Appendix NOI

Noise Calculations and Outputs

ESA

Goetz Road Potable Water Storage Tank Project
Construction Noise Calculations

Proposed Water Storage Tank Site Construction - Receptor to the North

Phase Name	Off-Road Equipment Type	Amount	Lmax at 50' (dBA)	Usage Factor	Leq at 50' (dBA)	Distance to Receiver (ft)	Leq at Receiver (dBA)	Leq Per Phase (dBA)	Noise Reduction with Mitigation (dBA)	Post Mitgation Noise Level (dBA)
Site Preparation	Excavators	1	85	40%	81	5	101	104	12	92
	Excavators	1	85	40%	81	105	75			
	Off-Highway Trucks	1	84	40%	80	5	100			
	Off-Highway Trucks	1	84	40%	80	205	68			
Blasting	Excavators	1	85	40%	81	76	77	84	12	72
	Excavators	1	85	40%	81	76	77			
	Off-Highway Trucks	1	84	40%	80	76	76			
	Off-Highway Trucks	1	84	40%	80	76	76			
	Scrapers	1	85	40%	81	76	77			
Grading	Excavators	1	85	40%	81	5	101	106	12	94
	Excavators	1	85	40%	81	105	75			
	Graders	1	85	40%	81	5	101			
	Off-Highway Trucks	1	84	40%	80	105	74			
	Off-Highway Trucks	1	84	40%	80	205	68			
	Plate Compactors	1	80	20%	73	5	93			
	Plate Compactors	1	80	20%	73	205	61			
	Scrapers	1	85	40%	81	5	101			
	Sweepers/Scrubbers	1	80	10%	70	205	58			
Tank Installation	Air Compressors	1	80	40%	76	205	64	104	12	92
	Cranes	1	85	16%	77	205	65			
	Cranes	1	85	16%	77	105	71			
	Excavators	1	85	40%	81	5	101			
	Excavators	1	85	40%	81	105	75			
	Off-Highway Trucks	1	84	40%	80	105	74			
	Off-Highway Trucks	1	84	40%	80	5	100			
	Welders	1	73	40%	69	205	57			
Paving	Excavators	1	85	40%	81	5	101	105	12	93
	Excavators	1	85	40%	81	105	75			
	Off-Highway Trucks	1	84	40%	80	105	74			
	Off-Highway Trucks	1	84	40%	80	205	68			
	Pavers	1	85	50%	82	5	102			
Testing/Start-up	Off-Highway Trucks	1	84	40%	80	5	100	100	12	88

Goetz Road Potable Water Storage Tank Project
Construction Noise Calculations

Proposed Water Storage Tank Site Construction - Receptor to the South

Phase Name	Off-Road Equipment Type	Amount	Lmax at 50' (dBA)	Usage Factor	Leq at 50' (dBA)	Distance to Receiver (ft)	Leq at Receiver (dBA)	Leq Per Phase (dBA)	Noise Reduction with Mitigation (dBA)	Post Mitgation Noise Level (dBA)
Site Preparation	Excavators	1	85	40%	81	59	80	83	12	71
	Excavators	1	85	40%	81	159	71			
	Off-Highway Trucks	1	84	40%	80	59	79			
	Off-Highway Trucks	1	84	40%	80	259	66			
Blasting	Excavators	1	85	40%	81	90	76	83	12	71
	Excavators	1	85	40%	81	90	76			
	Off-Highway Trucks	1	84	40%	80	90	75			
	Off-Highway Trucks	1	84	40%	80	90	75			
	Scrapers	1	85	40%	81	90	76			
Grading	Excavators	1	85	40%	81	59	80	85	12	73
	Excavators	1	85	40%	81	159	71			
	Graders	1	85	40%	81	59	80			
	Off-Highway Trucks	1	84	40%	80	159	70			
	Off-Highway Trucks	1	84	40%	80	259	66			
	Plate Compactors	1	80	20%	73	59	72			
	Plate Compactors	1	80	20%	73	259	59			
	Scrapers	1	85	40%	81	59	80			
	Sweepers/Scrubbers	1	80	10%	70	259	56			
Tank Installation	Air Compressors	1	80	40%	76	259	62	83	12	71
	Cranes	1	85	16%	77	259	63			
	Cranes	1	85	16%	77	159	67			
	Excavators	1	85	40%	81	59	80			
	Excavators	1	85	40%	81	159	71			
	Off-Highway Trucks	1	84	40%	80	159	70			
	Off-Highway Trucks	1	84	40%	80	59	79			
	Welders	1	73	40%	69	259	55			
Paving	Excavators	1	85	40%	81	59	80	84	12	72
	Excavators	1	85	40%	81	159	71			
	Off-Highway Trucks	1	84	40%	80	159	70			
	Off-Highway Trucks	1	84	40%	80	259	66			
	Pavers	1	85	50%	82	59	81			
Testing/Start-up	Off-Highway Trucks	1	84	40%	80	59	79	79	12	67

Goetz Road Potable Water Storage Tank Project
Construction Noise Calculations

Proposed Water Storage Tank Site Construction - Receptor to the West

Phase Name	Off-Road Equipment Type	Amount	Lmax at 50' (dBA)	Usage Factor	Leq at 50' (dBA)	Distance to Receiver (ft)	Leq at Receiver (dBA)	Leq Per Phase (dBA)	Noise Reduction with Mitigation (dBA)	Post Mitgation Noise Level (dBA)
Site Preparation	Excavators	1	85	40%	81	61	79	82	12	70
	Excavators	1	85	40%	81	161	71			
	Off-Highway Trucks	1	84	40%	80	61	78			
	Off-Highway Trucks	1	84	40%	80	261	66			
Blasting	Excavators	1	85	40%	81	88	76	83	12	71
	Excavators	1	85	40%	81	88	76			
	Off-Highway Trucks	1	84	40%	80	88	75			
	Off-Highway Trucks	1	84	40%	80	88	75			
	Scrapers	1	85	40%	81	88	76			
Grading	Excavators	1	85	40%	81	61	79	85	12	73
	Excavators	1	85	40%	81	161	71			
	Graders	1	85	40%	81	61	79			
	Off-Highway Trucks	1	84	40%	80	161	70			
	Off-Highway Trucks	1	84	40%	80	261	66			
	Plate Compactors	1	80	20%	73	61	71			
	Plate Compactors	1	80	20%	73	261	59			
	Scrapers	1	85	40%	81	61	79			
	Sweepers/Scrubbers	1	80	10%	70	261	56			
Tank Installation	Air Compressors	1	80	40%	76	261	62	83	12	71
	Cranes	1	85	16%	77	261	63			
	Cranes	1	85	16%	77	161	67			
	Excavators	1	85	40%	81	61	79			
	Excavators	1	85	40%	81	161	71			
	Off-Highway Trucks	1	84	40%	80	161	70			
	Off-Highway Trucks	1	84	40%	80	61	78			
	Welders	1	73	40%	69	261	55			
Paving	Excavators	1	85	40%	81	61	79	83	12	71
	Excavators	1	85	40%	81	161	71			
	Off-Highway Trucks	1	84	40%	80	161	70			
	Off-Highway Trucks	1	84	40%	80	261	66			
	Pavers	1	85	50%	82	61	80			
Testing/Start-up	Off-Highway Trucks	1	84	40%	80	61	78	78	12	66

Goetz Road Potable Water Storage Tank Project
Construction Noise Calculations

Proposed Pipeline Construction

Phase Name	Off-Road Equipment Type	Amount	Lmax at 50'	Usage	at 50'
Pavement Cutting	Excavators	2	85	40%	84
Pavement Cutting	Off-Highway Trucks	2	84	40%	83
Excavation	Excavators	2	85	40%	84
Excavation	Off-Highway Trucks	2	84	40%	83
Shoring	Excavators	2	85	40%	84
Shoring	Off-Highway Trucks	1	84	40%	80
Pipeline Installation	Excavators	2	85	40%	84
Pipeline Installation	Off-Highway Trucks	1	84	40%	80
Pipeline Installation	Off-Highway Trucks	1	84	40%	80
Backfill/Compaction	Excavators	2	85	40%	84
Backfill/Compaction	Off-Highway Trucks	2	84	40%	83
Backfill/Compaction	Rollers	1	85	20%	78
Backfill/Compaction	Plate Compactors	1	80	20%	73
Paving	Off-Highway Trucks	1	84	40%	80
Paving	Pavers	1	85	50%	82
Paving	Rollers	1	85	20%	78
Site Restoration/Testing	Off-Highway Trucks	1	84	40%	80

Phase Name	Phase Type	at 50'	Distance (feet) / Noise Level (dBA)			
			140	340	160	25
Pavement Cutting	Demolition	87	82	78	82	90
Excavation	Grading	87	82	78	82	90
Shoring	Site Preparation	85	81	77	80	88
Pipeline Installation	Site Preparation	87	82	78	82	90
Backfill/Compaction	Grading	87	83	79	82	90
Paving	Paving	85	81	77	80	88
Site Restoration/Testing	Building Construction	80	76	72	75	83

Goetz Road Water Storage Tank and Transmission Pipeline Project
Blasting Noise Calculation

Conversion from 3 second Lmax to 1-minute Leq

	Seconds	dBA Lmax	Anti-Log Calc.
0 minutes	1	83	199526231.5
	2	83	199526231.5
	3	83	199526231.5
	4	0	1
	5	0	1
	6	0	1
	7	0	1
	8	0	1
	9	0	1
	10	0	1
	11	0	1
	12	0	1
	13	0	1
	14	0	1
	15	0	1
	16	0	1
	17	0	1
	18	0	1
	19	0	1
	20	0	1
	21	0	1
	22	0	1
	23	0	1
	24	0	1
	25	0	1
	26	0	1
	27	0	1
	28	0	1
	29	0	1
0.5 minutes	30	0	1
	31	0	1
	32	0	1
	33	0	1
	34	0	1
	35	0	1
	36	0	1
	37	0	1
	38	0	1
	39	0	1
	40	0	1
	41	0	1
	42	0	1
	43	0	1
	44	0	1
	45	0	1
	46	0	1
	47	0	1
	48	0	1
	49	0	1
	50	0	1
	51	0	1
	52	0	1
	53	0	1
	54	0	1
	55	0	1
	56	0	1
	57	0	1
	58	0	1
	59	0	1
1 minute	60	0	1

Sum of Anti-Log	Divide by 60	Re-convert to Log
598,578,751.49	9,976,312.52	**69.99 dBA Leq (1-minute average)**
(Total sound energy)	*(Number of samples)*	*(Convert to decibel scale)*