SCHOLL BIOGAS RENEWABLE GENERATION PROJECT

City Council

September 2022

City of Glendale Water & Power

Your Trusted Community Utility

Today's Decision Points

1. **Authorize a Full Notice to Proceed to Western Energy Systems for the Power Island Major Equipment (PIME) and supplemental services.**

2. **Authorize and award to ACCO for the EPC scope of work.**

3. **Resolution of appropriation of funds for the balance of work.**

Project Scope

Western Energy Systems Scope

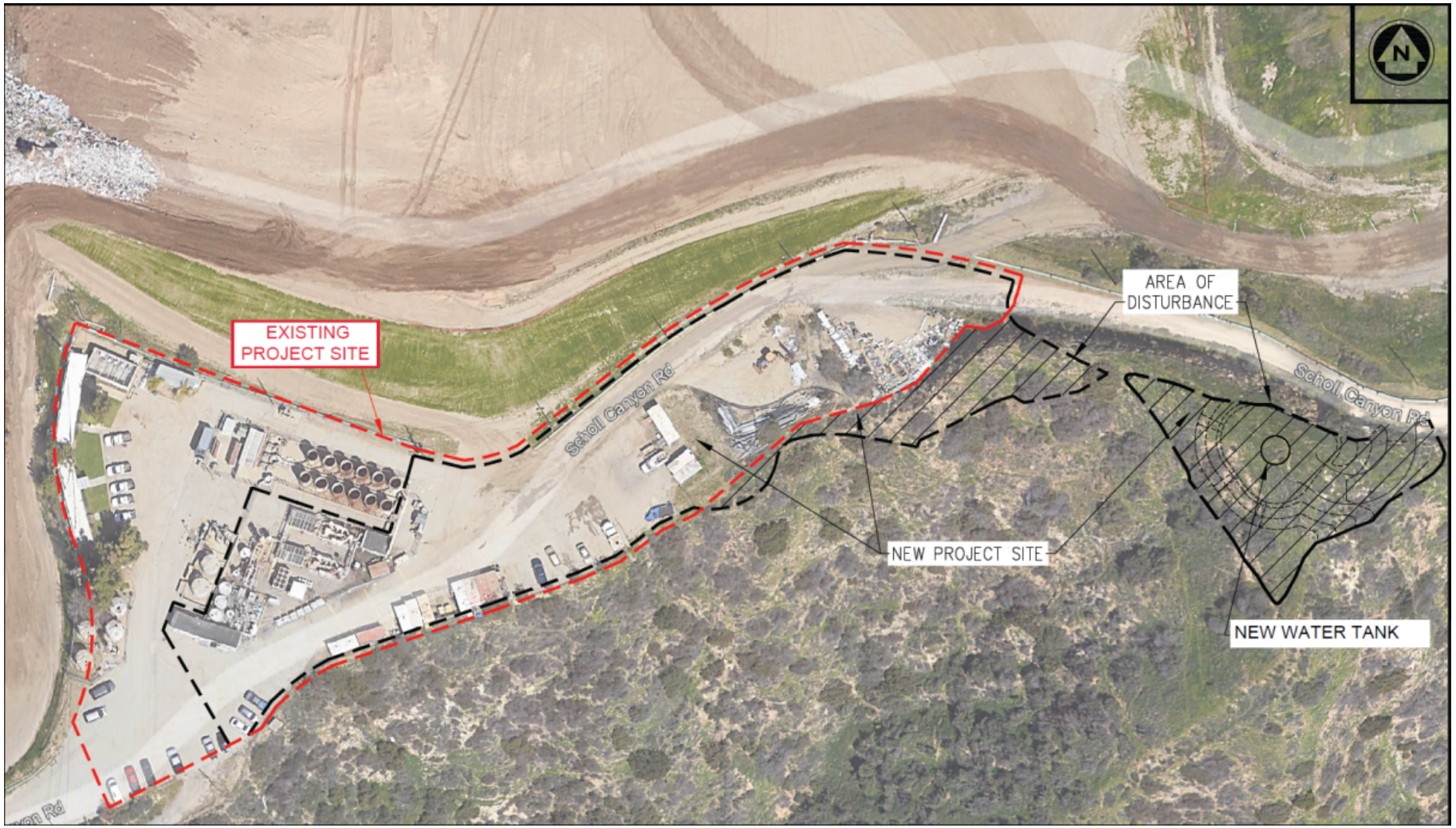
- Four Jenbacher LFG Engines generating 3 MW gross each (11MW net).
- Assembly/reassembly of the engine modules.
- Supply engine support equipment such as coolers, natural gas compressors, etc.

ACCO Scope

- EPC for the balance of plant (BOP) equipment: LFG clean up, LFG compression, electrical connections, etc.
- Heavy lift services for the Jenbacher engines.
- BOP engineering, BOP construction, and startup of the plant.

Existing Scholl Site

New Project Area of Disturbance



Project Schedule

Milestone	Date
City Council approval to move forward	September 20, 2022
FNTP to Western Energy Systems	September 23, 2022
FNTP to ACCO	October 31, 2022
Receive finalized SCAQMD Permit	November 2022
Mobilize to site	January 2023
Project Substantial Completion and Commercial Operation	June 2024
Final Completion	August 2024

Project Financials

- Current Estimated Project Cost: $62.4M (excluding contingencies).
- Current estimated cost for delay is substantial (on the order of +$12.1M).
  - $2.3M: Price increase for the Jenbacher Engines.
  - $9.8M: Replacement energy.
    - This adds a summer to the project schedule.
- Anticipated annual O&M costs range from $2.5M-$3M.

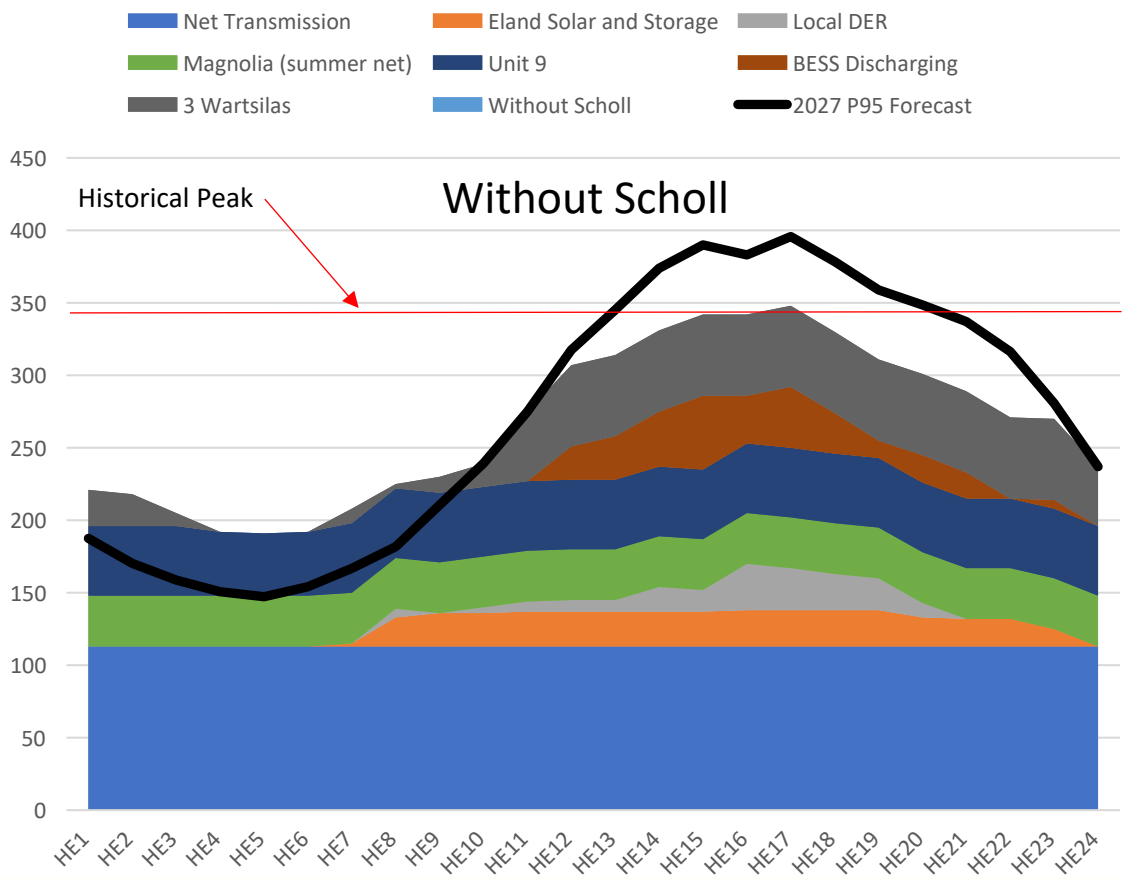
Comparative Hypothetical Projects for Generation

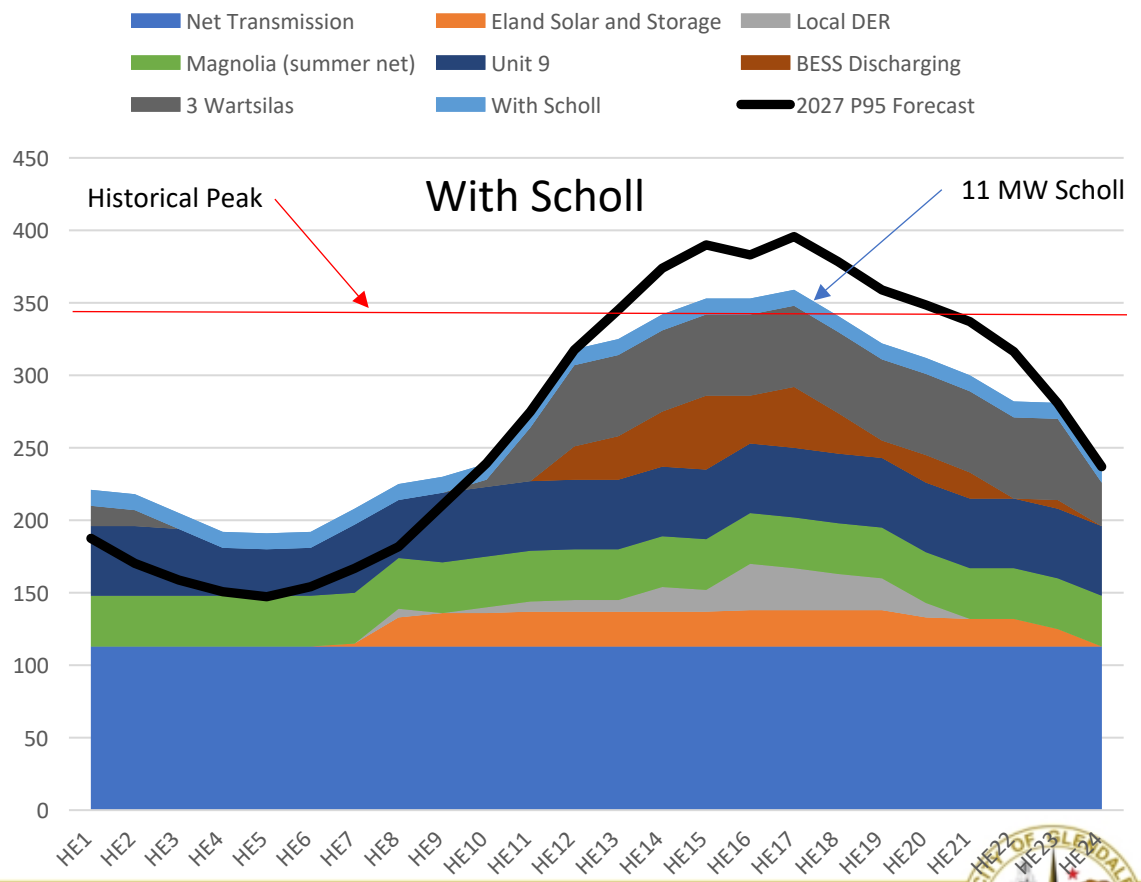
- Local Solar + Battery Storage (***Cost: $248M***)
  - ≈262 MWh Battery Energy Storage System
  - 44MW Utility-Scale Solar PV Generation.
  - Cost of land, BESS augmentation, and O&M excluded from estimate.
    - Land footprint of about 200 - 250 acres
- Wartsila Engine at Grayson (***Cost: $179M***)
  - Assumes 1 Wartsila engine to match Scholl use-case (Baseload).
  - Assumes 24/7/365 operation (minus periodic maintenance).
  - This project would result in higher net emissions by having two emission projects instead of one (NG @ Grayson and LFG @ Scholl).
  - Non-fuel O&M is excluded from estimate
- Renewable Replacement Project (***Cost: $145M***)
  - Power Purchase Agreement + Losses + Transmission Cost over 20 years.
  - The City does not own the asset.
  - Relies on availability of transmission (non-existent).
  - *Not a viable option*

GWP Power Supply Challenges

- Increasing load due to transportation and building electrification
- Grayson Repower reduced to 3 Engines
- Sunrun terminated virtual power plant offer
- Underperforming Demand Response program
- Grid-scale renewable project delays
- Relying on LADWP is not a realistic solution
  - GWP is solely responsible for its capacity, energy, and reserves obligations
- Additional transmission is not a viable option
- Glendale's accelerated goal to achieve 100% Clean Energy by 2035
  - Senate Bill (SB 100): 60% Renewable by 2030 and 100% zero-carbon by 2045
- Soaring cost of energy especially during extreme heat events

IRP Resource Stack Comparison with/without Scholl (N-1-1 Condition)





Scholl Project Benefits

- Mitigates LFG that will be produced even when Scholl is closed.
- Beneficially utilizes LFG that is wastefully being flared.
- Provides up to 11 MW (net) of local energy not subject to intermittency.
- Reliable local generation which is not dependent on transmission.
- Qualifies for renewable energy credits.
- Satisfies up to 9% of the City's renewable obligation.
- As confirmed by the Glendale fire chief, this project lowers wildfire risk in the area.
- Adding a 24/7 generation asset directly helps with GWP electrification goals:
  - Additional nighttime capacity for charging.
  - Daytime capacity for residential usage.

Methane Concentration of LFG of Closed Landfills

Landfill	Shutdown (Year)	% Methane available
Toyon	1989 (33 years)	44
Lopez Canyon	1996 (24 years)	42
Bradley	2007 (15 years)	35
Coyote Canyon	1990 (32 years)	42
Fresh Kills*	2001 (21 years)	60

* - Fresh Kills Landfill is the only landfill utilizing a plastic covering to conserve LFG.

Difference between Puente Hills and Scholl

- Puente Hills (shutdown in 2013): ~32% Methane available (current as of September 2022).
  - Wastewater biosolids were accepted into the landfill, whereas Scholl does not include significant biosolids.
  - There is no plastic liner cover at Puente Hills, whereas Scholl will have a plastic liner cover.
- The sanitation district still uses two boilers to produce 23MW of renewable energy.
  - This is achievable by supplementing the boilers with NG.

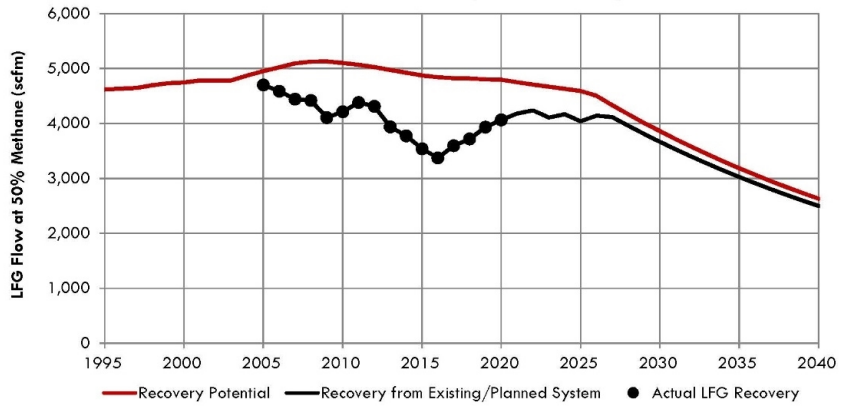
Conversion to full Natural Gas Usage is Not an Option

- This project cannot be converted to full NG usage in the future for the following reasons:
  - The SCAQMD restricts the usage of NG to 10% for this facility.
  - The EIR also restricts NG usage under CEQA.
  - The current design does not allow for the volume of needed NG to the site.

Expected Scholl Landfill Energy Output

APPENDIX B: WASTE DISPOSAL AND LFG RECOVERY ESTIMATES

EXHIBIT 6. LFG RECOVERY PROJECTION - BASELINE SCENARIO:
SCHOLL CANYON LANDFILL, LOS ANGELES, CA



Full year after start up	Callendar Year	# of Engines Operating	Gross Mw Generated
1	2024	4	12
2	2025	4	12
3	2026	4	12
4	2027	4	12
5	2028	4	12
6	2029	4	12
7	2030	4	12
8	2031	4	11.9
9	2032	4	11.6
10	2033	4	11.2
11	2034	4	10.5
12	2035	3	9
13	2036	3	9
14	2037	3	9
15	2038	3	9
16	2039	3	8.8
17	2040	3	8.4
18	2041	3	8
19	2042	3	7.7
20	2043	2	6

Project will continue producing energy beyond 2043

In Conclusion:

- Due diligence was done by GWP personnel/team members to ensure that this is a good financially–appropriate AND environmentally–conscious project for the City.
- This project aligns with the City's environmental stewardship values and will meet up to 9% of the City's renewable goal.
- This project will provide 24/7/365 LOCAL generation for the city, which is NEEDED for fulfilling the City's present and future electrification goals.
- Adding LFG generation to GWP's energy portfolio will PRODUCTIVELY use the methane that is being produced (rather than just heating the environment).
- A delay in approval is expensive.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Parking Lot Slides

Project Concerns and Due Diligence Completed

- The city has taken the concerns raised for this project seriously, and would like to address them in the following slides:

Scholl Canyon Fire Risk Assessment

- Glendale Fire Chief Silvio Lanzas (retired) had this to say about the project on 11/30/2021:
  - “It is my professional opinion that the proposed biogas project at the Scholl Canyon Landfill is ***safer*** and poses less fire threat than the current flaring operation that has been ongoing since the 1980s.”
  - “I, as the fire chief, will not sign off…and without hesitation, will order the immediate stoppage of any process at this site, or at any other, where I feel the threat to life and property exists.”

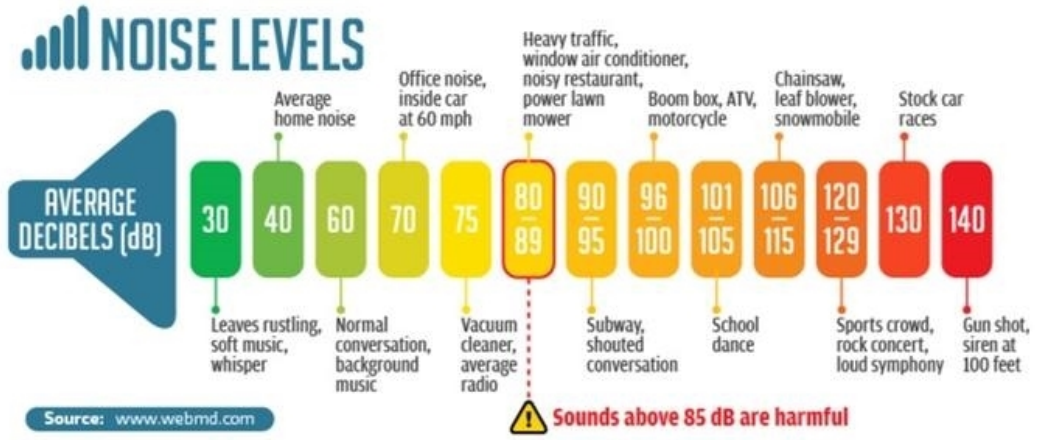
- “My number one mission as the fire chief in this city is the wellbeing of our public and our firefighters; and I will not allow anything that poses a danger to either to come into our city.”

Scholl Canyon Fire Risk Assessment (cont.)

- The following fire mitigation systems are included in this project:
  - Increasing the current brush clearance to allow for a minimum of 100ft clearance around all structures and buildings.
  - Enclosing the engines which will contain the biogas within a structure (i.e. – no open flame exposure to the surrounding area).
  - The structure will include a fire protection system that will activate at the first sign of a fire problem.
  - The office buildings will include a fire sprinkler system.
  - The power distribution center will include a NFPA-compliant fire protection system.
  - The 60,000-gallon water tank will have fire department connections and is solely available for fire suppression use.
  - Fire extinguishers and fire suppression hoses will be throughout the facility.
  - Fire alarms throughout the facility.
  - Separation within the engine enclosure building which will isolate a fire danger and minimize its spreading from engine to engine.

Scholl Canyon Noise Assessment

- To ensure that noise will not be a problem for the residents, the shown noise study was performed:



Scholl Canyon Noise Assessment Results (cont.)

	Address	Distance from Project Site	Receptor Start Time	Receptor Finish Time	MinL (dB)	MaxL (dB)	Leq (average dB)	Noise Study Result (db)	Projected Resultant Exposure (dB)
Receptor 1	5471 Mount Helena Ave.	2,389	10:52	11:07	49.1	59.9	54.0	38.0	54.1
Receptor 1	5471 Mount Helena Ave.	2,389	22:22	22:37	50.5	73.5	56.8	38.0	56.9
Receptor 2	1233 Cedarredge Ave.	3,033	11:14	11:29	60.1	75.0	65.2	40.0	65.2
Receptor 2	1233 Cedarredge Ave.	3,033	22:43	22:58	59.3	69.0	64.3	40.0	64.3
Receptor 3	Corner of Patircan & LaMirada	2,970	11:45	12:02	41.5	67.1	54.5	40.6	54.7
Receptor 3	Corner of Patircan & LaMirada	2,970	23:15	23:30	41.9	64.6	47.8	40.6	48.6
Receptor 4	1600 Glen Oaks Blvd.	2,607	12:19	12:34	32.8	47.0	37.1	35.2	39.3
Receptor 4	1600 Glen Oaks Blvd.	2,607	23:42	23:57	36.6	67.2	47.1	35.2	47.4
Receptor 5	Corner of Figueroa & Marengo Dr.	4,271	13:15	13:30	29.1	62.8	43.4	35.1	44.0
Receptor 5	Corner of Figueroa & Marengo Dr.	4,271	0:40	0:35	35.1	46.4	39.1	35.1	40.6
Receptor 6	2840 Glenoaks Canyon Rd.	2,281	14:17	14:32	35.4	63.6	46.4	29.9	46.5
Receptor 6	2840 Glenoaks Canyon Rd.	2,281	0:53	1:08	43.5	53.5	46.5	29.9	46.6

Earthquake Concerns & Seismic Design

- All structural calculations and drawings shall be prepared and stamped by a registered California Civil or Structural Engineer (taking into account all loading information including dead, live, wind, seismic and any other sustained or transient loads).
- All equipment, structures and retaining walls shall be designed for wind and seismic forces per 2019 California Building Code requirements with Risk Category III classification under ASCE 7-22 guidelines.
- All load combinations for anchor bolts shall be per ASCE 7-22, Section 2.4 (ASD) for seismic load combinations.
- All structural and miscellaneous steel design shall be in accordance with the requirements of AISC Specification 360 “Specification for Structural Steel Buildings” and the AISC 341 “Seismic Provisions for Structural Steel Buildings”.

Hazardous Materials

- Landfill gas lines and fuel conditioning systems are already in place and must remain in place even without the project.

Air Pollution

- Health Risk: SCAQMD reviewed the health risk assessment for both CEQA and its permitting program and agrees that health risks attributed to the project are less than significant.
- Methane Destruction Efficiency: When combined with oxidation catalysts, the Scholl Canyon engines are expected to remove 99.92% of methane emissions. This is a difference of just 0.04% when compared with flares.

Recreation Use Concerns

- Regardless of the project status, an industrial footprint will remain on site for landfill gas collection system maintenance, gas processing, and gas incineration.
- A dispersion and air quality assessment was conducted to determine potential impacts on recreational use. The analysis shows that a buffer of 100 meters would generally accommodate impacts, regardless if this project moves forward due to the present flaring occurring on site.
- The impacts are related to 24-hr PM10 emissions and, to a lesser extent, 1-hr NO2 emissions. Both pollutants would be emitted from flares in the absence of the project and the flares would require a similar buffer zone. In fact, the lower exhaust velocity of flares may lead to higher nearby ground-level concentrations of pollutants.

Costs Associated with Project Delay

- In 2021, the total project projected costs was approximately $43M.
- The current expected cost increase is $2.3M for a three-month delay.
- Replacement cost of $7M per year, which would equate to approximately an average rate increase of 2.5% over 20 years.
- Significant uncertainty:
  - Inflation
  - Status of the war in Ukraine
  - Re-permitting
  - Potential re-bidding

Financial Details

- Western Energy System Cost: $17,729,194
  - *excludes +10% contingency*
- ACCO Cost: $43,637,098
  - *excludes +15% contingency*
- Miscellaneous support costs: $1,000,000
  - *no contingency requested*