Ullrich Water Treatment Plant Community Meeting

The meeting will start momentarily.

May 17, 2023

Agenda

- Welcome and Logistics
- Introductions
- Operations Update
- Sound Survey Update
- Questions and Answers
- Conclusion

Welcome and Logistics

- Ask for technical assistance from the meeting hosts in the Chat

- Submit questions or comments for the presenters in the Q&A

Introductions

Speakers

- Stephanie Sue, Operations Manager
- Bryan Barnett, Facility Engineering Supervisor
- Emlea Chanslor, Community Outreach

Executive Team Members

- Anna Bryan-Borja, Assistant Director of Business Services
- Randi Jenkins, Assistant Director of Customer Experience

Opening Comments

Anna Bryan-Borja, Assistant Director of Business Services

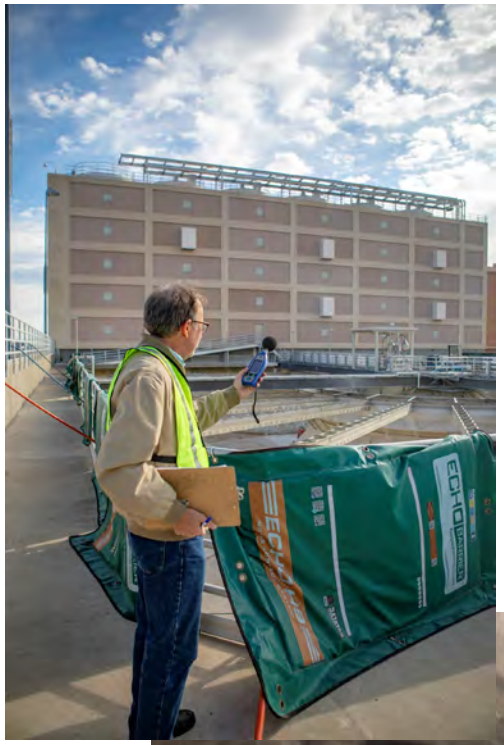
Operations Update

Stephanie Sue, PE

Plant Overview

- One of three City of Austin drinking water plants
- Built in 1968
- Upgraded in 2006 from 100 MGD capacity to current capacity
- 167 MGD capacity
- Provides water to residents and wholesale customers predominately in South Austin including the community of West Lake Hills

Basin Cleaning Update



- Annual activity to maintain basins and water treatment capabilities
- Required due to calcium carbonate accumulation that is inherent to treatment process
- Basins 2 and 4 completed by end of 2022
- Equipment placement and sound panels to reduce noise impact

Steps taken to reduce plant noise

- Internal lime blower in service
- Limited hours for lime deliveries
- Fence barrier installed at construction trailers
- HVAC issue at AT&T tower fixed

Sound Study Update - Summary

Bryan Barnett, PE

Overview

- Hired Engineering Consultants, Kennedy Jenks & CSTI
- Recorded ambient sound and vibration data – Nov. 17-21, 2022
  - Measured Nighttime Sounds => Comparable to 2007 Nelson Data Collection
  - New: Continuously Measured Ambient Daytime Sounds
  - New: Measured Specific noises, such as basin cleaning equipment
  - New: Measured ground vibrations
- Next Step: Determining most effective mitigation techniques with Sound Modeling

Background – Kathy Fretwell, P.E.

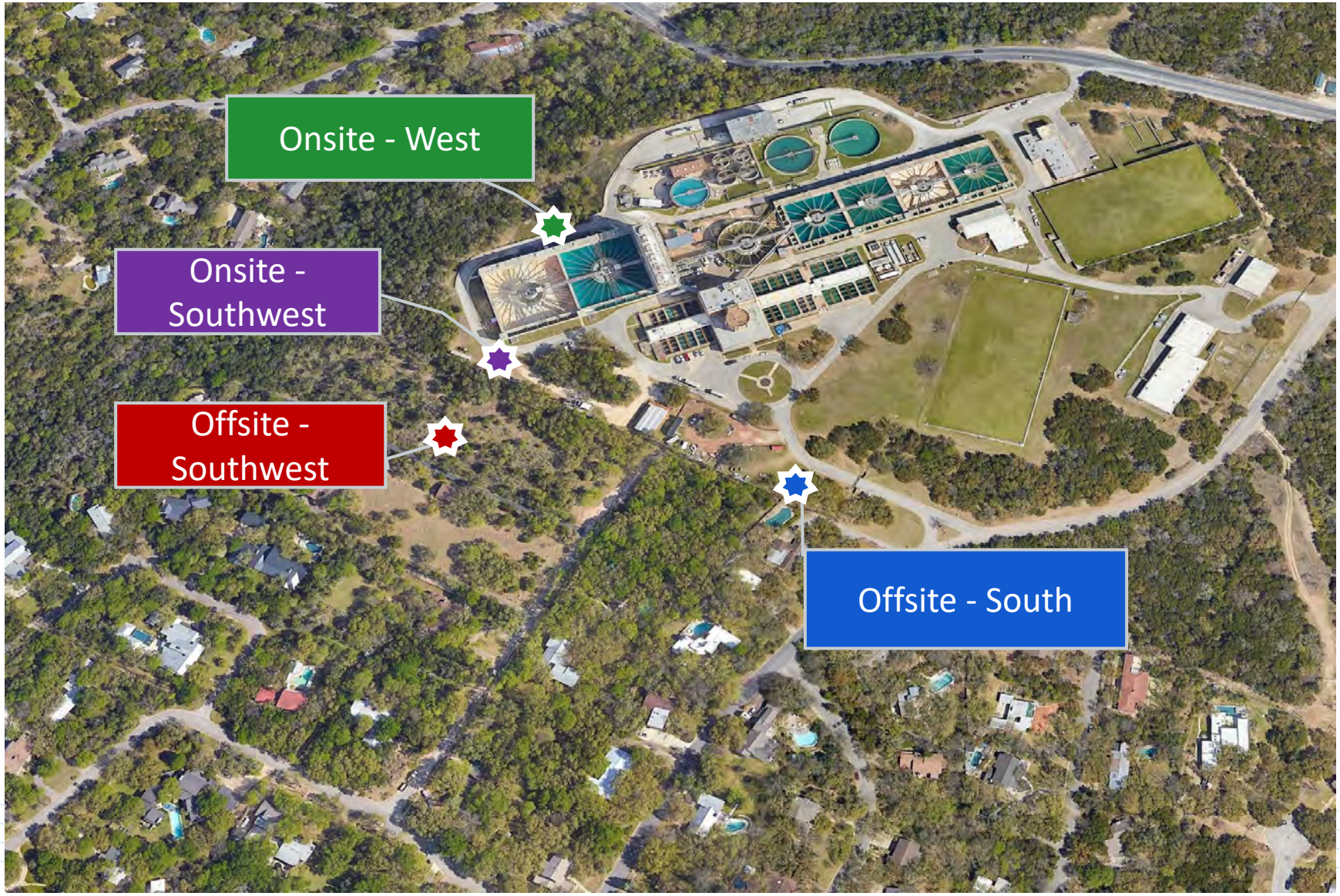
Kennedy Jenks

- Professional Engineer, Vice President
- 29 Years Experience in Water & Wastewater Engineering
  - Design and Construction of Water and Wastewater Treatment Plants
  - Pump Stations
  - Small & Large Diameter Pipelines

Background – Arno Bommer

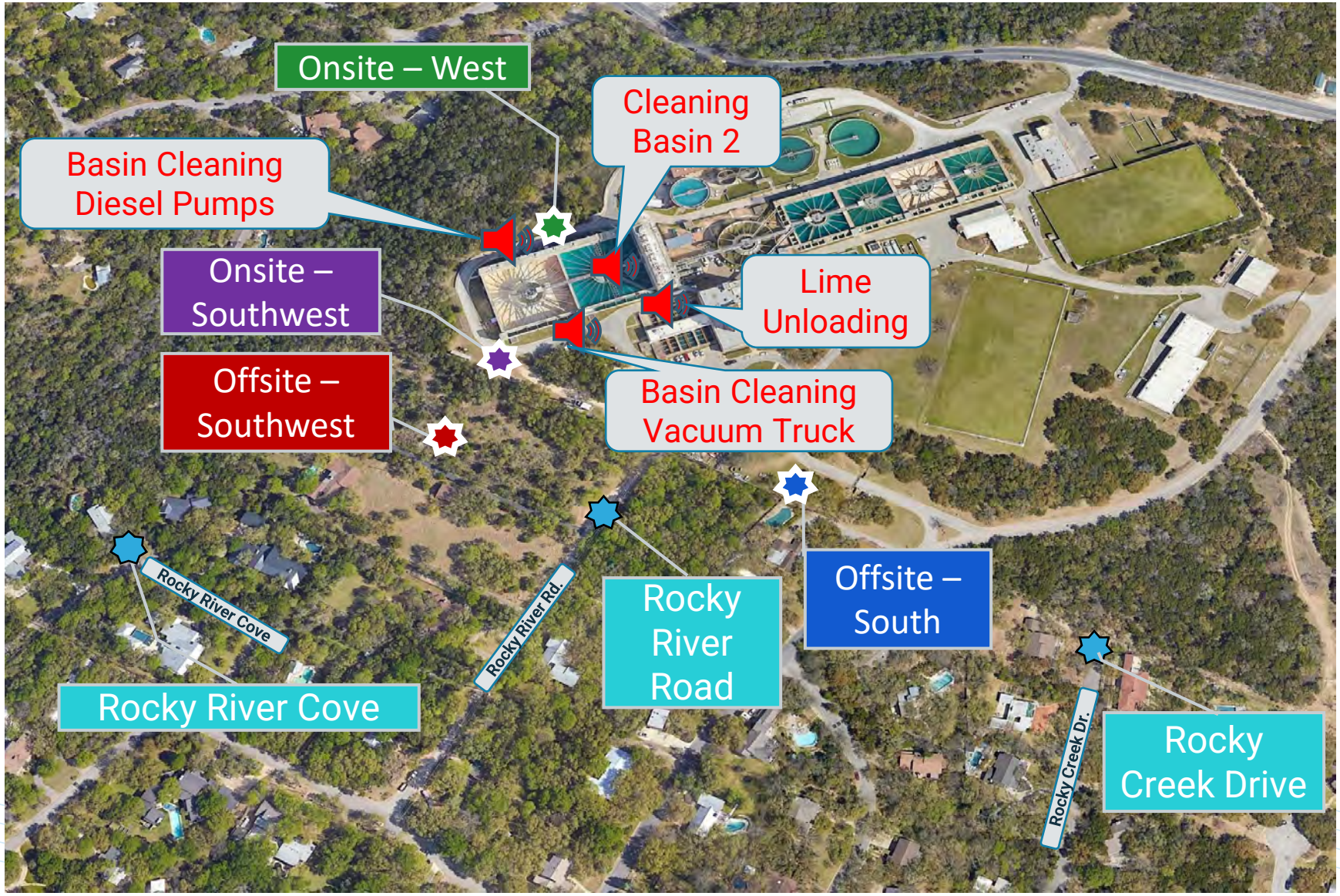
- Graduate of MIT
- Working in acoustics since 1982
- Board certified by the Institute of Noise Control Engineering (INCE/USA)
- Awarded the Laymon N. Miller Award for Excellence in Acoustical Consulting by INCE/USA and NCAC in 2022

Where We Started – 2007 Data Collection



- 2007 Nelson Data Collection placed recorders at four locations for the hours of 4 pm to 8 am for 4 days
- Data Collection was during October – loud insect noises

What We've Done – 2022 Study



- Recorded both day and night (24 hours for 4 days)
- Took additional "spot" readings at noise sources and at offsite locations
- Measured ground vibrations at 14 locations around the plant perimeter

Where We're Going – Modeling

- Create 3-D computer sound model for both normal and intermittent operations of Ullrich Facility

- Use model to assess the effectiveness of different noise treatments such as noise barriers and sound absorption

- Produce final report of noise collection data, noise modeling analysis, and recommendations by Fall 2023

- **Once the Sound Study (Report) is complete, we will review recommendations to finalize mitigation strategies.**
- **This could result in new CIP projects, O&M changes, or a combination of the two**

Ullrich Water Treatment Plant

2022 Noise Study

Kennedy Jenks

Work conducted by CSTI Acoustics subcontracted to Kennedy Jenks

Primary objectives :

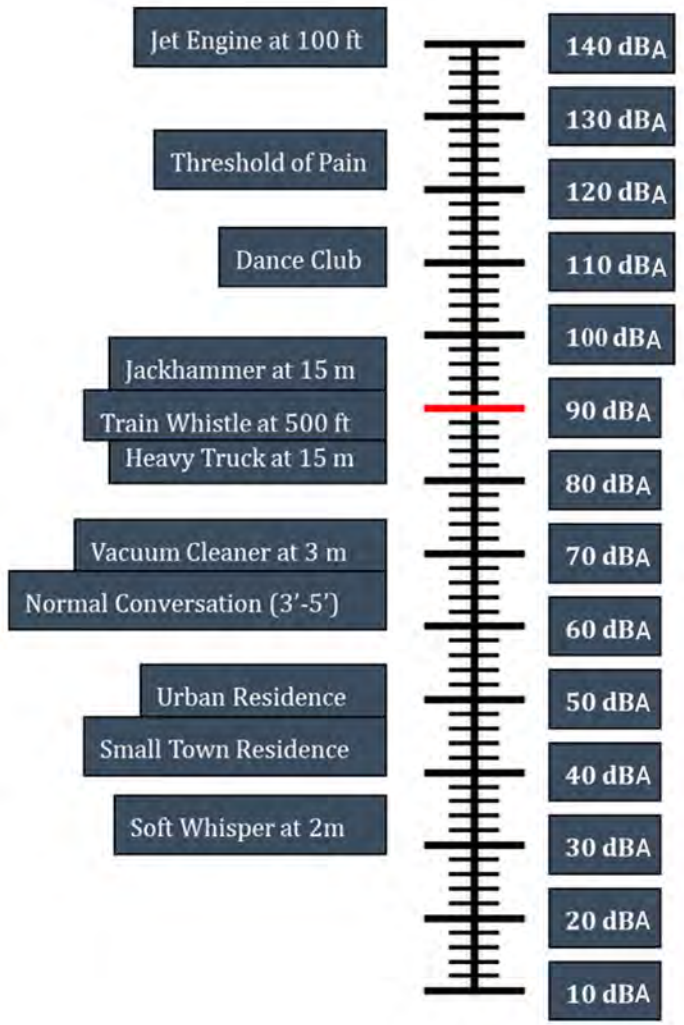
- Measure sound levels for comparison with 2007 Nelson Noise Data Collection
- Measure sound levels from basin cleaning operations
- Measure sound reduction achieved by interior lime blower
- Measure ground vibration levels

Ullrich Water Treatment Plant 2022 Noise Study

- Measurements were made Thursday, November 17 to Monday, November 21, 2022
- The facility was operating normally during the measurements
- Basin Cleaning operations were conducted on November 17 and 18
- Lime loading was conducted on November 17, 18, and 21
- Some construction work on a new parking lot was being conducted on weekdays including grading and back-up alarms

Ways to Describe Sound

- **Frequency** – Measured in Hz (cycles per second). Sounds at different frequencies are often grouped together in octave bands.
- **Loudness**
  - **Level** (Amplitude or volume) – Measured in decibels (dB)
  - **dBA** (A-weighted sound level) – Single-number rating of "loudness" at all frequencies combined.
  - **dBC** (C-weighting sound level) – used less often, more emphasis on low frequencies.
- **Variations in frequency and level over time** – Quantified in several ways including:
  - **Lmax** (maximum during sample)
  - **Lmin** (minimum during sample)
  - **Leq** (equivalent sound level – a type of average)
  - **LOSHA/TWA** (time-weighted average)



Challenges of Managing and Mitigating Noise

Sounds are produced:

- At different times of day
- For different lengths of time

Audibility is affected by:

- Frequency of sound (tones)
- Loudness of sound
- Loudness of background sound (masking)

Sound is produced by:

- Mechanical equipment
- Water splashing
- Alarms
- Truck traffic

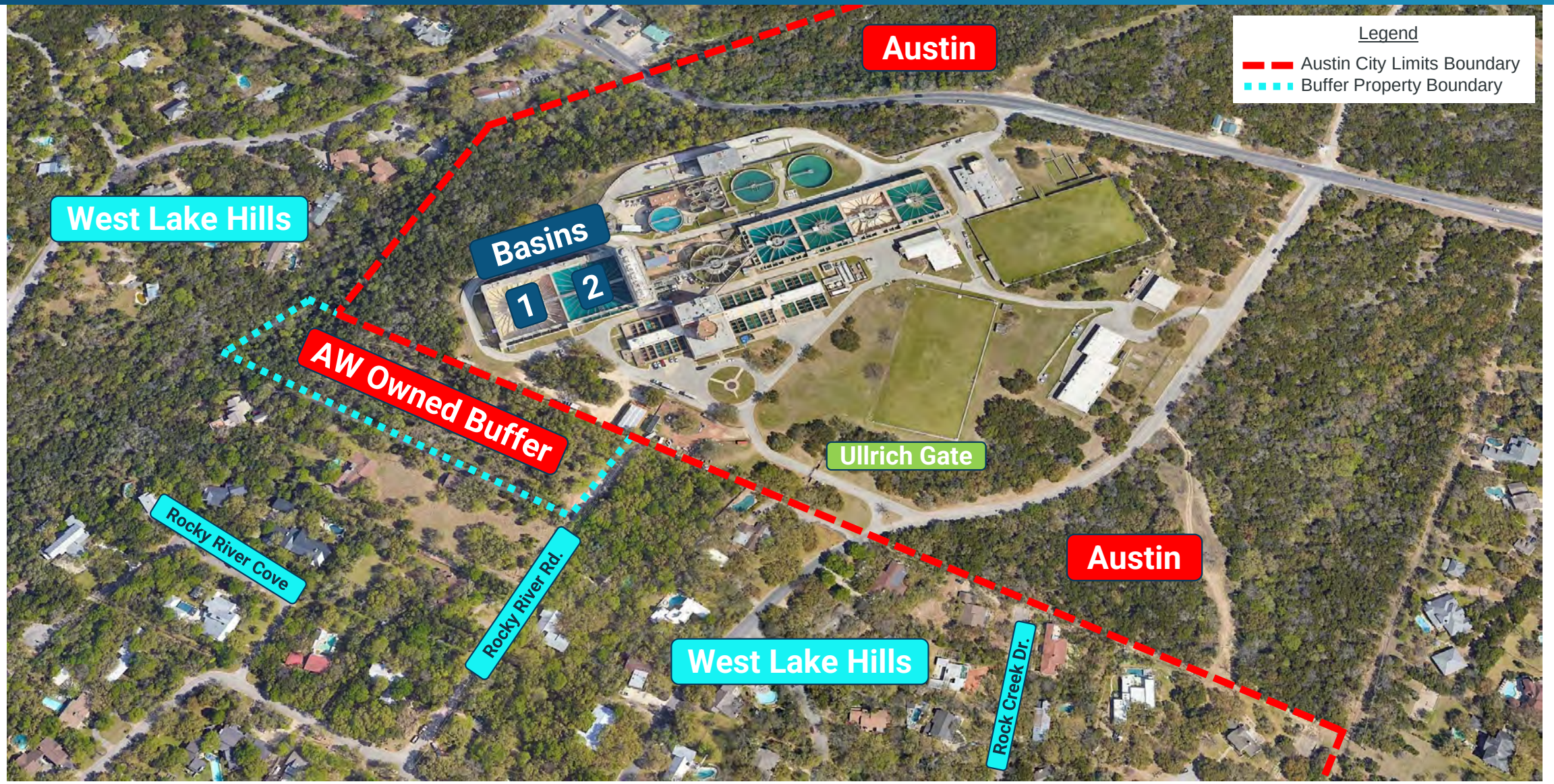
Sound in the atmosphere:

- Attenuates with distance
- Propagates best downwind
- Reflects off solid surfaces
- Is only slightly reduced by vegetation
- Is moderately reduced by walls
- Some sound will curve over walls (especially low-frequency sounds)

Sound can be reduced by:

- Sound absorption on reflective surfaces
- Noise barriers
- Equipment treatments (like silencers)

Site Aerial Showing City Limits Between Austin and West Lake Hills



Noise Criteria

1

State of Texas

Noise limit of 85 decibels

2

City of Austin

Residential property-line noise limit of 70 dBA for mechanical equipment

3

City of West Lake Hills

Property-line limit uses a 1960 Standard octave bands that can no longer be measured and are based on Noise Criterion (NC) curves intended for inside residences

Normal Operations and Sounds at Ullrich

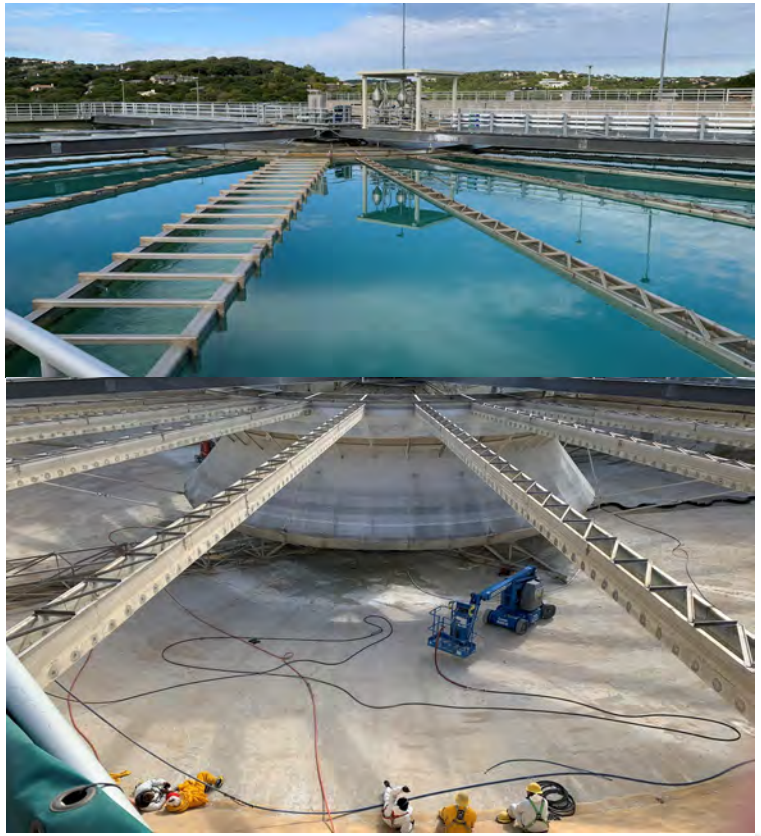
- Small motors are used for mixing and stirring of basins and for pumps

- Weekday morning lime delivery
  - Truck-mounted blowers used until November 2022 to unload lime to storage silos
- Interior lime blower in the Lime Building is much-quieter

- There is a waterfall for water flowing out of each basin

- Trucks remove sludge from facility
- Back-up alarms and general maintenance and construction activities occur during the daytime on weekdays

Basin Cleaning Operation - Necessary on each basin every several years

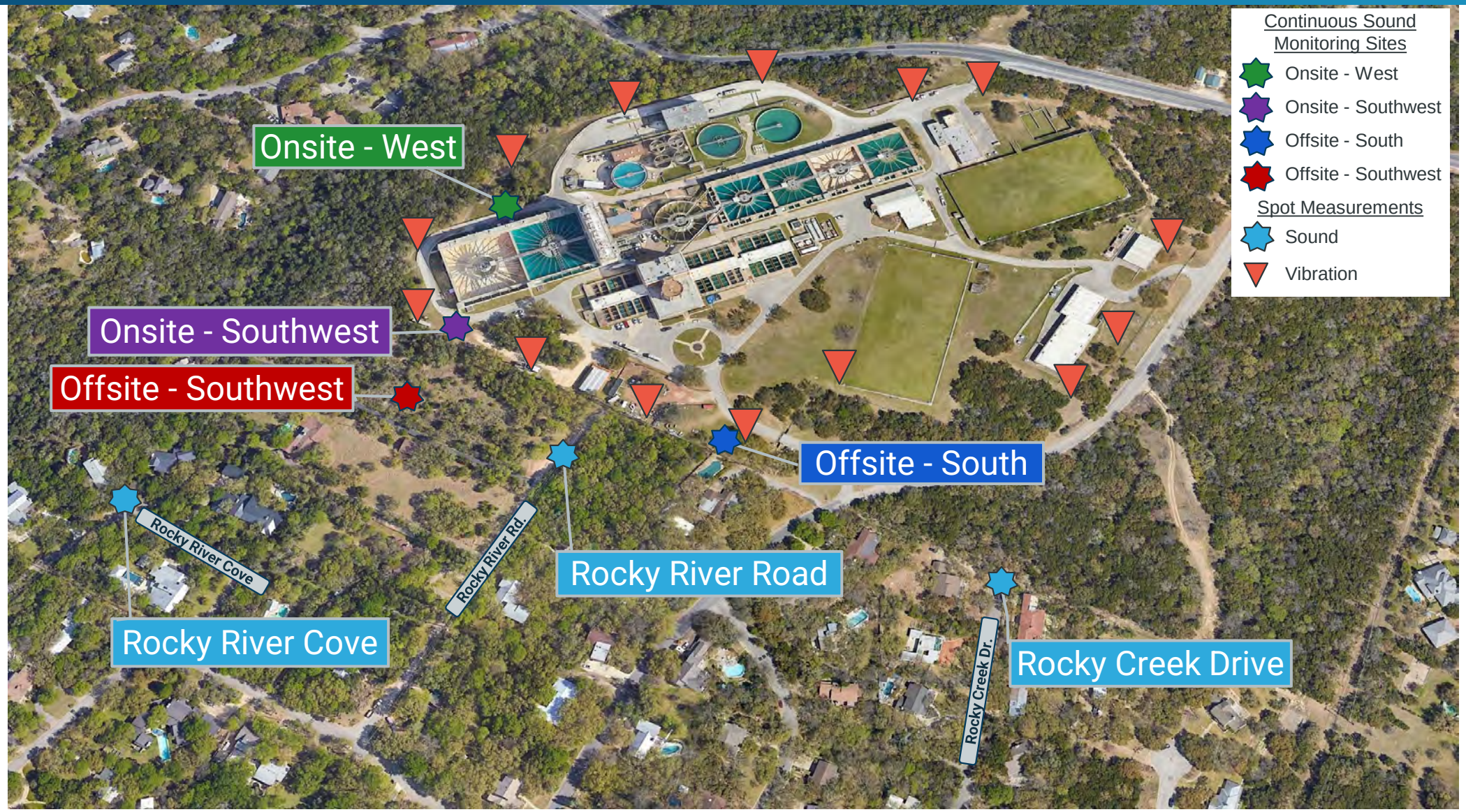


Water is sprayed at high pressure to remove lime scale from basin surfaces

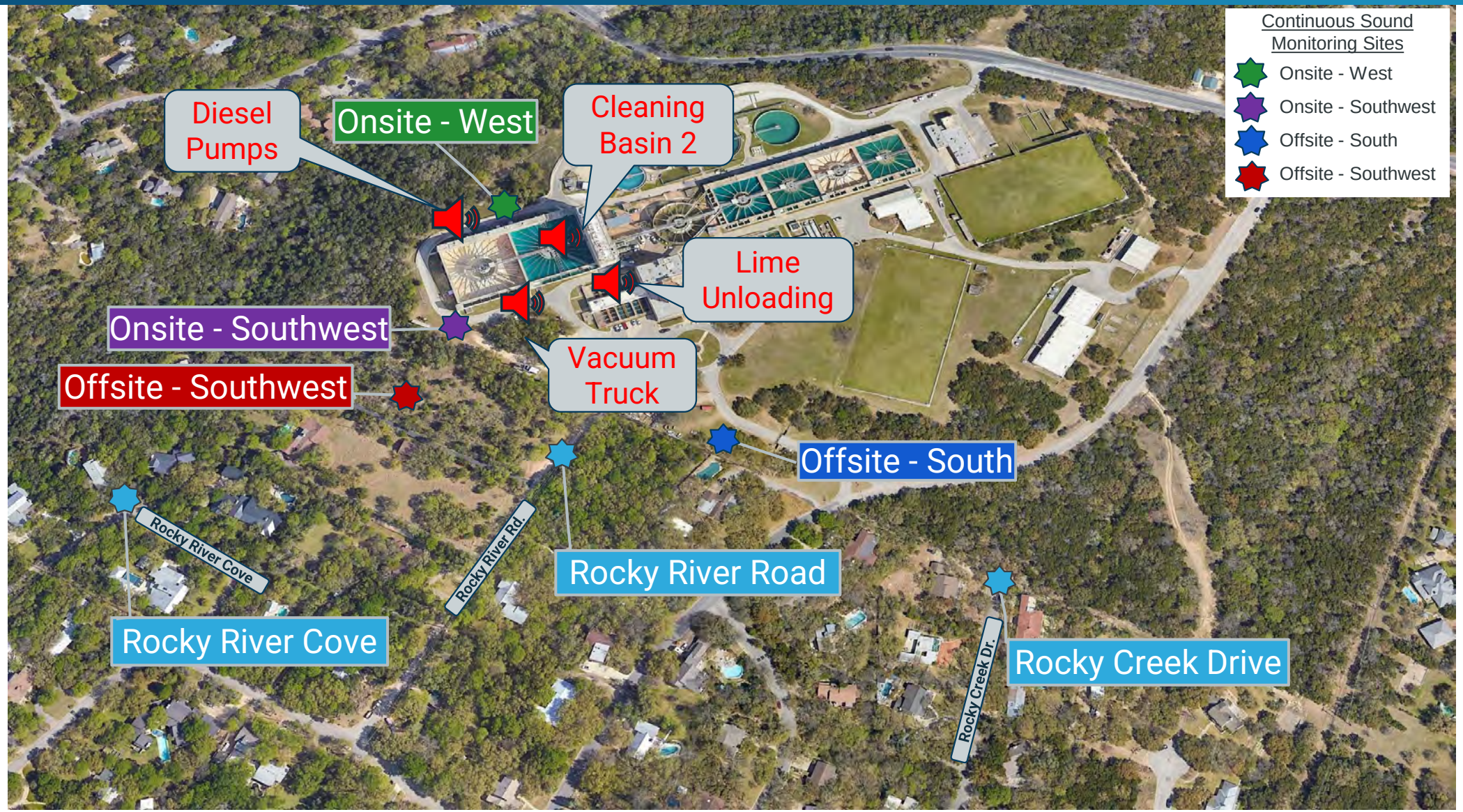
Water is pressurized with diesel-powered pumps (up to 4 running at a time)

The water and scale residue are then vacuumed from the bottom of the basin using a truck-mounted vacuum

Map of Main Measurement Positions



Map of Main Measurement Positions and Noise Sources



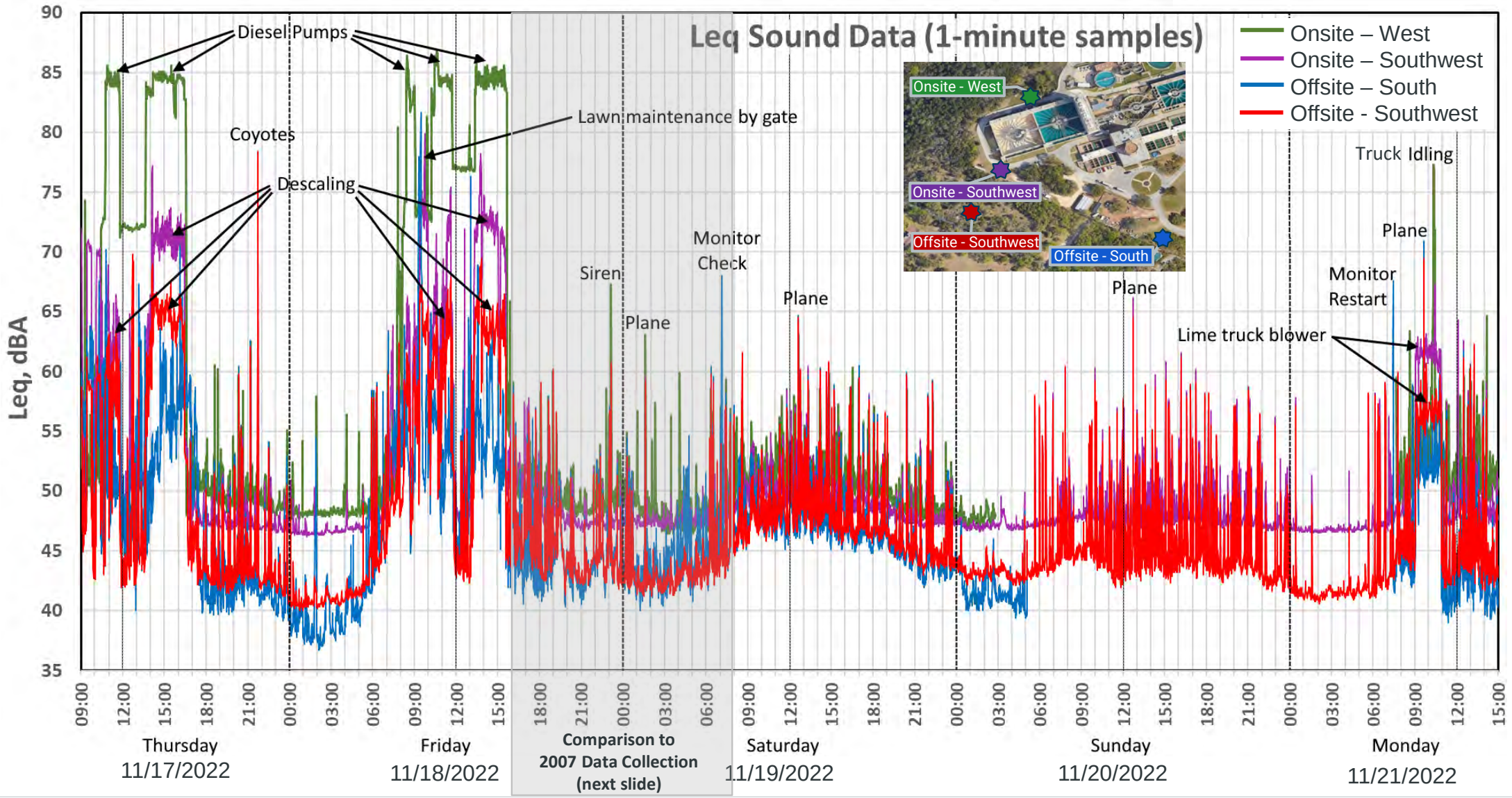
Summary Table of Sound Levels for Different Operations

Condition:	Site						
	Onsite - West	Onsite - Southwest	Offsite - South	Offsite - Southwest	Rocky River Rd	Rocky River Cove	Rocky Creek Dr
	Sound Levels, dBA						
Normal Operations (ambient)	48	47-48	38-43	41-43	38-40	35-42	36-40
Lime Loading w/ truck mounted blower	-	62	53	57	52	45	-
Lime Loading w/ indoor blower	-	50	41	47	<47	<41	-
Basin Cleaning, diesel pumps	85	-	-	-	-	-	-
Basin Cleaning, vacuum truck	-	71	<54	63	52	45	-
Basin Cleaning, hydroblasting	-	70-73	55-60	63-66	52-54	46	-

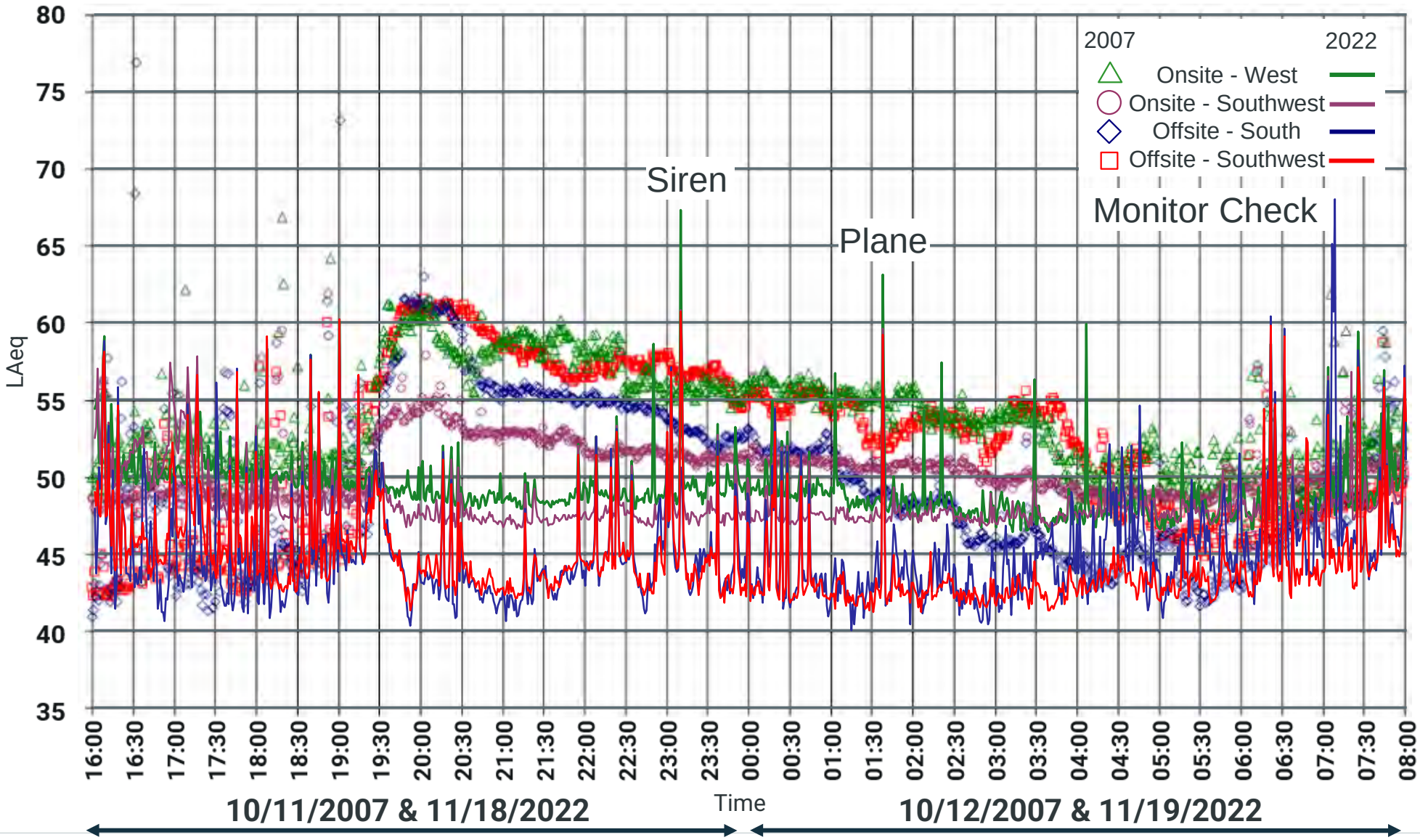
Site Summary

- Onsite - West (Near diesel pumps)
- Onsite - Southwest (Fence by Basin 1)
- Offsite - South (near Ullrich Gate)
- Offsite - Southwest (in buffer zone)
- Rocky River Rd (North end)
- Rocky River Cove (On road by Site 5)
- Rocky Creek Drive (North end)

Summary of 2022 Sound Monitoring Data



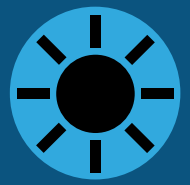
Sound Monitoring Data Comparison 2007 vs 2022



- 2007 = symbols
- 2022 = line plot
- 2022 data plotted with the same color for each measurement positions as used in presenting the 2007 measurements
- 2007 data measured sounds at night only

Comparisons of 2007 Monitoring Data with 2022 Data

2007 data was for night only (4 pm to 8 am each night)



2022 data was taken continuously to cover both day and night, capturing normal plant operations noise levels

2007 data was in October, and there was insect noise at night

2022 data was in November during cool weather without insect noise

Measurements from 2007 and 2022 both show brief, loud sounds, primarily from aircraft

2022 data includes basin cleaning operations

Proximity from Residences to Onsite Measurement Position

Sound in the Community

Sound levels attenuate in the community due to:

- Distance to the residences
- Shielding from buildings and topography
- Effects of foliage and ground absorption

Sound Attenuation Effects of Distance and Shielding

	dBA at 30 ft	dBA at Offsite Southwest	% Reduction in Sound Energy	% Perceived Reduction in Sound Level
Basin Cleaning	100	66	99.96%	90.5%
Vacuum Truck	90	63	99.80%	84.6%
Truck Blower	92	57	99.97%	91.2%
Indoor Blower	80	47	99.95%	89.8%

Adding trees in the buffer can affect the visual shielding but will not affect the sound propagation

Ground Vibration Criteria

- The City of Austin limits earth-borne vibration at a residential area boundary line according to the displacements listed in the adjacent table

- The City of West Lake Hills has a vibration limit of 0.002 g peak measured at any point beyond the lot line

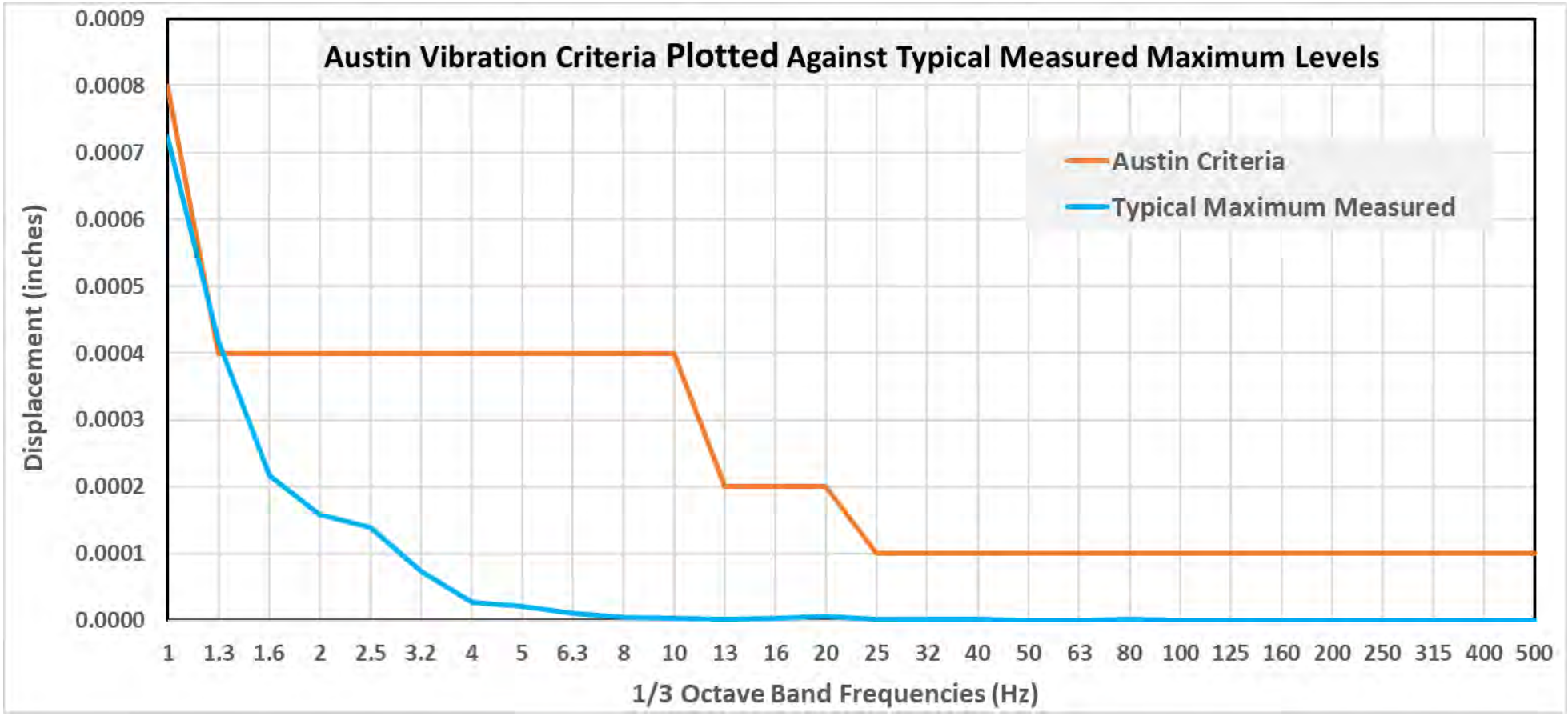
City of Austin Vibration Limits	
Frequency (Hz)	Displacement (in)
0 to 1	0.0008
1 to 10	0.0004
10 to 20	0.0002
20 to 30	0.0001
30 to 40	0.0001
40 and over	0.0001

Map of Ground Vibration Measurement Positions

Measurements were made in the X, Y, and Z axis on a metal object on the ground such as a pipe, shipping container, or similar structure.

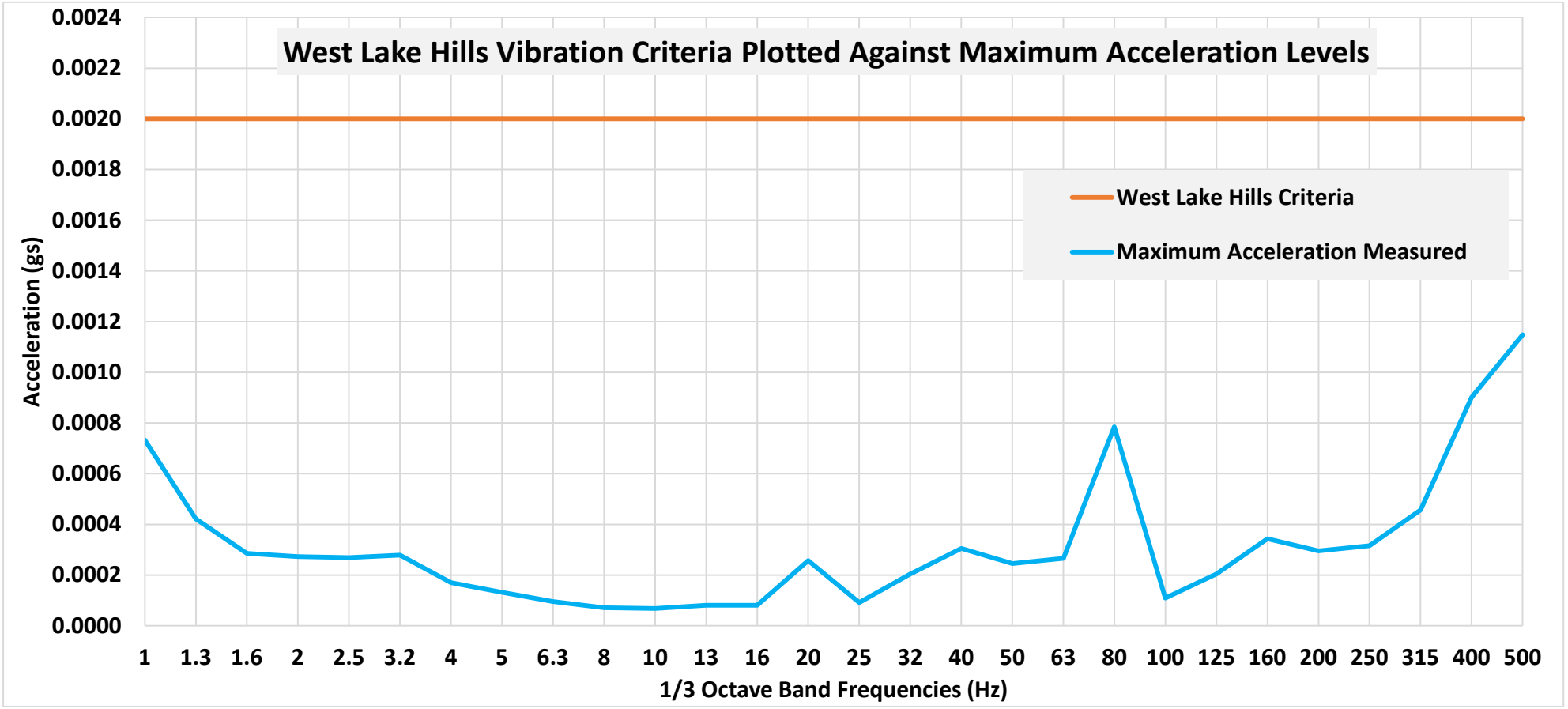
Ground vibrations were not tangible (noticeable) at any location.

Ground Vibration Measurements Compared with Austin Ordinance



- The plotted typical data represents ground vibration measurements made at 14 positions at the site perimeter.
- The residences are further away from the site and will have lower ground vibration levels.

Ground Vibration Measurements Compared with West Lake Hills Ordinance



- None of the ground vibration measurements were found to exceed the West Lake Hills Ordinance

Project Summary

Typical sounds from the Ullrich facility measured at the buffer (Offsite Southwest) ranged from 42 to 66 dBa
Austin noise limit is 70 dBA

The indoor lime blower reduced the noise of the lime truck unloading operation by about 10 dBA to 12 dBA
Functionally, this represents a 50% reduction in perceptible sound and a 90% reduction sound energy

The Ullrich facility meets all applicable noise and vibration ordinances,
and Austin Water's next steps on this project will assess methods to reduce sound further

Feedback

- **What type of noise (or time of day) is most disruptive to you and your household?**

- Please type in the chat to give us feedback.
- You can send a chat to all attendees or send a private chat to the host and panelists.

Sound Study Update Q&A

How to Ask a Question

- **By phone:**
  - Press *9 if you'd like to speak.
  - Once you hear the prompt, press *6 to unmute and speak.
- **Online:**
  - Submit questions or comments in Q&A

Thank you for attending.

- Call **512-972-1000** to report concerns at the plant, such as noise.

- Sign up to receive updates by email at **austintexas.gov/Ullrich**

Community Outreach Contact:
Emlea Chanslor
512-972-0145
emlea.chanslor@austintexas.gov