NEEL-SCHAFFER
Solutions you can build upon

MISSISSIPPI Magnolia Chapter SWANA

Case Study: Groundwater Challenges in MSW Landfill Cell Construction

August 2021

SWANA
SOLID WASTE ASSOCIATION OF NORTH AMERICA

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WHERE WE ARE....

DBIA DESIGN-BUILD INSTITUTE OF AMERICA MEMBER

2021 ENR TOP 500 NO. 206 DESIGN FIRMS

38 Offices | 9 States

Alabama | Arkansas | Florida | Georgia | Louisiana | Mississippi | South Carolina | Tennessee | Texas

NEEL-SCHAFFER
Solutions you can build upon

DISCIPLINES & SERVICES

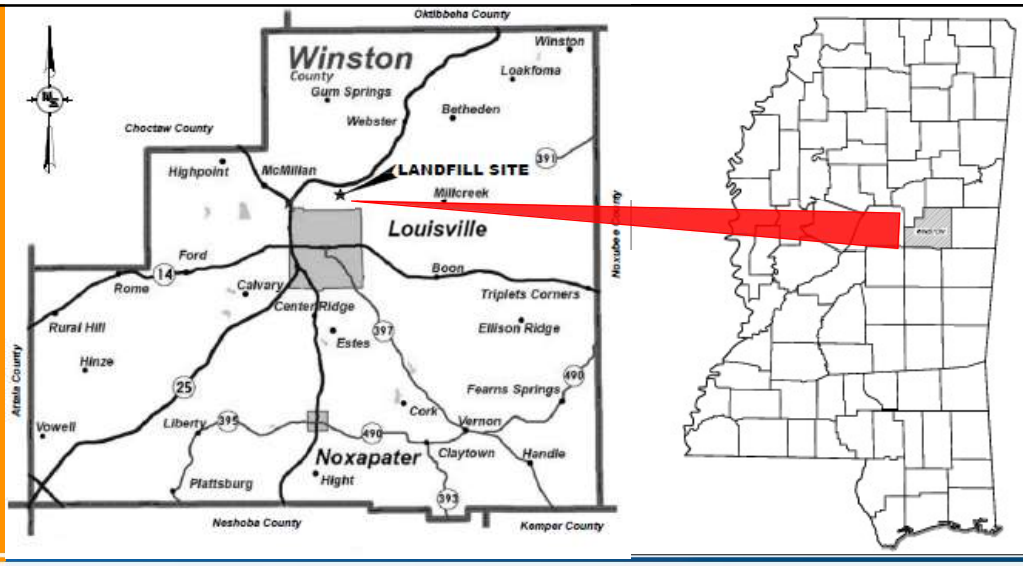
Transportation
- Aviation
- Bridges
- Lighting
- Maritime
- Railroad
- Roads and Highways
- Signage
- Traffic
- Transportation Planning

Environmental Services
- Air Permitting
- Brownfields Assessment/ Redevelopment
- Environmental Permitting/ Compliance
- Natural Resources & NEPA Compliance
- Phase I/II ESA
- Solid Waste
- Under/Aboveground Storage Tank Mgmt.

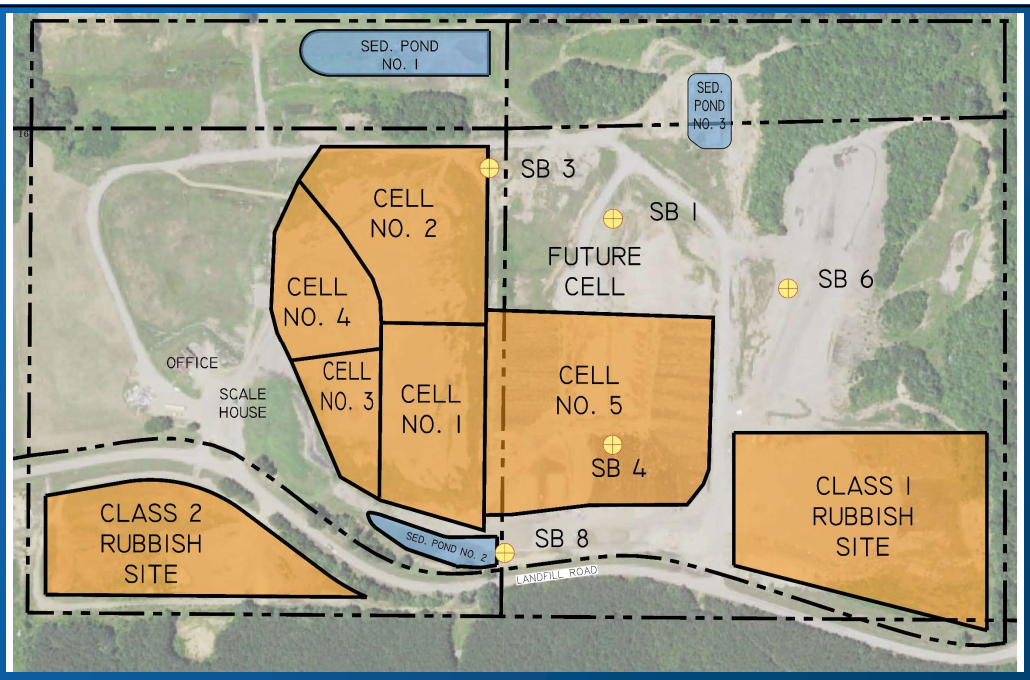
Civil/Site
- Site Development
- Structural Engineering
- Telecommunications
- Multi-use Trails
- Recreational
- Landscape Architecture

Support Services
- Storm Water Management
- Water Resources
- Water Treatment & Conveyance
- Wastewater Treatment & Collection

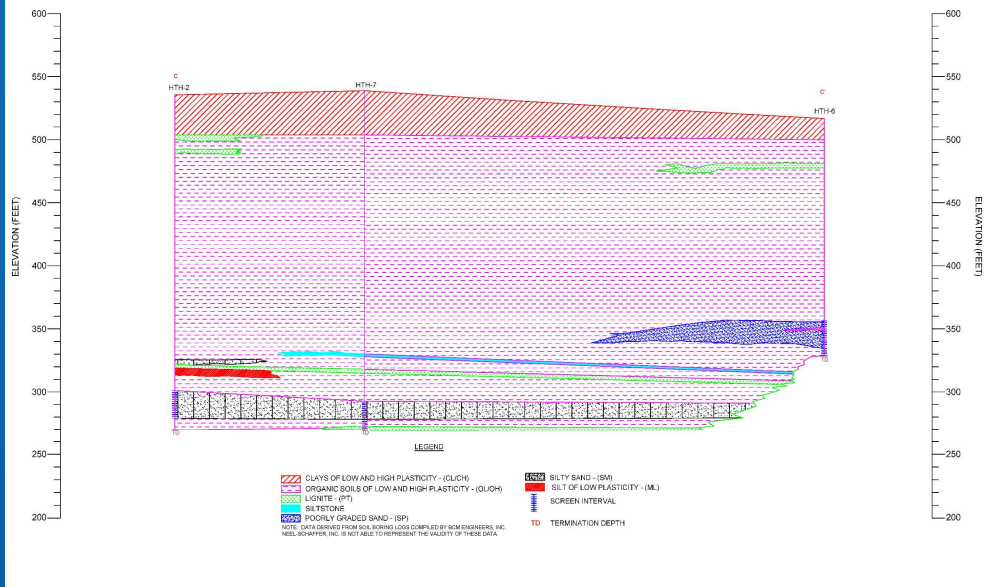
Support Services
- Emergency Management
- Planning Resources
- Surveying
- Construction Engineering & Inspection



City of Louisville -- Winston County, Mississippi



LOUISVILLE – WINSTON COUNTY LANDFILL



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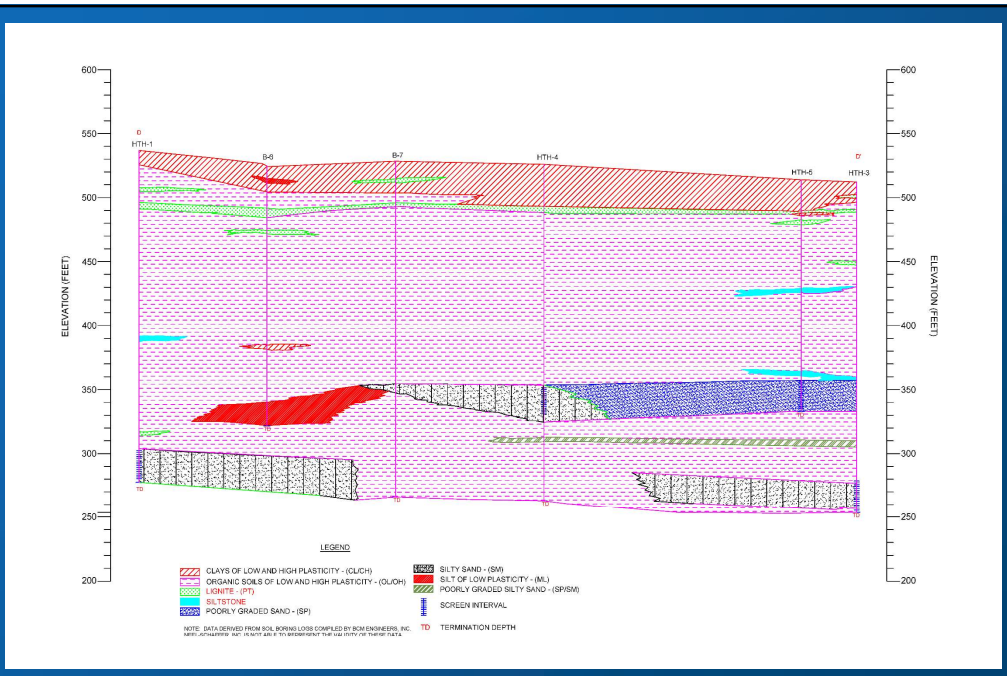
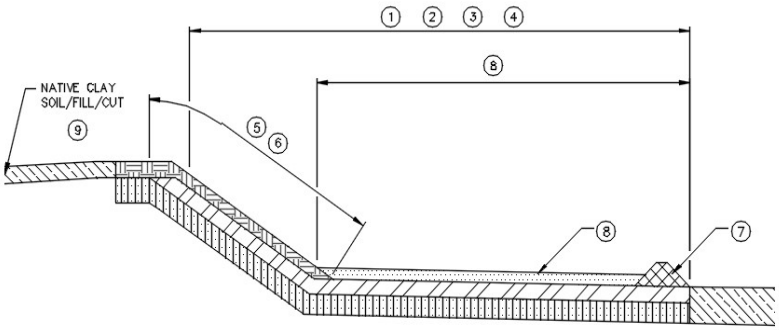


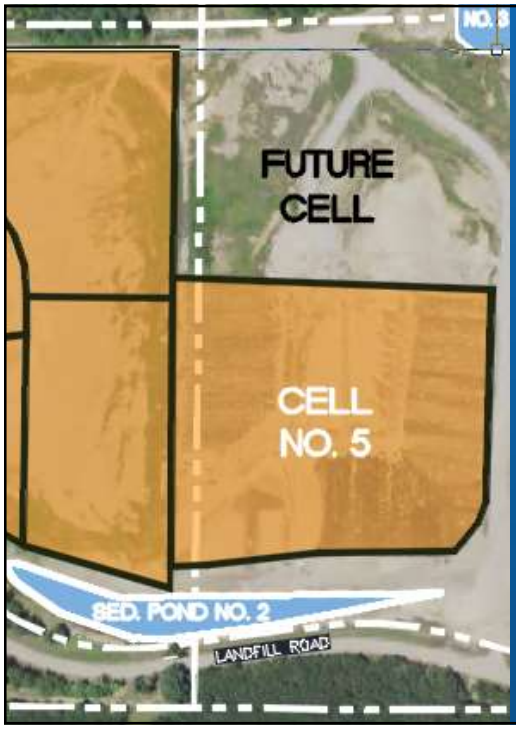
LOUISVILLE – WINSTON COUNTY LANDFILL

LOUISVILLE – WINSTON COUNTY LANDFILL

MSW LANDFILL DESIGN COMPONENTS



SYMBOL	ITEM NO.	ITEM DESCRIPTION
	1	CLAY BUFFER SOIL
	2	RECOMPACTED CLAY LINER
	3	60 MIL HDPE SYNTHETIC LINER
	4	MDOT TYPE VI GEOTEXTILE FABRIC
	5	PROTECTIVE COVER FOR SLOPE
	6	U.V. RESISTANT GEOTEXTILE FABRIC
	7	LEACHATE/STORM WATER BERMS
	8	LEACHATE DRAINAGE MATERIAL (SAND BLANKET / GRAVEL)
	9	NATIVE CLAY SOIL / FILL / CUT



LOUISVILLE – WINSTON COUNTY LANDFILL

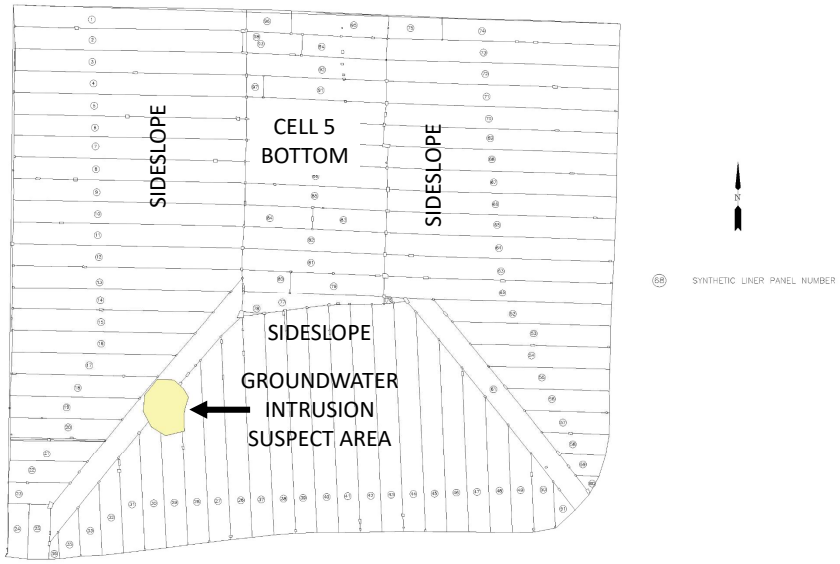
CELL NO. 5 CONSTRUCTION

- AVERAGE BID PRICE $2.0 MILLION
- CELL CONSTRUCTION AREA +/- 7.6 ACRES
- FINAL COST $1.7 MILLION
- COMPLETION DECEMBER 2017
- WAS NOT PUT INTO SERVICE AT COMPLETION IN 2017

SEPTEMBER OF 2019 – 2 YEARS LATER

BOTTOM DRAINAGE LAYER AND SYNTHETIC LINER HEAVED BY GROUNDWATER INFILTRATION

SEPTEMBER OF 2019 – 2 YEARS LATER

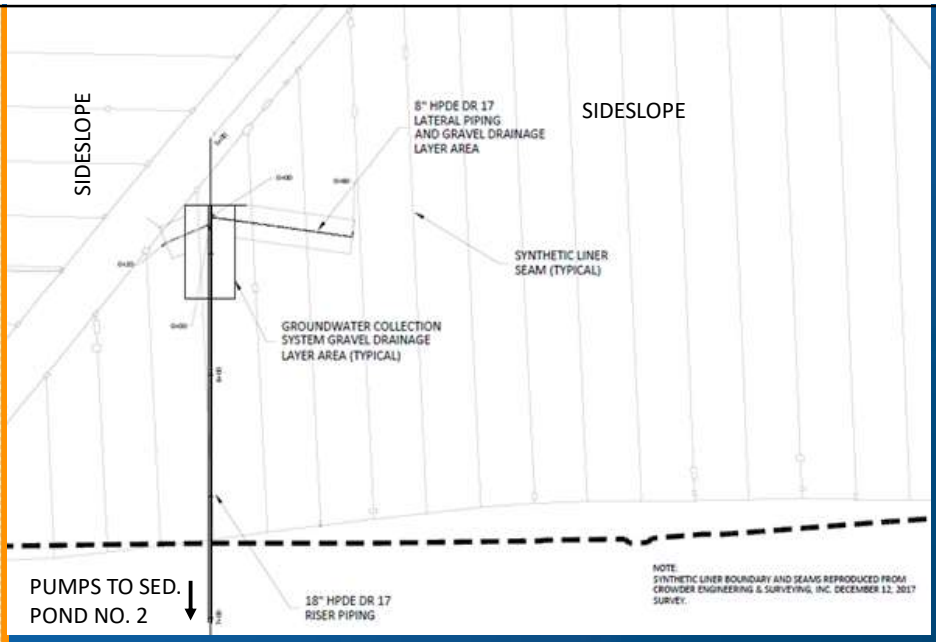


FIRST STEPS TAKEN

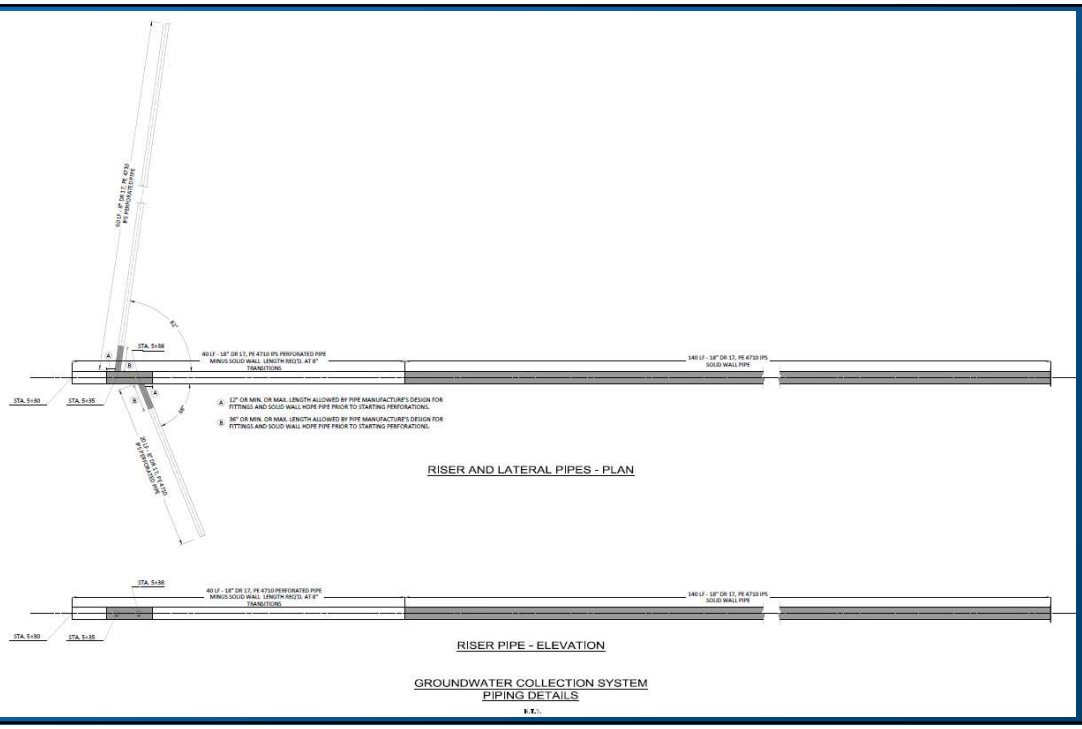
- CITY DECLARED EMERGENCY
- ESTIMATED QUANTITIES DEVELOPED FOR QUOTES TO:
  - REMOVE DRAINAGE LAYER
  - REMOVE SYNTHETIC LINER IN CELL BOTTOM AND SUSPECT AREA ON SIDESLOPE
  - REMOVE CLAY LINER FOR REPROCESSING IN BOTTOM
  - REMOVE PROTECTIVE COVER, SYNTHETIC LINER AND CLAY LINER ON SIDESLOPE AT SUSPECT AREA
- QUOTES SECURED FOR INITIAL WORK WITH LOWEST PRICE AT JUST UNDER $400,000

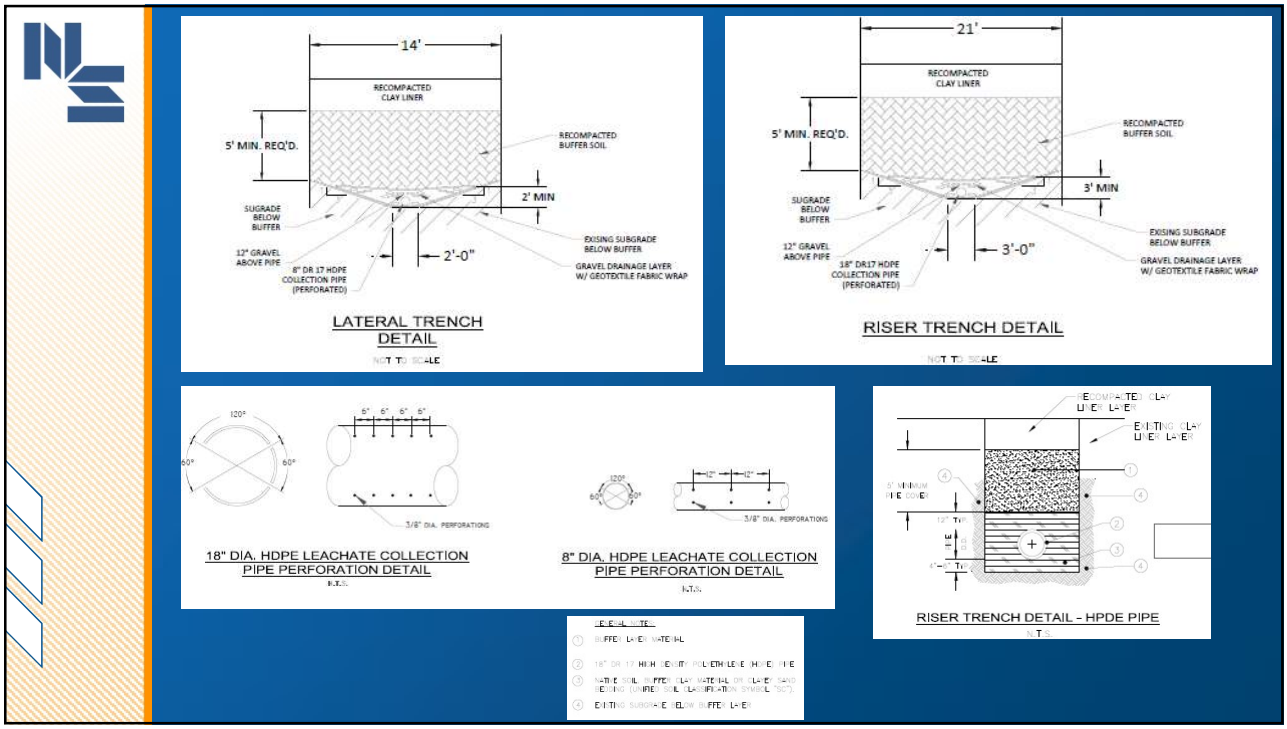
DECEMBER 2019 – SYNTHETIC LINER CUT TO EXPOSE CLAY LINER
*** TOO MUCH WET WEATHER TO TELL ***

MARCH 2020 – SUSPECT
AREA EXCAVATION REVEALAD
GROUNDWATER SEEPAGE



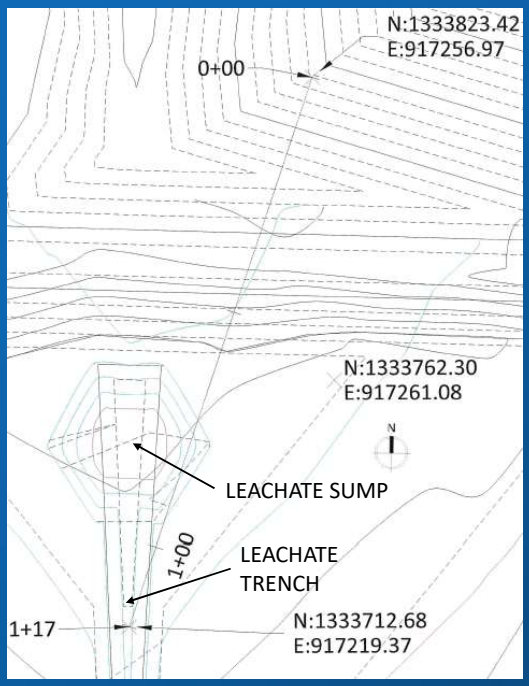
APRIL 2020 - CHANGE ORDER NO. 1 FOR GROUNDWATER COLLECTION SYSTEM ($90,420)



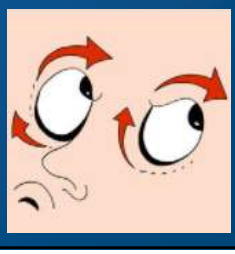


AUGUST 2020 – RECOMPACTED CLAY LINER INSTALLED AND SYNTHETIC LINER BEING REPLACED

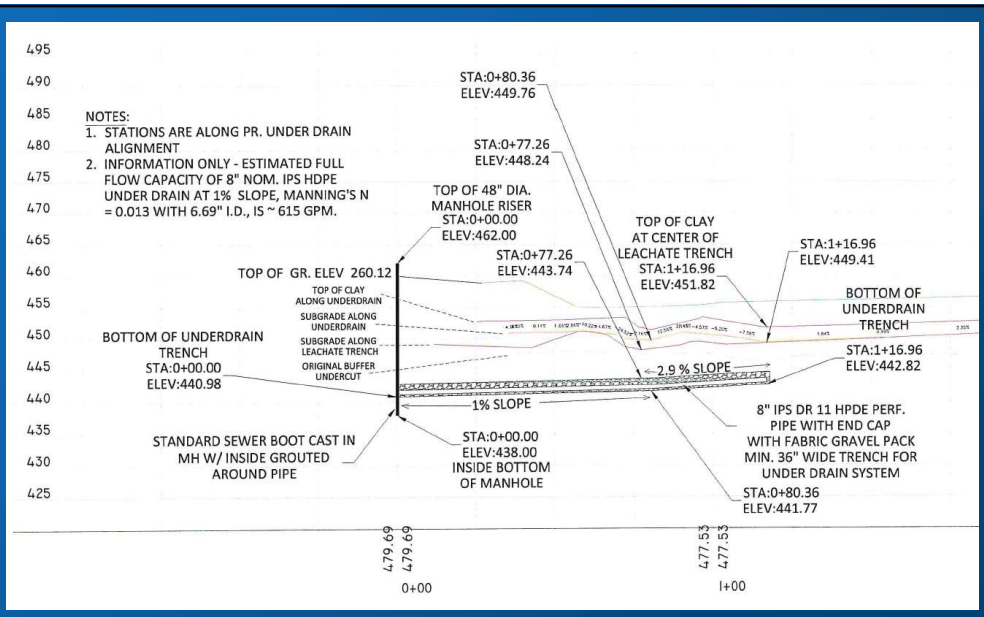
SEPTEMBER 2020 – GROUNDWATER FOUND IN LEACHATE SUMP AND TRENCH



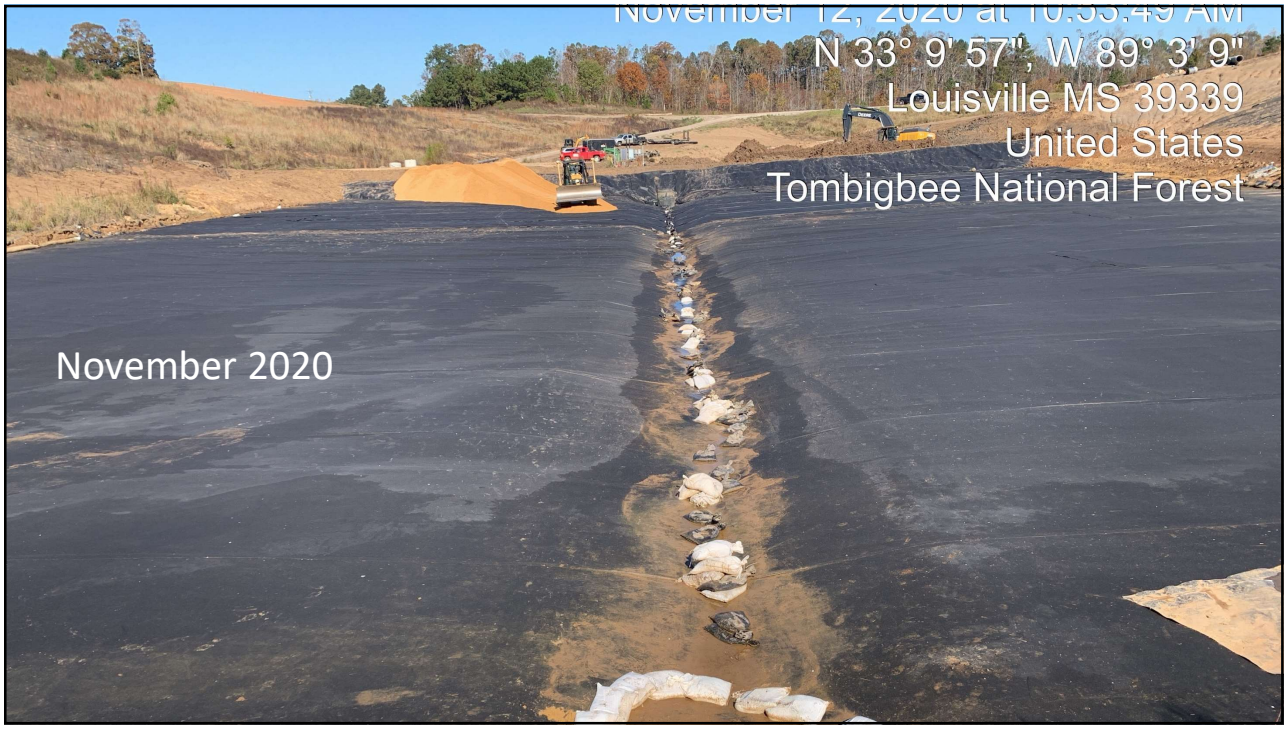
SEPTEMBER 2020 – GROUNDWATER SEEPAGE FOUND IN LEACHATE SUMP AND TRENCH AREAS

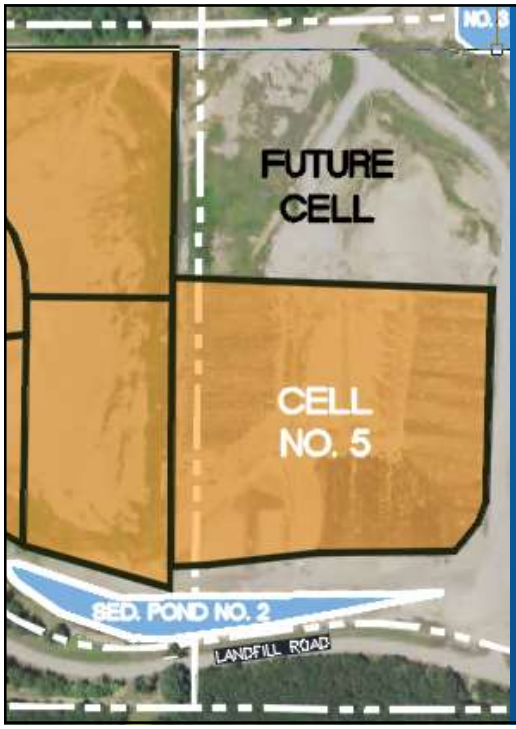


"WILL IT EVER END!"



SEPTEMBER 2020 – GROUNDWATER FOUND IN LEACHATE SUMP AND TRENCH
SOLUTION: UNDERDRAIN SYSTEM IN CELL BOTTOM – CHANGE ORDER NO. 3 ($136,000)





LOUISVILLE – WINSTON COUNTY LANDFILL

CELL NO. 5 RECONSTRUCTION

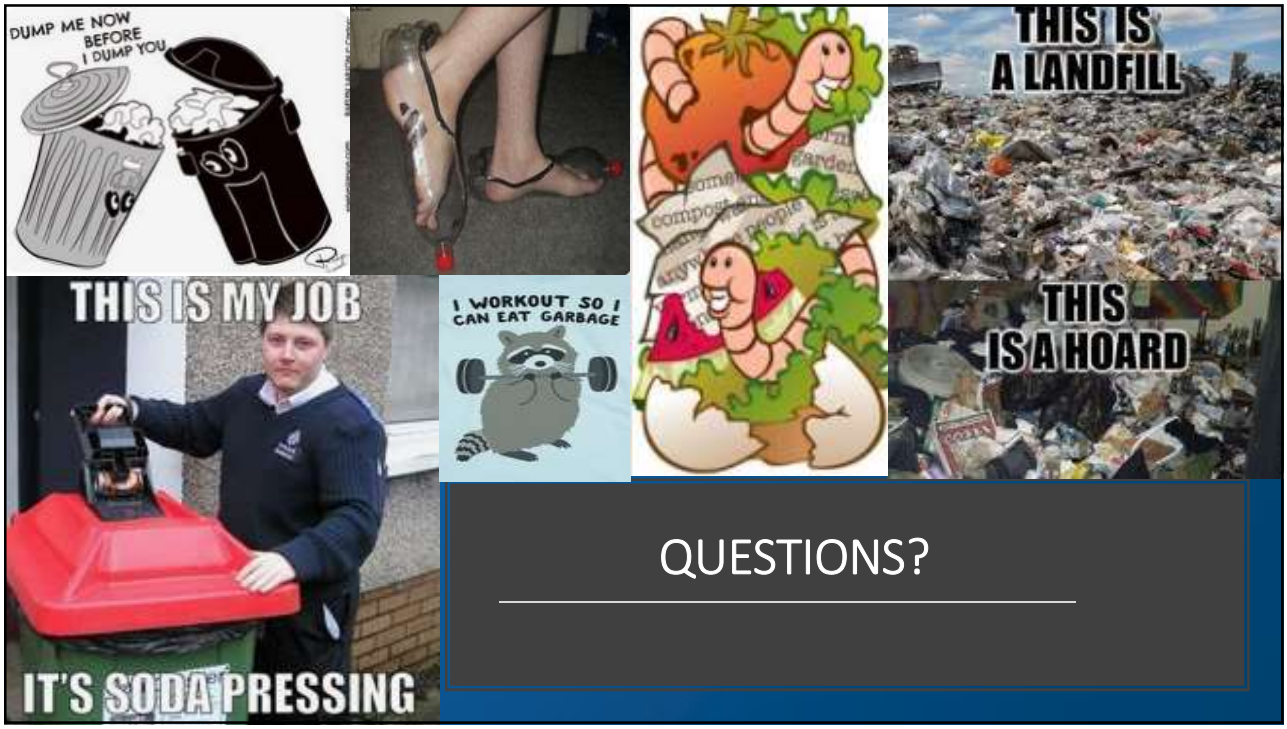
- AVERAGE BID PRICE $2.0 MILLION
- CELL CONSTRUCTION AREA +/- 7.6 ACRES
- 2017 INITIAL COST $1.7 MILLION
- 2020 FINAL COST $2.4 MILLION
- $700,000 INCREASE AFTER INITIAL CONSTRUCTION

LOUISVILLE – WINSTON COUNTY LANDFILL

SOME TAKEAWAYS

- PUT NEW CELLS INTO OPERATION AS SOON AS POSSIBLE ONCE APPROVED FOR USE
- ADDITIONAL GROUNDWATER MONITORING MAY BE BENEFICIAL IN THE FUTURE FOR BETTER LOCATING SOURCES AND DIRECTION OF FLOW
- FUTURE CELL DESIGNS TO CONSIDER GROUNDWATER COLLECTION SYSTEMS

*** SOME COST SAVINGS MAY BE FOUND ON THE FRONT END ***



QUESTIONS?