	6,327,620.0	1,889,966.2	440.00	0.00	0.00	0	0		
									11	51	6,327,749.0	1,889,987.5	440.00	0.00	0.00	0	0		
									12	52	6,327,807.0	1,890,214.9	440.00	0.00	0.00	0	0		
									13	53	6,327,853.0	1,890,515.6	450.00	0.00					

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - Contour Receivers
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 65 deg F, 69% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	5	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
2	6	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
3	7	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
4	8	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
5	9	1	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
6	10	1	0.0	49.4	66	49.4	10	----	49.4	0.0	8	-8.0
7	11	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0
8	12	1	0.0	57.7	66	57.7	10	----	57.7	0.0	8	-8.0
9	13	1	0.0	43.8	66	43.8	10	----	43.8	0.0	8	-8.0
10	14	1	0.0	59.0	66	59.0	10	----	59.0	0.0	8	-8.0
11	15	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
12	16	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
13	17	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
14	18	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
15	19	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
16	20	1	0.0	50.2	66	50.2	10	----	50.2	0.0	8	-8.0
17	21	1	0.0	47.5	66	47.5	10	----	47.5	0.0	8	-8.0
18	22	1	0.0	52.0	66	52.0	10	----	52.0	0.0	8	-8.0
19	23	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
20	24	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
21	25	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
22	26	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
23	27	1	0.0	60.3	66	60.3	10	----	60.3	0.0	8	-8.0

24	28	1	0.0	54.3	66	54.3	10	----	54.3	0.0	8	-8.0
25	29	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
26	30	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
27	31	1	0.0	51.6	66	51.6	10	----	51.6	0.0	8	-8.0
28	32	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0
29	33	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
30	34	1	0.0	57.8	66	57.8	10	----	57.8	0.0	8	-8.0
31	35	1	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0
32	36	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
33	37	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
34	38	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
35	39	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
36	40	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
37	38	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	37	0.0	0.0	0.0
All Impacted	6	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

ATTACHMENT 4

TNM Input/Output—Future Conditions, Modeled Receivers

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 1st Floor Receivers

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
EB Mast west of school	12.0	1	1	6,324,981.5	1,889,224.6	420.00				Average	
		2	2	6,325,123.0	1,889,305.2	416.00				Average	
		3	3	6,325,334.0	1,889,402.8	414.00				Average	
		4	4	6,325,487.5	1,889,454.1	416.00				Average	
		5	5	6,325,700.0	1,889,504.0	418.00				Average	
		6	6	6,326,073.0	1,889,574.6	422.00					
EB Mast east of school	12.0	6	7	6,326,073.0	1,889,574.6	422.00				Average	
		7	8	6,326,324.5	1,889,623.0	426.00				Average	
		8	9	6,326,499.5	1,889,657.5	430.00				Average	
		9	10	6,326,799.5	1,889,715.9	436.00				Average	
		10	11	6,327,120.5	1,889,777.4	436.00				Average	
		11	12	6,327,211.5	1,889,795.0	434.00				Average	
		12	13	6,327,334.5	1,889,813.4	430.00				Average	
		13	14	6,327,502.0	1,889,830.2	422.00				Average	
		14	15	6,327,665.5	1,889,837.2	412.00				Average	
		15	16	6,327,813.0	1,889,837.2	402.00				Average	
		16	17	6,327,906.5	1,889,818.0	396.00				Average	
		17	18	6,328,096.0	1,889,791.1	383.10				Average	
		18	19	6,328,325.5	1,889,761.2	367.30					
WB Mast west of school	12.0	1	20	6,328,331.0	1,889,796.8	367.30				Average	
		2	21	6,328,100.0	1,889,832.8	383.10				Average	
		3	22	6,327,910.0	1,889,860.4	396.00				Average	
		4	23	6,327,822.0	1,889,880.6	402.00				Average	
		5	24	6,327,672.0	1,889,879.6	412.00				Average	
		6	25	6,327,506.0	1,889,872.9	422.00				Average	

		7	26	6,327,328.5	1,889,854.6	430.00			Average
		8	27	6,327,201.0	1,889,836.6	434.00			Average
		9	28	6,327,085.0	1,889,813.8	436.00			Average
		10	29	6,326,793.0	1,889,758.8	436.00			Average
		11	30	6,326,518.0	1,889,704.0	430.00			Average
		12	31	6,326,327.0	1,889,668.5	426.00			Average
		13	32	6,326,084.0	1,889,620.5	422.00			
WB Mast east of school	12.0	13	33	6,326,084.0	1,889,620.5	422.00			Average
		14	34	6,325,713.5	1,889,550.5	418.00			Average
		15	35	6,325,505.5	1,889,502.5	416.00			Average
		16	36	6,325,274.0	1,889,424.8	414.00			Average
		17	37	6,325,110.0	1,889,347.0	416.00			Average
		18	38	6,324,952.5	1,889,255.9	420.00			

RECON Environmental
Jessica Fleming

22 February 2011
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 1st Floor Receivers

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
EB Mast west of school	1	1	848	45	17	45	9	45				
	2	2	848	45	17	45	9	45				
	3	3	848	45	17	45	9	45				
	4	4	848	45	17	45	9	45				
	5	5	848	45	17	45	9	45				
	6	6										
EB Mast east of school	6	7	820	45	17	45	8	45				
	7	8	820	45	17	45	8	45				
	8	9	820	45	17	45	8	45				
	9	10	820	45	17	45	8	45				
	10	11	820	45	17	45	8	45				
	11	12	820	45	17	45	8	45				
	12	13	820	45	17	45	8	45				
	13	14	820	45	17	45	8	45				
	14	15	820	45	17	45	8	45				
	15	16	820	45	17	45	8	45				
	16	17	820	45	17	45	8	45				
	17	18	820	45	17	45	8	45				
	18	19										
WB Mast west of school	1	20	848	45	17	45	9	45				
	2	21	848	45	17	45	9	45				
	3	22	848	45	17	45	9	45				

INPUT: TRAFFIC FOR LAeq1h Volumes **3536.2**

	4	23	848	45	17	45	9	45
	5	24	848	45	17	45	9	45
	6	25	848	45	17	45	9	45
	7	26	848	45	17	45	9	45
	8	27	848	45	17	45	9	45
	9	28	848	45	17	45	9	45
	10	29	848	45	17	45	9	45
	11	30	848	45	17	45	9	45
	12	31	848	45	17	45	9	45
	13	32						
WB Mast east of school	13	33	820	45	17	45	8	45
	14	34	820	45	17	45	8	45
	15	35	820	45	17	45	8	45
	16	36	820	45	17	45	8	45
	17	37	820	45	17	45	8	45
	18	38						

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TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 1st Floor Receivers

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	40	1	6,325,669.0	1,889,651.2	454.00	5.00	0.00	66	10.0	8.0	Y
2	41	1	6,325,861.0	1,889,690.0	457.50	5.00	0.00	66	10.0	8.0	Y
3	42	1	6,326,074.0	1,889,725.9	457.00	5.00	0.00	66	10.0	8.0	Y
4	43	1	6,326,232.0	1,889,752.6	457.50	5.00	0.00	66	10.0	8.0	Y
5	44	1	6,326,344.5	1,889,768.1	456.50	5.00	0.00	66	10.0	8.0	Y
6	45	1	6,326,455.0	1,889,788.5	458.50	5.00	0.00	66	10.0	8.0	Y
7	46	1	6,326,570.5	1,889,806.1	458.50	5.00	0.00	66	10.0	8.0	Y
8	47	1	6,326,667.0	1,889,818.0	457.50	5.00	0.00	66	10.0	8.0	Y
9	48	1	6,326,792.5	1,889,833.5	456.00	5.00	0.00	66	10.0	8.0	Y
10	49	1	6,326,905.5	1,889,853.2	455.00	5.00	0.00	66	10.0	8.0	Y
11	50	1	6,326,998.0	1,889,870.1	454.60	5.00	0.00	66	10.0	8.0	Y
12	51	1	6,327,045.5	1,889,936.2	454.60	5.00	0.00	66	10.0	8.0	Y
13	52	1	6,327,038.5	1,890,012.2	454.60	5.00	0.00	66	10.0	8.0	Y
14	53	1	6,327,171.0	1,889,996.8	445.50	5.00	0.00	66	10.0	8.0	Y
15	54	1	6,327,216.0	1,889,921.5	443.90	5.00	0.00	66	10.0	8.0	Y
16	55	1	6,327,297.0	1,889,918.0	443.90	5.00	0.00	66	10.0	8.0	Y
17	56	1	6,327,423.5	1,889,945.5	445.00	5.00	0.00	66	10.0	8.0	Y
18	57	1	6,327,560.0	1,889,971.5	442.20	5.00	0.00	66	10.0	8.0	Y
19	58	1	6,327,689.5	1,889,990.5	441.50	5.00	0.00	66	10.0	8.0	Y
20	59	1	6,327,779.0	1,890,191.0	443.50	5.00	0.00	66	10.0	8.0	Y

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Jessica Fleming TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 1st Floor Receivers

Barrier Name	Type	Height Min	Height Max	If Wall $ per Unit Area	If Berm $ per Unit Vol.	Top Width	Run:Rise	Add'tnl $ per Unit Length	Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Increment	Perturbs #Up	Perturbs #Dn	On Struct?	Important Reflections?
		ft	ft	S/sq ft	S/cu yd	ft	ft:ft	S/ft			ft	ft	ft	ft	ft				
West Pad Edges	W	0.00	99.99	0.00				0.00	1	54	6,325,595.0	1,889,653.2	454.00	0.00	1.00	6	0		
									2	55	6,325,603.5	1,889,639.6	454.00	0.00	1.00	6	0		
									3	56	6,325,618.0	1,889,635.2	454.00	0.00	1.00	6	0		
									4	57	6,325,749.0	1,889,660.2	454.00	0.00	1.00	6	0		
									5	58	6,325,769.5	1,889,668.5	457.50	0.00	1.00	6	0		
									6	59	6,325,949.5	1,889,697.5	457.50	0.00	1.00	6	0		
									7	60	6,325,960.5	1,889,699.6	457.00	0.00	1.00	6	0		
									8	61	6,326,159.5	1,889,734.4	457.00	0.00	1.00	6	0		
									9	62	6,326,170.0	1,889,737.1	457.50	0.00	1.00	6	0		
									10	63	6,326,294.0	1,889,756.4	457.50	0.00	1.00	6	0		
									11	64	6,326,306.0	1,889,756.2	456.50	0.00	1.00	6	0		
									12	65	6,326,385.0	1,889,768.0	456.50	0.00	1.00	6	0		
									13	66	6,326,398.5	1,889,774.0	458.50	0.00	1.00	6	0		
									14	67	6,326,613.5	1,889,806.1	458.50	0.00	1.00	6	0		
									15	68	6,326,626.0	1,889,806.0	457.50	0.00	1.00	6	0		
									16	69	6,326,709.0	1,889,817.8	457.50	0.00	1.00	6	0		
									17	70	6,326,728.5	1,889,818.2	456.00	0.00	1.00	6	0		
									18	71	6,326,851.0	1,889,838.0	456.00	0.00	1.00	6	0		
									19	72	6,326,868.5	1,889,839.0	455.00	0.00	1.00	6	0		
									20	73	6,326,941.0	1,889,852.8	455.00	0.00	1.00	6	0		
									21	74	6,326,951.5	1,889,854.0	454.60	0.00	1.00	6	0		
									22	75	6,327,033.0	1,889,870.8	454.60	0.00	1.00	6	0		
									23	76	6,327,055.5	1,889,901.6	454.60	0.00	1.00	6	0		
									24	77	6,327,044.0	1,890,039.2	454.60	0.00					
East Pad Edges	W	0.00	99.99	0.00				0.00	25	78	6,327,159.0	1,890,016.4	445.50	0.00	1.00	6	0		
									26	79	6,327,181.5	1,889,932.2	443.90	0.00	1.00	6	0		
									27	80	6,327,213.0	1,889,906.6	443.90	0.00	1.00	6	0		
									28	81	6,327,247.5	1,889,896.2	443.90	0.00	1.00	6	0		
									29	82	6,327,289.0	1,889,903.6	443.90	0.00	1.00	6	0		
									30	83	6,327,361.0	1,889,923.1	445.00	0.00	1.00	6	0		
									31	84	6,327,474.5	1,889,939.9	445.00	0.00	1.00	6	0		
									32	85	6,327,504.0	1,889,948.8	442.20	0.00	1.00	6	0		
									33	86	6,327,621.5	1,889,969.0	442.20	0.00	1.00	6	0		
									34	87	6,327,728.5	1,889,984.0	441.50	0.00	1.00	6	0		
									35	88	6,327,752.0	1,889,995.0	441.50	0.00	1.00	6	0		

									36	89	6,327,760.5	1,890,010.6	441.50	0.00	1.00	6	0		
									37	90	6,327,809.0	1,890,225.8	440.00	0.00					

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Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 1st Floor Receivers
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 65 deg F, 69% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	40	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
2	41	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
3	42	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
4	43	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
5	44	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
6	45	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
7	46	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
8	47	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
9	48	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
10	49	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
11	50	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
12	51	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
13	52	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
14	53	1	0.0	61.4	66	61.4	10	----	61.4	0.0	8	-8.0
15	54	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
16	55	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
17	56	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	8	-8.0
18	57	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	8	-8.0
19	58	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
20	59	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB

All Selected	20	0.0	0.0	0.0
All Impacted	15	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

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INPUT: RECEIVERS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 2nd Floor Receivers

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
1	40	1	6,325,669.0	1,889,651.2	454.00	15.00	0.00	66	10.0	8.0	Y
2	41	1	6,325,861.0	1,889,690.0	457.50	15.00	0.00	66	10.0	8.0	Y
3	42	1	6,326,074.0	1,889,725.9	457.00	15.00	0.00	66	10.0	8.0	Y
4	43	1	6,326,232.0	1,889,752.6	457.50	15.00	0.00	66	10.0	8.0	Y
5	44	1	6,326,344.5	1,889,768.1	456.50	15.00	0.00	66	10.0	8.0	Y
6	45	1	6,326,455.0	1,889,788.5	458.50	15.00	0.00	66	10.0	8.0	Y
7	46	1	6,326,570.5	1,889,806.1	458.50	15.00	0.00	66	10.0	8.0	Y
8	47	1	6,326,667.0	1,889,818.0	457.50	15.00	0.00	66	10.0	8.0	Y
9	48	1	6,326,792.5	1,889,833.5	456.00	15.00	0.00	66	10.0	8.0	Y
10	49	1	6,326,905.5	1,889,853.2	455.00	15.00	0.00	66	10.0	8.0	Y
11	50	1	6,326,998.0	1,889,870.1	454.60	15.00	0.00	66	10.0	8.0	Y
12	51	1	6,327,045.5	1,889,936.2	454.60	15.00	0.00	66	10.0	8.0	Y
13	52	1	6,327,038.5	1,890,012.2	454.60	15.00	0.00	66	10.0	8.0	Y
14	53	1	6,327,171.0	1,889,996.8	445.50	15.00	0.00	66	10.0	8.0	Y
15	54	1	6,327,216.0	1,889,921.5	443.90	15.00	0.00	66	10.0	8.0	Y
16	55	1	6,327,297.0	1,889,918.0	443.90	15.00	0.00	66	10.0	8.0	Y
17	56	1	6,327,423.5	1,889,945.5	445.00	15.00	0.00	66	10.0	8.0	Y
18	57	1	6,327,560.0	1,889,971.5	442.20	15.00	0.00	66	10.0	8.0	Y
19	58	1	6,327,689.5	1,889,990.5	441.50	15.00	0.00	66	10.0	8.0	Y
20	59	1	6,327,779.0	1,890,191.0	443.50	15.00	0.00	66	10.0	8.0	Y

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RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 3536.2
RUN: Castlerock - 2nd Floor Receivers
BARRIER DESIGN: INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS: 65 deg F, 69% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1	40	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
2	41	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
3	42	1	0.0	65.9	66	65.9	10	----	65.9	0.0	8	-8.0
4	43	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
5	44	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
6	45	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
7	46	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
8	47	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
9	48	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
10	49	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
11	50	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
12	51	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
13	52	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
14	53	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0
15	54	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
16	55	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
17	56	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
18	57	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
19	58	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
20	59	1	0.0	57.5	66	57.5	10	----	57.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB