DOCKETED

Docket Number:	12-AFC-03
Project Title:	Redondo Beach Energy Project
TN #:	205628
Document Title:	AES Response to Request for Technical Noise Data - 07-23-15
Description:	N/A
Filer:	Jon Welner
Organization:	Jeffer Mangels Butler & Mitchell LLP
Submitter Role:	Intervenor Representative
Submission Date:	8/3/2015 7:25:31 PM
Docketed Date:	8/4/2015

ELLISON, SCHNEIDER & HARRIS L.L.P.
ATTORNEYS AT LAW
2600 CAPITOL AVENUE, SUITE 400
SACRAMENTO, CALIFORNIA 95816
TELEPHONE: (916) 447-2166
http://www.eslawfirm.com

July 23, 2015

Mr. Jon Welner, Esq.
Counsel for City of Redondo Beach
Jeffer Mangels Butler & Mitchell LLP
Two Embarcadero Center, Fifth Floor
San Francisco, CA 94111

Dear Mr. Welner:

I am writing in response to your email data request dated June 18, 2015.

Although your new data requests are untimely, we will respond to these requests as a courtesy to the City. In doing so, however, we do not waive our right to object to these requests or any further untimely data requests that the City may proffer in the future.

Before responding, I would like to put this request in its proper context. You initially requested the "technical study" conducted to support the Application for Certification ("AFC") for the Redondo Beach Energy Project ("RBEP") at the California Energy Commission ("CEC") Staff Workshop on May 20, 2015,[1] which I offered to make available at your request.

In an email sent at 7:05 pm on Friday, May 22, 2015, you wrote to "follow up on your offer during the workshop to provide a copy of the noise study performed by your consultants for the RBEP." On June 2, 2015, in response to your request for the "noise study performed by your consultants", I provided to you a copy of the Noise Section of the AFC, related Appendices, and copies of data responses provided by the Applicant to the Staff and the City relating to noise, satisfying your request for the noise study performed for the RBEP.

I also explained that:

> Consistent with established CEC protocols and typical project development and design processes, the Applicant has not yet performed the type of detailed acoustical design and equipment specification study described by the City at the PSA Workshop.

---

[1] See, Intervenor City of Redondo Beach's Status Report, Exhibit A, http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN204907_20150604T175207_City_of_Redondo_Beach__Status_Report__060415.pdf . This letter assumes that the transcript provided as Exhibit A is a true and accurate reproduction of the conversation presented at the workshop.

> Instead, as we explained in response to Staff Data Request 30, 'Prior to the start of construction, the Project Owner's engineering contractor will determine the necessary acoustical design treatments to ensure that the City of Redondo Beach noise standards are satisfied.' The expected project operational noise level at the closest residence on N. Elena Avenue is less than 55 dBA. A project level of 55 dBA complies with the applicable City of Redondo Beach noise limitations at this location, and, following the assessment methodology used by the CEC as proposed by Charles Salter, will also comply with the indoor noise limitations at this location.

You replied in an email sent June 2, 2015 at 5:36 pm. You stated that the information you had "expected" to receive included the following:

- Equipment noise levels that are the basis of [the] analysis (including their reference source for information).
- Documentation showing which noise reduction measures were included in their analysis and thus should become necessary mitigation to achieve their projected noise levels.
- Noise reduction data for the mitigation measures.
- Calculation methodology with site plan details and other assumptions of acoustical shielding, directivity, and similar factors.
- Safety factor used in their analysis.

I replied on June 3, 2015, stating that "At the workshop I agreed to provide you with the noise analysis prepared by the Applicant in support of this AFC. As I indicated in my earlier email, the type of 'technical noise analysis' described by the City at the workshop and in your email below is prepared prior to the start of construction (as it has been for every other power plant licensed by the Commission). The type of analysis you refer to is not available prior to June 4."

In the City's late-filed Status Report,[2] the City abandoned its claim that it was seeking "the noise study", and instead claimed that it requested "data".[3] The City stated that it "will file a motion to require AES to produce the technical data underlying its noise analysis."[4]

---

[2] See, *Intervenor City of Redondo Beach's Status Report*, docketed on June 5, 2015, available at: http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN204907_20150604T175207_City_of_Redondo_Beach__Status_Report__060415.pdf.
[3] *Intervenor City of Redondo Beach's Status Report*, p. 4, docketed on June 5, 2015, available at: http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN204907_20150604T175207_City_of_Redondo_Beach__Status_Report__060415.pdf.
[4] *Intervenor City of Redondo Beach's Status Report*, p. 5, docketed on June 5, 2015, available at:

However, no motion has been filed. We presume that the City did not file a motion to compel the production of any noise data, because it discovered that, in fact, it had been requesting the noise study, and had not requested specific technical data from the Applicant.

In an email sent on June 18, at 6:04 pm, you wrote to me that there "may be a misunderstanding about the data being requested by the City." You stated that you were not asking AES to perform any additional studies. Instead, you asked that the Applicant "provide the data and calculations underlying statements made in the AFC and responses to data requests." This has been the only request that I have received from you requesting data and calculations underlying specific statements in the AFC, and it is incorrect to state that "the City has repeatedly asked for the data," as alleged in the City's most recent late-filed Status Report.[5]

As you are aware, the deadline for submitting data requests in this proceeding has long passed. The deadline to submit data requests was February 24, 2014. During the discovery period, the City submitted data requests relating to Noise to the Applicant on the last day of the discovery period. Your most recent requests for the data underlying the statements in the AFC and data responses set forth in your June 18, 2015 email were not included in your February 24, 2014 data requests to the Applicant.

The response to your data requests is attached.

Sincerely,

Greggory L. Wheatland
Attorneys for the Applicant

Attachments

http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN204907_20150604T175207_City_of_Redondo_Beach__Status_Report__060415.pdf.

[5] *Intervenor City of Redondo Beach's Status Report*, p. 3, docketed on June 7, 2015, available at: http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN205252_20150706T210127_City_of_Redondo_Beach__Status_Report__070615.pdf

Redondo Beach Energy Project

(12-AFC-03)

Responses to Data Requests from City of Redondo Beach

Prepared by

AES Southland Development LLC.

July 23, 2015

Responses to the City's June 18, 2015 Email

Provided below are the Applicant's responses to technical data requested in the City of Redondo Beach's June 18th email.

Request: "Provide all ambient noise measurement data for monitor locations M1, M2, M3, and M4. Provide hourly measured noise levels, including Leq, L10, L50, L90, and Lmax; and the existing power plant total facility output (in MW) during each hour of noise monitoring."

Response: Ambient sound levels were collected to support the preparation of the AFC and in response to Data Requests 26-28 from CEC Staff. Detailed noise monitoring data was provided by the Applicant in AFC Appendix 5.7A. In response to Staff's Data Request 26-28, a noise monitoring plan was docketed on February 3, 2014.[1] This monitoring plan was executed and a complete response to Data Requests 26-28 was filed by the Applicant on May 22, 2014.[2] Questions and responses regarding the monitoring data relied upon by CEC Staff for the Preliminary Staff Assessment ("PSA") were docketed by CEC Staff on May 19, 2015.[3]

All of this information, except the record of conversation, was provided to the City of Redondo Beach as an attachment to the email from Greggory L. Wheatland, Attorneys for the Applicant, on June 2nd. The power plant output information can be found at the aforementioned document docketed by CEC Staff on May 19th.

Request: "Provide an electronic copy of the CADNA/A noise model file; all parameters that were input to the noise model; and all supporting calculations and data (with source documentation) used to establish the parameters."

Response: AFC Section 5.7 presents an overview of the modeling and responses to Data Requests 69-70 and 72 provide additional detail. These documents were provided to the City of Redondo Beach as an attachment to the email from Greggory L. Wheatland, Attorneys for the Applicant, on June 2nd.

As noted in AFC Section 5.7.3.3.3, the preliminary noise model for the RBEP was developed using the CADNA/A commercial software package by DataKustik GmbH of Munich, Germany.

The sound propagation factors selected for the RBEP within CADNA/A were adopted from International Organization for Standardization (ISO) 9613-2, Acoustics – Sound Attenuation during Propagation Outdoors (ISO, 1996). The project site was modeled with a ground absorption factor (G) of 0.0 where G=0.0 is fully reflective and G=1.0 is absorptive. Off-site areas were modeled with a G=0.25. Shielding from only two of the off-site structures were modeled. These storage buildings immediately east of the project were modeled as being 5

---

1 See, Redondo Beach Energy Project Data Response Set 1C- Responses to CEC Staff Data Requests 26R-28R, available at: http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN201628_20140203T155656_12AFC03_DR_Set_1C_26R28R.pdf.

2 See, Redondo Beach Energy Project Data Response Set 1C- Revises Responses to CEC Staff Data Requests 26R-28R, available at: http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN202364_20140522T115709_12AFC03_DR_Set_1C_26R28RREVISED.pdf.

3 See, http://docketpublic.energy.ca.gov/PublicDocuments/12-AFC-03/TN204656_20150519T130236_Questions_and_responses_that_staff_relied_upon_in_developing_it.pdf .

meters tall with an approximate 20 meter gap between the northern and southern building. The potential shielding afforded from other off-site structures was not considered in the model.

It should be noted that most major equipment for RBEP is located within buildings or structures. Such buildings are common for power projects in California that rely on reciprocating engines where interior sound pressure levels can exceed 105 dBA and are used on combustion turbine based power facilities, such as RBEP, in urbanized settings or areas subject to inclement weather.

The Applicant provides that following additional data used in the preliminary acoustical assessment. The average sound pressure level at the interior wall and ceiling surfaces of the combustion turbine generator (CTG) portion of the building was modeled to be 87 dBA/99 dBC, while the heat recovery steam generator (HRSG) portion of the building, which includes the boiler feed water pumps, was modeled with an average interior sound pressure level of 79 dBA/88 dBC. The average interior of the Steam Turbine Generator (STG) building walls and ceiling surfaces were modeled to have a sound pressure level of 97 dBA/101 dBC and the interior of the gas compressor building wall and ceiling surfaces was modeled as 103 dBA/108 dBC. All building walls and ceilings were modeled to have a Sound Transmission Class (STC) of 45 with a minimum Transmission Loss (TL) of 17 dB in the lower frequencies (31.5 and 63 Hz). As design progresses, the acoustical performance of the buildings may be revised. Experience in California and elsewhere has documented the acoustical effectiveness of similar structures.

The primary outdoor sources of equipment noise are limited to the combustion turbine stack exit, the air-cooled condenser (ACC), fin fan cooler and transformers. Localized sound walls have been included around the fin fan cooler as well as the transformers. The ACC fans and associated heat exchangers are surrounded by a wind wall that also provides some barrier effect, though the ACC is open at both the top and bottom to allow for air flow. The Applicant notes that the bottom represents the air inlet side of the ACC fan and was modeled to have an overall sound power level of 100 dBA/109 dBC. The air outlet side was modeled to have an overall sound power level of 97 dBA/106 dBC. The ACC duct will be enclosed and/or acoustically lagged. The combustion turbine stack exit is anticipated by the Applicant to have sound power level of 88 dBA and the current noise contours reflect a louder stack sound power level of 117 dBA/122 dBC when directivity is not considered. Detailed equipment specifications, including stack silencing requirements will be developed during final design and equipment procurement and may include silencing in the horizontal section of the HRSG as well as inside the stack. The Applicant is providing the attached RBEP CADNA/A model input data tables.

The technical analysis conducted for the RBEP is consistent with that conducted for other projects, including many that have been built and are operating in full compliance with their Conditions of Certification without incident. Typically, the CEC permitting process does not require certain detailed equipment specifications. Rather, the goal is to establish performance based acoustical thresholds at the point of reception, for example noise limits at residential properties. As detailed design progresses numerous discussions will occur with multiple vendors, all of whom have slightly different technical offerings. During this detailed design phase, which occurs after the project has been licensed, the project design team (typically a large Engineering, Procurement and Construction (EPC) team) conducts additional detailed acoustical evaluations and design analysis to ensure the acoustical criteria as outlined in the Conditions of Certification are satisfied. Similar analyses are conducted for parasitic electrical loads, heat rate, air quality emission rates, and other contract commitments. It is understood that the project must be constructed and operated in accordance with the Conditions of Certification, but the level of acoustical analysis requested by the City has not been and typically is not conducted at this stage of the permitting process. The analysis requested by the City is conducted at the detailed design stage once vendor offerings are examined and equipment procured.

Request: "Provide the source or reference documentation used to determine the equipment sound levels."

Response: Please see our response above. The sound propagation factors used in the model were adopted from International Organization for Standardization (ISO) 9613-2, Acoustics – Sound Attenuation during Propagation Outdoors (ISO, 1996). The specific source for each Sound Power Level in Table 5.7-10 is based on proprietary and confidential equipment vendor information. The generator step up transformers sound power levels are based on the anticipated Mega-Volt Ampere rating (250 MVA for the STG transformer) and the Edison Electric Institutes calculation method (other publicly available reference methods result in similar values). The unenclosed boiler feed water pump sound power level is based on data from CH2M's work on other projects and is similar to that derived using the Edison Electric Institutes method.

Request: "Provide the noise reduction data (with source documentation) and related calculations used for all of these noise mitigation measures as incorporated into the noise model."

Response: The question references the third paragraph of page 5.7.12 of the AFC. This paragraph describes "design measures" that "have been incorporated into the preliminary modeling." By preliminary modeling, we mean that these are measures that are intended to be evaluated and likely incorporated into the final design of the project. As described above, the final specific equipment and features have not yet been identified, and therefore it is not possible to provide specific "data" and "source documentation" for these measures. The data that is available for some of these measures is considered confidential and proprietary by the equipment vendors. As noted previously, these measures are subject to refinement and change during final design. However, as noted above, building walls and ceilings were modeled to have a Sound Transmission Class (STC) of 45 with a minimum Transmission Loss (TL) of 17 dB in the lower frequencies (31.5 and 63 Hz). As design progresses, the acoustical performance of the buildings may be revised.

Request: "Provide the calculations and data (with source documentation) used to develop the predicted operational noise levels."

Response: This request relates to page 4.7-18, Noise Table 7, Column 2, and page 4.7-20, Noise Table 8, Column 2 of the PSA. The Applicant incorporates by reference our response to the questions above. Further, we also suggest that if the City had questions about the PSA, these questions should properly have been included in the City's filed comments on the PSA, so that the Staff would have proper and timely notice of these questions.

Request: "Provide the calculations and data (with source documentation) used to develop this noise contour map."

Response: This request relates to page 4.7-40, Noise-Figure 1 of the PSA. The source for this figure was Applicant's Data Response 72, Figure DR 72-1. As explained in Data Response 72, Figure DR72-1 identifies the expected noise level contours from the RBEP, based on current knowledge of the types, locations, and source levels of the equipment to be used during operations. The noise contour map was developed with the data discussed above and the Applicant incorporates by reference our response to the questions above.

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m^2)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Stack		Stack	116.6	116.6	116.6	Lw	StkExitR1-4		0	0	0							0		Air Exhaust	40	r	371091.5	3746529	44.36
Stack		Stack	116.6	116.6	116.6	Lw	StkExitR1-4		0	0	0							0		Air Exhaust	40	r	371055.7	3746524	44.33
Stack		Stack	116.6	116.6	116.6	Lw	StkExitR1-4		0	0	0							0		Air Exhaust	40	r	371126.3	3746534	44.47
StackCasing		StackBO	63.1	63.1	63.1	Lw	Stack_BO		0	0	0							0		(none)	20	r	371056.1	3746524	24.37
StackCasing		StackBO	63.1	63.1	63.1	Lw	Stack_BO		0	0	0							0		(none)	20	r	371091.9	3746529	24.38
StackCasing		StackBO	63.1	63.1	63.1	Lw	Stack_BO		0	0	0							0		(none)	20	r	371126.7	3746534	24.46
GT Transformer		GTTrans	98.3	98.3	98.3	Lw	GT_Trans		0	0	0							0		(none)	7	r	371056.5	3746435	11.27
GT Transformer		GTTrans	98.3	98.3	98.3	Lw	GT_Trans		0	0	0							0		(none)	7	r	371093.3	3746439	11.27
GT Transformer		GTTrans	98.3	98.3	98.3	Lw	GT_Trans		0	0	0							0		(none)	7	r	371128	3746444	11.27
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371061.3	3746445	8.27
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371060.7	3746449	8.27
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371097.4	3746453	8.27
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371096.6	3746458	8.36
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371132.6	3746458	8.29
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371131.9	3746463	8.36
Aux Transformer		AuxTrans	94.7	94.7	94.7	Lw	AuxTrans		0	0	0							0		(none)	4	r	371103.8	3746550	8.27
STG Trans		STGTrans	101.3	101.3	101.3	Lw	ST_Trans		0	0	0							0		(none)	8	r	371097.3	3746549	12.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371080.8	3746570	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371081.5	3746565	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371082.5	3746560	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371089	3746571	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371089.7	3746566	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371090.5	3746561	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371097.8	3746572	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371098.6	3746567	9.27
FinFan		FinFan	100.2	100.2	100.2	Lw	FinF		0	0	0							0		(none)	5	r	371099.2	3746563	9.27

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Pipe Rack		PipeRack	60.5	60.5	60.5	46.6	46.6	46.6	Lw	PipeRack-5		0	0	0			STC45				0		(none)				
Pipe Rack		PipeRack	60.5	60.5	60.5	46.7	46.7	46.7	Lw	PipeRack-5		0	0	0			STC45				0		(none)				
Pipe Rack		PipeRack	60.5	60.5	60.5	46.6	46.6	46.6	Lw	PipeRack-5		0	0	0			STC45				0		(none)				
ACC Main Duct		ACCDuct	60.2	60.2	60.2	42.6	42.6	42.6	Lw'	ACCDuct		0	0	0			STC45				0		(none)				

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuatio	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
HRSG Building		HRSGB	70.9	70.9	70.9	35.7	35.7	35.7	Li	HRSGB		0	0	0	STC45	3305.96					0		(none)			
CTGBuilding		CTGB	83.1	83.1	83.1	47.7	47.7	47.7	Li	CTGB		0	0	0	STC45	3453.92					0		(none)			
STGBuilding		STGB	74.8	74.8	74.8	48.5	48.5	48.5	Li	STGB		0	0	0	STC45	420.68					0		(none)			
GCBuilding		GCB	84.6	84.6	84.6	56.3	56.3	56.3	Li	GCB		0	0	0	STC45	673.06					0		(none)			
Fuel Gas Conditioning		FuelSkid	99	99	99	75.8	75.8	75.8	PWL-Pt	FGC		0	0	0							0		(none)	5	5	5
ACCFan_Inlet		ACCInlet	100.1	100.1	100.1	65.3	65.3	65.3	Lw	ACCFan		0	0	0							0		(none)			
ACCFan_Outlet		ACCOutlet	97.1	97.1	97.1	62.6	62.6	62.6	Lw	ACCFan-3		0	0	0							0		(none)			

Name	M.	ID	Result. PWL Day (dBA)	Evening (dBA)	Night (dBA)	Result. PWL'' Day (dBA)	Evening (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Evening dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.
CTGBuilding		CTGB	80.5	80.5	80.5	47.7	47.7	47.7	Li	CTGB		0	0	0	STC45	1897.41					3		(none)
CTGBuilding		CTGB	75.7	75.7	75.7	47.7	47.7	47.7	Li	CTGB		0	0	0	STC45	628.1					3		(none)
CTGBuilding		CTGBOpenWall	98.9	98.9	98.9	71	71	71	Li	CTGB-10		0	0	0	0	614.41					3		Opening (ÖAL28)
HRSG Building		HRSGB	64.9	64.9	64.9	35.7	35.7	35.7	Li	HRSGB		0	0	0	STC45	825.93					3		(none)
HRSG Building		HRSGB	69.9	69.9	69.9	35.7	35.7	35.7	Li	HRSGB		0	0	0	STC45	2648.65					3		(none)
HRSG Building		HRSGB	64.8	64.8	64.8	35.7	35.7	35.7	Li	HRSGB		0	0	0	STC45	817.3					3		(none)
HRSG Building		HRSGB	64.3	64.3	64.3	35.7	35.7	35.7	Li	HRSGB		0	0	0	STC45	721.38					3		(none)
STGBuilding		STGB	72.4	72.4	72.4	48.5	48.5	48.5	Li	STGB		0	0	0	STC45	242.57					3		(none)
STGBuilding		STGB	72.7	72.7	72.7	48.5	48.5	48.5	Li	STGB		0	0	0	STC45	259.59					3		(none)
STGBuilding		STGB	72.5	72.5	72.5	48.5	48.5	48.5	Li	STGB		0	0	0	STC45	247.99					3		(none)
STGBuilding		STGB	72.7	72.7	72.7	48.5	48.5	48.5	Li	STGB		0	0	0	STC45	261					3		(none)
GCBuilding		GCB	80.9	80.9	80.9	56.3	56.3	56.3	Li	GCB		0	0	0	STC45	288.31					3		(none)
GCBuilding		GCB	77.6	77.6	77.6	56.3	56.3	56.3	Li	GCB		0	0	0	STC45	136.53					3		(none)
GCBuilding		GCB	80.9	80.9	80.9	56.3	56.3	56.3	Li	GCB		0	0	0	STC45	289.52					3		(none)
GCBuilding		GCB	77.6	77.6	77.6	56.3	56.3	56.3	Li	GCB		0	0	0	STC45	137.04					3		(none)
CTGAirInlet		CTGAirInlet	105.6	105.6	105.6	85.1	85.1	85.1	Lw	AES2		0	0	0							3		Air Inlet

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height	
			left	right		horz.	vert.	Begin	End
					(m)	(m)	(m)	(m)	(m)
ACCWindWall		ACCSkin	0.21	0.37	13.1			25.3 r	
WylandWall		WyWall	Conc	IAC_C38				27.1 r	
TransWall		TransWall	0.21	0.21				9.1 r	
TransWall		TransWall	0.21	0.21				9.1 r	
TransWall		TransWall	0.21	0.21				9.1 r	
TransWall		TransWall	0.21	0.6				9.1 r	
FinFanWall		FFWall	0.21	0.21				9.1 r	
EastPL_2		EastPL_2	Conc	Conc				9.1 r	9.1 r
CTGAirInlet		CTGAirInlet	Conc	Conc				9.7 r	

Name	M.	ID	RB	Residents	Absorption	Height Begin (m)	
CTGBuilding		CTGB		0		18.4	r
HRSG Building		HRSGB		0		25.5	r
STGBuilding		STGB		0		12.2	r
GCBuilding		GCB		0		7.6	r
Warehouse		Warehouse		0	0.37	5.8	r
Bldg1		Bldg1		0	Conc	9.1	r
Bldg1		Bldg1		0	Conc	5	r
Bldg1		Bldg1		0	Conc	5	r

Name	M.	ID	Absorption	Center x (m)	y (m)	Radius (m)	Height (m)	
				371056	3746524	3.2	40	r
				371092	3746529	3.2	40	r
				371126	3746534	3.2	40	r

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Gas Compressor Building	GCB	Li		100	100	100	100	100	100	92	92	92	103	108	
Steam Turbine Building	STGB	Li		100	95	90	90	90	90	90	90	90	97	103	
CTG_Building	CTGB	Li		99	96	89	84	82	82	80	78	69	87	101	
HRSG Building	HRSGB	Li		89	82	79	70	73	73	73	71	64	79	91	
Stack w 90 directivity	Stack_90	Li		111	107	93	76	71	68	65	58	52	83	113	
Stack breakout	Stack_BO	Li		92	88	71	49	41	36	35	30	26	63	94	
HRSG Main Body	HRSG	Li		114	111	110	103	93	91	96	98	78	103	117	
HRSG Transition	HRSGTrans	Li		116	106	95	82	66	59	59	61	38	84	116	
GT Generator	AES1	Li		118	118	113	105	108	100	97	91	78	107	122	
GT Inlet Filter	AES2	Li		106	106	109	99	98	101	100	97	88	106	113	
GT Inlet Air Duct-I	AES3	Li		96	96	99	89	88	91	90	87	78	96	103	
GT Inlet Air Duct (Silencer)	AES4	Li		104	104	107	97	96	99	98	95	86	104	111	
GT Inlet Air Duct-II	AES5	Li		103	103	106	96	95	98	97	94	85	103	110	
Gas Turbine Enclosure	AES6	Li		121	121	110	108	105	108	105	103	94	112	124	
GT Exhaust Expansion Joint	AES7	Li		93	93	91	91	88	92	92	92	86	98	101	
GT Exhaust Duct	AES8	Li		101	101	99	100	94	94	94	92	81	100	107	
GT Ventilation Fan	AES9	Li		93	93	89	86	85	81	81	78	69	88	98	
GT Cooler	AES10	Li		109	109	107	102	99	96	88	84	80	101	113	
GT Lube Oil	AES11	Li		105	105	110	110	106	105	99	89	77	109	115	
GT Fuel Gas	AES12	Li		115	115	104	102	99	102	99	97	88	106	118	
GT Transformer	GT_Trans	Li		95	101	103	98	98	91	88	83	71	98	107	
STG Transformer	ST_Trans	Li		98	104	106	101	101	94	91	86	74	101	110	
Fin Fan Cooler per Fan	FinF	Li		106	106	105	102	97	95	89	83	77	100	112	
Aux Transformer	AuxTrans	Li		95	95	95	97	95	87	80	73	66	95	103	
PipeRack_100m	PipeRack	Li		96	100	102	102	107	103	96	95	93	108	111	
ACC Main Duct	ACCDuct	Li		80	80	80	80	80	80	80	80	80	87	90	
Fuel Gas Conditioning Skid	FGC	Li		85	85	85	85	85	85	85	85	85	92	95	
ACC FanInlet	ACCFan	Lw		106	103	103	99	97	95	92	85	78	100	110	
Stack Rev1	StkExitR1	Lw		128	113	97	94	90	103	113	118	110	121	129	

Name	ID	Oktave Spectrum (dB)										Source
		31.5	63	125	250	500	1000	2000	4000	8000	Rw	
8" wall system	STC45	17	18	26	38	42	49	52	54	56	46	
Stack Exit Directivity Adj - 90 degree	Dir90	2	3	4	6	8	11	13	15	17	11	

Name	ID	Oktave Spectrum (dB)										Source
		31.5	63	125	250	500	1000	2000	4000	8000	Aw	
Concrete	Conc	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.05	
IAC C38	IAC_C38	0.15	0.34	0.68	0.95	0.95	0.95	0.9	0.81	0.75	0.95	
steel	Steel	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0	
InsideBldg	InBldg	0.02	0.05	0.1	0.2	0.03	0.35	0.4	0.4	0.4	0.1	

Directivity

Name: Air Exhaust ☐ normalized

	31.5	63	125	250	500	1000	2000	4000	8000
0°	8.0	8.0	8.0	8.0	9.0	9.0	10.0	10.0	10.0
15°	7.0	7.0	7.0	7.3	8.0	8.0	9.0	9.0	9.0
30°	6.0	6.0	6.0	6.7	7.0	7.0	8.0	8.0	8.0
45°	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0
60°	2.0	2.0	2.0	2.0	2.0	1.0	0.0	-1.0	-2.0
75°	0.0	-0.5	-1.0	-2.0	-3.0	-4.5	-6.0	-7.5	-9.0
90°	-2.0	-3.0	-4.0	-6.0	-8.0	-10.0	-12.0	-14.0	-16.0
105°	-2.3	-3.3	-4.7	-6.7	-8.7	-11.0	-13.3	-15.3	-17.3
120°	-2.7	-3.7	-5.3	-7.3	-9.3	-12.0	-14.7	-16.7	-18.7
135°	-3.0	-4.0	-6.0	-8.0	-10.0	-13.0	-16.0	-18.0	-20.0
150°	-3.0	-4.0	-6.0	-8.0	-10.0	-13.0	-16.0	-18.0	-20.0
165°	-3.0	-4.0	-6.0	-8.0	-10.0	-13.0	-16.0	-18.0	-20.0
180°	-3.0	-4.0	-6.0	-8.0	-10.0	-13.0	-16.0	-18.0	-20.0

Directivity

Name: Air Inlet ☐ normalized

	31.5	63	125	250	500	1000	2000	4000	8000
0°	8.0	8.0	8.0	8.0	9.0	9.0	10.0	10.0	10.0
15°	7.0	7.0	7.0	7.3	8.0	8.0	9.0	9.0	9.0
30°	6.0	6.0	6.0	6.7	7.0	7.0	8.0	8.0	8.0
45°	5.0	5.0	5.0	6.0	6.0	6.0	7.0	7.0	7.0
60°	2.0	2.0	2.0	2.0	2.0	1.0	0.0	-1.0	-1.0
75°	-1.5	-2.0	-2.5	-3.5	-4.5	-6.0	-7.5	-9.0	-10.0
90°	-5.0	-6.0	-7.0	-9.0	-11.0	-13.0	-15.0	-17.0	-19.0
105°	-5.3	-6.3	-7.7	-9.7	-11.7	-14.0	-16.3	-18.3	-20.3
120°	-5.7	-6.7	-8.3	-10.3	-12.3	-15.0	-17.7	-19.7	-21.7
135°	-6.0	-7.0	-9.0	-11.0	-13.0	-16.0	-19.0	-21.0	-23.0
150°	-6.0	-7.0	-9.0	-11.0	-13.0	-16.0	-19.0	-21.0	-23.0
165°	-6.0	-7.0	-9.0	-11.0	-13.0	-16.0	-19.0	-21.0	-23.0
180°	-6.0	-7.0	-9.0	-11.0	-13.0	-16.0	-19.0	-21.0	-23.0