
Riverview Land Preserve

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2024 State Revolving Fund Project Plan Leachate Treatment Plant



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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AST	Above-ground Storage Tank
BMP	Best Management Practices
cBOD	Carbonaceous Biochemical Oxygen Demand
City	City of Riverview
CFR	Code of Federal Regulations
CS	Condensate Sump
DAF	Dissolved Air Flotation
DUWA	Downriver Utility Wastewater Authority
EGLE	Michigan Department of the Environment, Great Lakes, and Energy
EQ	Equalization
FF	Foam Fractionation
GAC	Granulated Activated Carbon
GLWA	Great Lakes Water Authority
GPD	Gallons per Day
HMI	Human-Machine Interface
IPP	Industrial Pre-treatment Program
IX	Ion Exchange
LFG	Landfill Gas
LFGTE	Landfill Gas-to-Energy
LTP	Leachate Treatment Plant
MNFI	Michigan Natural Features Inventory
MSA	Metropolitan Statistical Area
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards (NAAQS)
ND	Not Detected
NPDES	National Pollutant Discharge Elimination System
PCB	Poly-chlorinated biphenyl
Permit	Class D Wastewater Discharge Permit
PFAS	Poly- and perfluoroalkyl substances

Acronyms/Abbreviations	Definition
PFBS	Perfluorobutane Sulfonate
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
PLC	Programmable Logic Controller
PVC	Polyvinyl Chloride
RLP	Riverview Land Preserve
RNG	Renewable Natural Gas
RO	Reverse Osmosis
SEMCOG	Southeast Michigan Council of Governments
SESC	Soil and Sedimentation Control
SHPO	State Historic Preservation Office
SO2	Sulfur Dioxide
SRF	State Revolving Fund
SUO	Sewer Use Ordinance
THPO	Tribal Historic Preservation Office
TSS	Total Suspended Solids
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

The City of Riverview (City) owns and operates the Riverview Land Preserve (RLP), a Type II sanitary landfill located at 20863 Grange Road in the City of Riverview, Michigan. The RLP provides solid waste management solutions for communities in Wayne, Monroe, Oakland, Macomb, and Washtenaw counties in southeast Michigan as well as customers in Indiana and Canada. The RLP is currently licensed under provisions of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.11501 et seq. (Part 115) for the operation of a municipal solid waste (MSW) landfill. The landfill has been in operation since 1968 and receives, on average, approximately 700,000 tons of permitted waste per year.

Leachate from the RLP is discharged to the Downriver Utility Wastewater Authority (DUWA) via sewer under an Industrial Pollution Prevention program (IPP) Class D Wastewater Discharge Permit (Permit) and subject to the limits therein. Presently, leachate for Outfall 003B is treated for PCB.

In October of 2018, the leachate was identified as a source for per- and polyfluoroalkyl substances (PFAS) contributing to the DUWA treatment plant and the City was directed DUWA to develop and implement a PFAS reduction plan. As a passive receiver of MSW that may contain PFAS, the RLP has limited control over the amounts of PFAS disposed at the landfill. The landfill has and continues to employ Best Management Practices (BMP) to reduce leachate generation.

Periodic leachate sampling continues to show that the leachate contains PFAS above drinking water criteria established by EGLE in Rule 57. While there are currently no PFAS criteria established by DUWA for discharges, local limits are expected to be set according to federal and state regulation. The City is evaluating suitable technologies for pretreating leachate to meet the anticipated discharge limits economically.

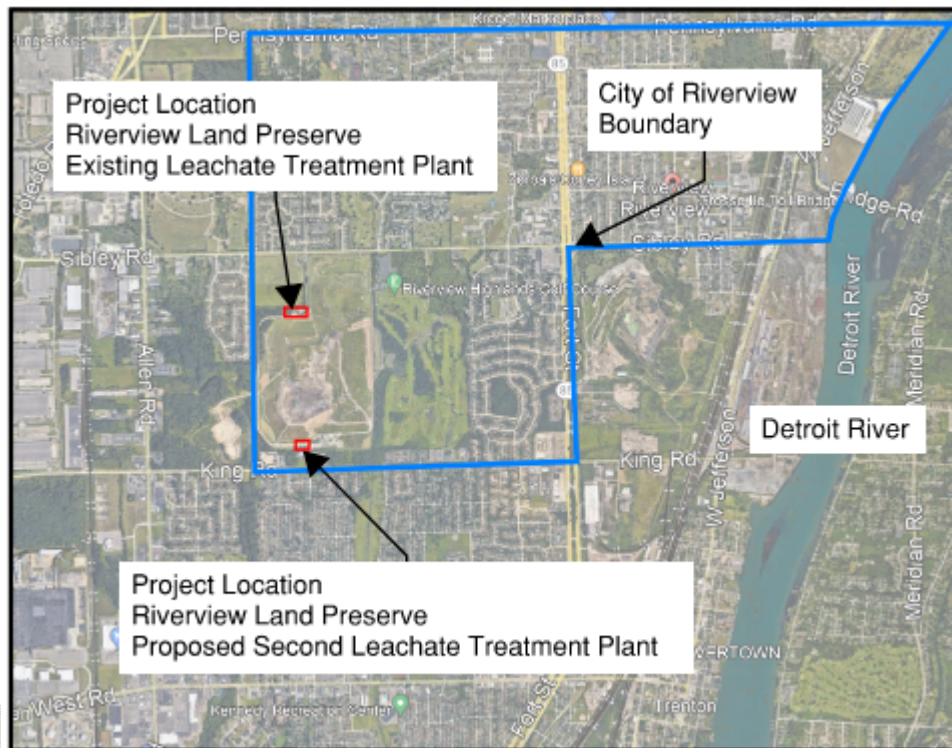
This document has been prepared in accordance with Clean Water State Revolving Fund (SRF) Project Plan Preparation Guidance adopted by Michigan Department of Environment, Great Lakes, and Energy (EGLE) (Revision 1/2023) for the SRF low-interest loan program. City intends to seek low-interest loan assistance under the SRF program to build upgrades at the existing treatment plant location, and expand at a second location, to meet the impending PFAS discharge limits. The location of the existing leachate treatment plant (LTP) and that for the proposed expansion are shown in Figure 1 below.

2.0 PROJECT BACKGROUND

Geographic Area

The study and service area for this Project Plan is the RLP property, which is entirely contained within the DUWA service area. The RLP and LTP are in the City of Riverview. The property is bordered on the north by Sibley Road, on the south by King Road, on the east by the Riverview Highlands Golf Course, and on the west by undeveloped land and residential properties. The location of the existing LTP and the proposed expansion relative to the City of Riverview are depicted in Figure 1.

Figure 1: Location of the proposed Leachate Treatment Plant Upgrade and Expansion



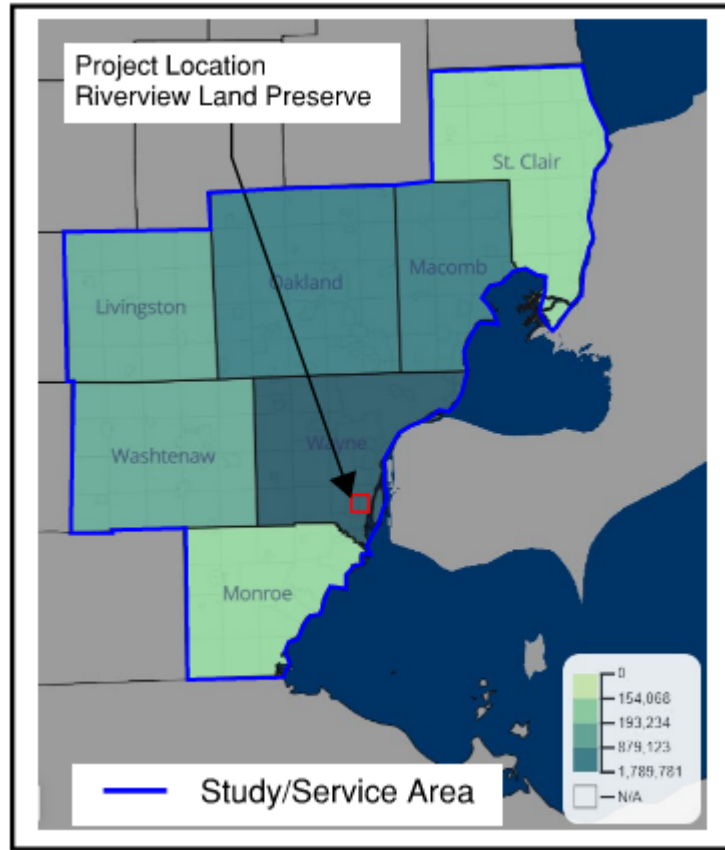
The existing LTP is designed to reduce concentrations of poly-chlorinated biphenyl (PCB) compounds from leachate collected from the northwest portion of the landfill prior to discharge to the sanitary sewer at the approved Outfall 003-B. Two additional Outfall locations 004(SW) and 007 discharge directly into the sanitary system. The City has completed a preliminary engineering study of the existing LTP which determined that expansion of the facility is not economical and feasible because of constraints of the site, existing structure, and leachate conveyance within the property. Instead, expansion of treatment capacity will be provided through construction of a separate facility proximate to Outfalls 004(SW) and 007. The location of the expansion was selected due to the proximity to where the leachate is discharged from the landfill, ease of access and existing utilities from the former BioCNG Fueling Station location. Expanding at this location eliminates the need for a conveyance system to the existing LTP or to an outfall for discharge. The BioCNG Fueling Station was removed in January 2024, leaving the utility services for natural gas and electricity in place for future use.

2.1 STUDY AND SERVICE AREAS POPULATION

The RLP serves residents and commercial entities in the Detroit Metro Area located in southeast Michigan. The Greater Detroit Metro Area is home to 4.8 million people as of the 2020 census and comprised of the seven (7)

counties: Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne. The study area is comprised of the RLP. The RLP does not accept leachate from other landfills or liquid wastes for disposal. Leachates collected and managed at other landfills within the Detroit MSA are not the subject of this study. The study/service area is shown in Figure 2.

Figure 2: Study and Service Area



2.2 ENVIRONMENTAL SETTING

This section is a synopsis of the environmental setting of the Project and provides an analysis of the potential environmental and public health impacts of the various alternatives.

2.2.1 Cultural Resources

The proposed project will not impact existing structures and facilities at the RLP. As the project location is entirely within the developed RLP property, it is not anticipated that historical or archaeological sites would be impacted. The RLP property was evaluated for the presence of archaeological and historical resources as part of the permitting process of the RLP. No sites were identified or documented to have cultural, historical, or archeological concerns. Should cultural resources be discovered during construction of the proposed upgrade and expansion, the RLP will immediately contact the State Historic Preservation Office (SHPO) and Tribal Historic Preservation Office (THPO) for guidance.

2.2.2 The Natural Environment

2.2.2.1 Climate

The climate in southeast Michigan is highly variable and is greatly influenced by the Great Lakes. Temperatures can be as high as 104°F in summer and as low as (-21)°F in the winter. Average temperatures in the summer range between 70°F and 42°F. Average winter temperatures range from 19° F to 37° F. Precipitation falls year-round, with snow being the main form of precipitation in the winter. Annual average precipitation is 34.3 inches.

2.2.2.2 Air Quality

National Ambient Air Quality Standards (NAAQS) are health-based standards set by the United States Environmental Protection Agency (USEPA). The entire State of Michigan is in attainment (meets regulations) for carbon dioxide, lead, nitrogen dioxide, and particulate matter. Although there are attainment areas within Michigan for ozone, the project property is within an attainment/maintenance area. This means the areas of the state that were previously classified as non-attainment but have since reduced their concentration levels below the NAAQS can be redesignated to attainment/maintenance and the state must continue monitoring for up to 20 years. The project property is located in a sulfur dioxide (SO₂) non-attainment area. The proposed project will not have negative impacts on air quality.

2.2.2.3 Wetlands

As shown on Figure 3, Wetlands Map, no wetlands were identified in the project areas for the LTP upgrade or expansion. An emergent freshwater wetland is adjacent to the study area for the LTP upgrade. However, this project will maintain the footprint area of the current LTP and utilize the existing developed area of the former BioCNG Fueling Station. It is not anticipated that this project will have any long-term impacts on area wetlands. The wetlands adjacent to the Leachate Facility will not be affected during the improvements.

2.2.2.4 Floodplains

As shown in Figure 4, there are no floodplains identified in the current LTP or proposed LTP expansion area. Although a floodplain is adjacent to the study area, this project is intended to maintain the same footprint area as the current LTP.

2.2.2.5 Coastal Zones/Great Lakes Shoreline

The proposed LTP upgrade and expansion will discharge into the surface water. As shown on Figure 5, the study area is not within a coastal zone. Because of its distance from the shorelines of the Great Lakes it will therefore have no direct impact on the Coastal Barrier Resources System.

2.2.2.6 Natural or Wild and Scenic Rivers

The Blakely Drain, in the southwest portion of the study area, flows north to south through the eastern portion of the Brownstown Township. The Frank and Poet Drain is on the east boundary of the study area, flowing north to south through the western portion of Riverview. These are both County-managed drains with year-round flow.

The Blakely and Frank and Poet Drains are not designated as State Natural Rivers under the Natural Rivers Program of the Land and Water Management Division of the Michigan Department of Natural Resources. Additionally, the Blakely, Frank and Poet Drains are not classified as a National Wild and Scenic River under the National Wild and Scenic Rivers System of the United States Fish and Wildlife Service.

2.2.2.7 Major Surface and Ground Waters

Major surface waters within the vicinity of the study area are the Detroit River and Lake Erie. The LTP and majority of the RLP are situated within the Frank and Poet Drain Subbasin while the western portion of the RLP lies within the Brownstown Creek subbasin. The Frank and Poet Drain Subbasin is part of the Frank and Poet subwatershed while the Brownstown Creek subbasin is part of the Blakely Drain subwatershed. The Frank and Poet Drain subwatershed occupies approximately 21.0 square miles. Brownstown Creek subwatershed occupies approximately 18.7 square miles. Both subwatersheds are part of the Combined Downriver Watershed along with the Detroit River South subwatershed. The RLP is entirely located within the Combined Downriver Watershed, a suburban watershed that occupies approximately 85.9 square miles in Wayne County.

The Combined Downriver Watershed management plan is available at:

https://www.allianceofdownriverwatersheds.com/wp-content/uploads/2014/09/combined_downriver_wmp.pdf

The Combined Downriver Watershed is a tributary of the Detroit River. The Detroit River is a 32-mile channel linking Lake St. Clair and the upper Great Lakes to Lake Erie. The Detroit River flows southerly and discharges into Lake Erie. The Detroit River is used for recreation and is the border to Canada.

In the glacial drift of the Detroit area, groundwater occurs under both water table and artesian conditions. In general, the drift consists of irregular beds of sand, silt, gravel, and clay which grade into each other laterally and vertically in relatively short distances. The area south and east of the old glacial-lake shoreline, where RLP is located, is predominantly clay with isolated terraces, beaches, and lenses of sand and gravel. Except for alluvial deposits there is little potential for developing significant groundwater resources within the old glacial lake.

Groundwater is found in a carbonate aquifer below the surficial clay at the site. The water is highly mineralized and is not a potable water source. The City's public water is supplied by Great Lakes Water Authority (GLWA).

2.2.2.8 Recreational Facilities

A map of the existing parks and recreational facilities in the City of Riverview is shown as Figure 6. The proposed project is not anticipated to impact the any recreational facilities.

2.2.2.9 Topography

The topography of the area is generally flat with little variation in elevations, ranging from 594 to 601 feet above sea level. The RLP provides the greatest elevation variation, with the highest point in the City of Riverview at 725 feet above sea level, at the RLP. Figure 7 shows a topographic map of the City of Riverview in the vicinity of the LTP.

2.2.2.10 Geology

The geological features at the RLP are consistent with the regional geologic setting. The RLP is situated in a glacial ground moraine consisting of fill containing an unsorted, unstratified mixture of clay, silt, sand, and coarser fragments deposited discontinuously by advancing glacial ice. The fill material overlies bedrock, ranging at depths from 20 to 65 feet below the surface. However, the 20-foot depths are misleading due to the fact that these borings were taken from a former borrow source in which a substantial portion of the overlying soils had been removed. The average depth of bedrock is approximately 45 feet.

Three (3) subsurface strata underlie the area (from top to bottom): the first layer contains stiff to very stiff gray silty clay. The second layer contains medium gray silty clay, and the third, or bottom, layer contains hard silty clay to bedrock. The bedrock is comprised of Dundee Limestone ranging in thickness from approximately 50 to 75 feet above the underlying Detroit River Dolomite.

2.2.2.11 Soils

A soils map for the RLP is provided in Figure 8. The formation of the soil structure took place during the glacial period, as a result of the grinding force of the glacial ice on the underlying bedrock. Soil associations within the City of Riverview typify these of the glacial lake plains with well-layered sedimentary deposits. All of the associations have nearly level to gently sloping, poorly drained to some-what drained and fine to moderately coarse textured clay soils. Individual soil profiles within most of the City have been disturbed as a result of urbanization and industrial activities.

2.2.2.12 Agricultural Resources

This proposed project will contribute to improving water quality by reducing PFAS discharges in the area served by DUWA and ultimately returned to the environment as available surface water. The PFAS removal system will not result in the development of any prime farmlands. The LTP site, where the proposed improvements will occur, is already developed and is not prime farmland.

2.2.2.13 Fauna and Flora

The study area is primarily urban and contains few animals with economic or sport value. The proposed project will be constructed in or adjacent to the existing LTP and at the former BioCNG Fueling Station location. The Michigan Natural Features Inventory (MNFI) for Wayne County was referenced for the existence of any rare, threatened, or endangered species along with U.S. Fish and Wildlife Service. The MNFI reference for Wayne County and the U.S. Fish and Wildlife Service Review are included in Appendix C.

A review of protected species was also made in February 2024, using the U.S. Fish and Wildlife Service’s website for Endangered Species Section 7(a)(2) Consultation Process. Endangered species listed as having a presence in the project area are the Indiana Bat, Northern Long-eared Bat, Tricolored Bat, and Northern Riffleshell. Threatened species include the Rufa Red Knot, Eastern Massasauga and Monarch Butterfly. The Eastern Prairie Fringed Orchid is the only threatened flowering plant in the area. While these floras are present in the vicinity of the project, no critical habitats were identified at this location. The proposed activity for this project will not impact habitat outside the footprint of the landfill.

2.2.2.14 Unique Features

No other unique features, not previously described, are documented for the site.

2.2.3 Land Use in Study Area

The study area includes the Detroit Metro Area, which consists mainly of residential use, agricultural/rural residential, vacant and not parceled land. The residential, industrial, office and mixed use areas are scattered among the seven counties with the agricultural/rural residential along the outer perimeter sections as shown on Figure 9. Table 1 lists the Detroit Metro Area uses based on the most recent available Southeast Michigan Council of Governments (SEMCOG) data for 2020.

Table 1 – 2020 Land Use Data for the Detroit Metro Area (SEMCOG, 2024)

Category		Percent of Total
Single Family Residential	449,620.6	15.3%
Attached Condo Housing	16,080.8	0.5%
Multiple-Family Housing	23,969.3	0.8%

Category		Percent of Total
Mobile Home	14,272.4	0.5%
Agricultural/ Rural Residential	1,390,901.5	47.3%
Mixed Use	3,452.5	0.1%
Retail	32,899.1	1.1%
Office	21,646.2	0.7%
Hospitality	8,099.5	0.3%
Medical	8,805.8	0.3%
Institutional	53,650.2	1.8%
Industrial	71,551.9	2.4%
Recreational/Open Space	194,838	6.6%
Cemetery	7,399.5	0.3%
Golf Course	35,163.8	1.2%
Parking	4,087.2	0.1%
Extractive	15,163.5	0.5%
TCU	68,776.2	2.3%
Vacant	253,782.5	8.6%
Water	66,304.7	2.3%
Not Parceled	202,690	6.9%
TOTAL	2,943,155.3	100%

The SEMCOG website <https://www.semco.org/community-profiles/communities> defines the intent of each land use category:

Agricultural/ Rural Residential Areas

Agricultural/ rural residential areas include any residential parcel containing 1 or more home where the parcel is 3 acres or larger.

Mixed Use

Mixed use areas include those parcels containing buildings with Hospitality, Retail, or Office square footage and housing units.

Not Parceled

Not parceled areas includes all areas within a community that are not covered by a parcel legal description.

2.3 POPULATION DATA

Between 2010 and 2022, the Detroit Metro Area population increase by 107,228. The Detroit Metro Area's population is expected to increase to 5,138,535 by 2050, assuming a 6.4% population growth rate (SEMCOG, 2024).

Table 2 - Detroit Metro Area Population 2020 through 2050 (SEMCOG, 2024)

Year	Population
2020	12,4,830,489
2030	4,904,007
2040	5,075,897
2050	5,138,535

2.3.1 Economic Characteristics

The three major occupations in the Detroit Metro Area include healthcare service; leisure and hospitality; and other services. These three main services account for over 50% of the occupations.

Table 3 – 2020 Occupations of Residents of the Detroit Metro Area (SEMCOG, 2024)

Occupation	Number of Jobs	Percent of Jobs
Natural Resources, Mining and Construction	128,984	4.8%
Manufacturing	231,832	8.6%
Wholesale Trade	93,552	3.5%
Retail Trade	241,412	9.0%
Transportation, Warehousing, and Utilities	154,420	5.7%
Information and Financial Activities	319,966	11.9%
Professional & Technical Services & Corporate HQ	349,556	13.0%
Administrative Support and Waste Services	175,461	6.5%
Education Services	179,527	6.7%
Healthcare Services	357,044	13.2%
Leisure and Hospitality	201,781	7.5%
Public Administration	160,865	6.0%
Other Services	100,936	3.7%
Total	2,695,336	100%

The Detroit Metro Area features comparatively higher rates of poverty, 13.3%. The Detroit Metro Area's median household income is \$73,354. Unlike surrounding communities, which have experienced a decrease in household income, Detroit Metro Area's median income has moderately increased by 2.9% between 2010 and 2022 (SEMCOG, 2024).

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3.0 EXISTING FACILITIES

The RLP design meets or exceeds the minimum requirements of Michigan Public Act 451 (PA 451, 1992, as amended), Part 115 and operates in compliance with their operating license number 9600, dated May 7, 2020. A schematic of the current leachate collection, conveyance, and treatment system is provided on Figure 10. Copies of the RLP's Part 115 Operating License, DUWA IPP Permit, and recent Letters of Violation are presented in Appendix A.

3.1 LEACHATE GENERATION

Leachate is primarily composed of excess rainwater percolating through the waste and removed from the landfill via the leachate collection system.

Landfill Gas (LFG) extracted from the landfill is processed to produce Renewable Natural Gas (RNG). LFG is saturated with moisture, which is removed from the gas during collection and processing. Condensate from the LFG system is collected separately and hauled off-site for treatment and disposal. The LPT expansion will treat this volume of wastewater.

Total annual leachate and condensate collection ranges from 12.3 million gallons in 2015 to 32.0 million gallons in 2020, equivalent to 33,700 gallons per day (gpd) to 87,600 gpd. A total leachate generation of 116,000 gpd is estimated to be conservative, with an additional contingency added to the historic leachate generation. Outfall 003B typically represents approximately 48% of the total leachate flow, about 40,000 gpd. The RNG Plant has an estimated maximum condensate generation of 6,000 gpd and dewatering liquid (also condensate) contributes generally approximately 10,000 gpd, which are currently not discharged via Outfall 003B. These combined wastewater streams account for a total of 56,000 gpd. The data is based on monthly recorded flow volumes for the period of 2015 through 2020. Typical liquid collection rates for all three outfalls are summarized in Table 4 and represent the design basis for this project. Locations of the outfalls and LTP along with the leachate collection and conveyance systems are shown on Figure 11.

Table 4 - Annual Average Leachate Discharge Volumes for all RLP Outfalls

	Leachate	Dewatering Liquid	Condensate	Outfall Total
Outfall 003B	40,000 gpd	10,000 gpd	6,000 gpd from RNG Plant	56,000 gpd
Outfall 004(SW)	15,000 gpd	-	-	15,000 gpd
Outfall 007	45,000 gpd	-	-	45,000 gpd
Total	100,000 gpd	10,000 gpd	6,000 gpd	116,000 gpd

3.2 EXISTING LEACHATE TREATMENT PLANT

The current LTP system is housed within a prefabricated, insulated structure located on the northwest corner of RLP. The structure has a poured concrete floor providing containment and floor drain that discharges to the condensate sump to the east of the LTP. The existing equipment layout and piping plan are shown in Figure 10. Equipment installed in the LTP is designed to reduce PCB concentrations to meet discharge requirements of the IPP using sedimentation, filtration, and adsorption on Granulated Activated Carbon (GAC). The equipment has a design capacity of 56,000 gpd. While the existing treatment process was not designed to reduce PFAS concentrations it has been shown to minimally lower PFAS levels in the effluent.

Leachate Collection and Conveyance

Three (3) existing pump stations (NE, NW, and SE) deliver leachate through a series of double-contained (4-inch within 8-inch sleeve) HDPE underground pipes to the LTP, where the transfer pipes daylight inside at the eastern side of the building. The individual pump station flows are measured by magnetic flow meters, equipped with totalizers, installed on each leachate transfer pipe within the LTP.

Within the facility the influent pipes are manifolded into a single pipe, which discharges into a 10,000-gallon equalization (EQ) tank. Flow equalization is important to wastewater treatment as it reduces extreme flow, introduces raw leachate at a regular rate to the treatment process, and balances constituent concentrations through mixing. The pipe manifold is also configured to allow bypass of the treatment system, and leachate can be directed to the two (2) 40,000-gallon Above-ground Storage Tanks (AST) outside the building. Liquid levels in the two ASTs are equalized by an 8-inch diameter pipe and they effectively act as one 80,000-gallon EQ tank. The floor drain located within the treatment plant disposes liquids to the ASTs via the condensate sump (CS-9).

Condensate Sump

Condensate is generally more heavily loaded with solids and other contaminants, which cannot be effectively handled in the GAC-adsorption treatment system. Condensate is kept separate from the leachate treatment and is disposed off site. Condensate is collected from Landfill Gas-to-Energy (LFGTE) plant directly into the two (2) 40,000-gallon ASTs. Condensate lift station CS-9 collects condensate from the landfill through sumps CS-11 and CS-12, and pumps into the ASTs for off-site disposal.

Process Control and Automation

Operation of the treatment system is controlled and monitored with a Programmable Logic Control (PLC) system. The Allen Bradley Compact Logix +1000 PLC, equipped with a Human-Machine Interface (HMI), monitors inputs from flow and pressure gages and controls pumps and actuated valves based on a predetermined logic program. Operational data is recorded, and alarms can be sent to the office if indicated based on operating parameters. The PLC interface can be accessed onsite via the HMI or accessed remotely via an internet connection to monitor or control the treatment system.

3.3 NEED FOR THE PROJECT

On September 17, 2021, DUWA revised the Industrial Pretreatment Program (IPP) (Appendix A) and included monitoring and reporting requirements for PFAS. Concurrently, the City was notified about DUWA's intent to set discharge limits for two (2) PFAS (PFOA and PFOS). In recent communication (August 8, 2023), DUWA referenced EGLE's updated Rule 57 limits for three (3) PFAS (PFOA, PFOS and PFBS) from September 26, 2022. As of October 12, 2023, EGLE has updated Rule 57 to include five (5) PFAS compounds (Table 5). While the existing treatment system has been shown to reduce PFAS concentrations, the reductions are not sufficient to meet the EGLE Rule 57 limits for PFAS which are anticipated to be included in the future permit and are liable to frequent changes. (It should be noted that the Rule 57 limits are for drinking water and may not directly correlate

to industrial wastewater permit limits. However, DUWA's effluent discharges to surface water which is used for a drinking water source and thus DUWA may impose a higher correlation to the Rule 57 limitations.)

Table 5 - Human Non-cancer Values, Drinking Water for Five (5) PFAS (EGLE Rule 57, October 12, 2023)

PFAS	Limits
PFOS	11 ng/l
PFOA	66 ng/l
PFBS	8,300 ng/l
PFHxS	59 ng/l
PFNA	19 ng/l

PFAS are a class of several thousand anthropogenic compounds that were initially developed in the 1940s and have found widespread use in industry, consumer products, food and personal care packaging, and manufacturing. Landfills have historically accepted waste containing PFAS and have limited control over the PFAS content in the incoming materials. Landfills are passive receivers of PFAS-containing waste, i.e., landfills do not produce or use PFAS. Yet the public, utilities, and regulators have identified landfills as a significant source with the potential to impact drinking water resources.

3.3.1 Consent Orders

The RLP discharges leachate at three (3) outfalls and monitors discharges in accordance with the IPP permit. Due to poly-chlorinated biphenyl (PCB) concentrations periodically exceeding permit limits from Outfall 003B, the RLP installed the LTP in 2015. The treatment process employs filtration and GAC to remove organic compounds from the leachate prior to discharge. Monitoring data demonstrates that the LTP meets permit requirements.

There are no current consent orders in effect. Historic effluent monitoring data indicates non-compliance violations of permit limits with respect to phenolics and mercury. A phenolics permit exceedance occurred at Outfall 003B during the sampling of discharge in March 2021 and July 2022. It was resolved with chemical treatment in the wastewater stream. A mercury permit exceedance also occurred at Outfall 003B in May 2023. Resampling did not confirm the presence of mercury. Exceedances of mercury are very rare and the last five (5) years of monitoring results at Outfall 003B all have been non-detect except for the above-referenced exceedance.

3.3.2 Water Quality Problems

The project is needed to address water quality requirements related to PFAS in the industrial discharges from the RLP. As indicated above, water quality incidents at RLP include sporadic elevated PCBs, mercury, phenolics, and now, as-yet unregulated PFAS in discharges to DUWA. The goal of this SRF loan application is to upgrade the existing system with new technology to consistently address these issues and to expand treatment capacity for currently untreated wastewater streams. The current wastewater exceeds anticipated effluent limits for PFOS, PFOA, PFHxS and PFNA. Permit limits for phenolics are met because of the existing treatment capability. To avoid future mercury (or heavy metals) impacts and to address PFAS, the treatment capabilities at the RLP must be expanded. In case of permit exceedances, DUWA or EGLE would initially issue Notices of Violations, followed by fines, schedule hearings, and eventually enter into an Administrative Consent Order requiring the RLP to achieve compliance within an agreed upon schedule.

3.3.3 Compliance Status

DUWA, in accordance with the provisions of Article IV, Section 4.02 of the DUWA Sewer Use Ordinance (SUO) and pursuant to the requirements of the Industrial Pretreatment Program as specified in 40 Code of Federal Regulations (CFR) 403.8(f), has permitted the RLP to discharge landfill leachate and maintenance facility process waters to the DUWA sanitary sewer system. Leachate is discharged in accordance with the discharge limits and monitoring requirements of IPP Permit No. D-10804, which was issued January 20, 2020, with revisions on May 13, October 23, and November 04, 2020, and January 15, and September 17, 2021. A copy of the most recent DUWA IPP permit is included in Appendix A.

3.3.4 RLP LTP Performance and Condition

The objective of effective leachate treatment is to reduce the concentrations of regulated constituents to levels below their respective discharge limitations, balancing capital and operating cost while considering treatment reliability and the ability to reasonably address changes to discharge limitations as environmental standards evolve.

The current DUWA IPP Permit specifies discharge limitations for six (6) constituents (phenols, PCB, mercury, phosphorus, cBOD₅, and TSS) and requires monitoring and reporting of four (4) compound groups: volatile and semi-volatile organic compounds, metals and PFAS. Discharge limitations and typical leachate discharge concentration ranges for each regulated compound are provided in Table 6 below. Concentrations greater than discharge limitations are **bold**.

Table 6 - RLP Discharge Limitations and Typical Concentrations Ranges

	Units	Discharge Limitation	Outfall 003B	Outfall 004	Outfall 007
PFOS*	ng/l	11	236 – 590	25– 360	24 – 150
PFOA*	ng/l	66	54 – 3,900	65- 1,600	160 – 420
PFBS*	ng/l	8,300	45 – 3,700	54 – 2,700	8.8-180
PFHxS*	ng/l	59	58-1,700	69-1,500	16- 240
PFNA*	ng/l	19	5.0 - 118	8.5- 114	8.0- 121
Phenolics, total	mg/l	1.0	<0.10 – 1.66	<0.10 – 2.28	<0.10 – 0.53
PCB, total	mg/l	<0.0002	<0.000093 – <0.0001	<0.000093 - <0.00011	<0.000094 – <0.0001
Mercury, total	mg/l	<0.0002	<0.00061	<0.0002	<0.0002
Phosphorus, total	mg/l	53.4	2.9 – 3.75	0.55 – 5.8	<1.2 – 3.7
cBOD ₅	mg/l	2,200	73 – 945	75 – 2,079	62 – 109
TSS	mg/l	2,600	4 – 28	25 – 206	<2.5 - 10

* Presumed discharge limitations based on EGLE Rule 57 (October 12, 2023)

The existing LTP equipment is functioning as intended but is not capable of meeting the EGLE Rule 57 limits which are anticipated impact the IPP permit in the near future. Furthermore, the LTP only services Outfall 003B. Overall water quality will be adversely affected if the existing process is not upgraded and expanded to Outfalls 004(SW) and 007.

Table 7 - DUWA Effluent Data

	Units	Discharge Limitation	Effluent
PFOS*	ng/l	11	6.1- 59**
PFOA*	ng/l	66	6.1 – 16**
PFBS*	ng/l	8,300	8.8***
PFHxS*	ng/l	59	5.6***
PFNA*	ng/l	19	<1.7***

* Presumed discharge limitations based on EGLE Rule 57 (October 12, 2023)

** Data from 2018 to 2023

*** Data from Feb. 2024

3.3.5 Projected Needs

The RLP will continue to operate within its currently licensed disposal area over the next 11 years until anticipated final closure in 2035. RLP is required to maintain the current leachate treatment system during that time, as well as throughout the 30-year post-closure period, per the Part 115 rules. The active portions of RLP includes seven cells designated as Cell 1 through Cell 7 (159.8 acres) and the closed portion, the Golf Practice Range (51.5 acres). Currently, Cells 4, 5 and 7 are receiving waste.

Total annual leachate collection ranged from 17.7 million gallons in 2022 to 32.8 million gallons in 2023, equivalent to 48,500 gallons per day (gpd) in 2022 to 89,800 gpd in 2023. Further increase in leachate volume is not anticipated, as portions of the RLP will be filled to grade and final cover will be installed as part of the final closure. Final cover is designed to prevent stormwater infiltration into the waste through use of a synthetic cover. Leachate production rates will decline asymptotically to a steady long-term state during the 30-year post-closure period.

Over time, as the waste decomposes, the leachate chemistry changes. Typically, concentrations of indicator parameters such as ammonia, TKN, BOD and COD will reduce. Current bans on PFOA and PFOS in U.S.-made consumer goods may translate to long-term reduction in concentrations of these compounds in leachate. However, breakdown of wastes manufactured or landfilled prior to the ban may continue to release PFAS into the leachate. The fate and transport of PFAS within landfills is not well understood and is a subject of ongoing research.

The following design criteria were developed by the RLP as items to be addressed in the Project Plan:

- Utilize existing LTP processes and structures to the maximum extent possible.
- Implement efficient treatment technology.

-
- Optimize operation and maintenance costs.
 - Optimize site layout.
 - Coordinate with existing processes.
 - Plan for reliable long-term function of the systems.
 - Futureproofing to changes in discharge requirements, and.
 - Cost effective construction and operation.

Three main technology alternatives with three treatment options were evaluated based on the opinion of probable construction cost, estimated annual operation cost, and present worth analysis.

3.3.6 Future Environment Without the Proposed Project

If the proposed leachate treatment system improvements are not implemented, RLP would not be able to comply with future effluent discharge limits for PFAS and other emerging contaminants which are expected to be included in the DUWA IPP Permit renewal and other related regulatory programs. Without the system improvements, PFAS compounds will continue to pass through the existing treatment, discharging to the DUWA sanitary sewer system and potentially endangering human health via direct and indirect exposure to PFAS compounds. If DUWA issues violation notices that limit or prevent landfill operations, leachate management would likely require hauling for disposal at significant cost and environmental risk. With anticipated widespread adoption of stringent discharge limitations, it will become progressively more challenging for the City to responsibly manage its leachate in a cost-effective and compliant manner.

4.0 ANALYSIS OF ALTERNATIVES

In accordance with EGLE's project plan guidance, this section describes potential alternatives to meet anticipated wastewater discharge limits. The federal and state regulations issued by EPA and EGLE are applied to the discharge from DUWA to the receiving water body. In order to meet the EPA and EGLE limitations, DUWA must manage their intake of wastewaters and emerging contaminants, which results in IPP restrictions and limitations on industrial users such as RLP.

4.1 NO ACTION

RLP recognizes the need to periodically make improvements at the LTP. The "No Action" alternative was considered but will not allow the RLP to address its current needs and could result in IPP Permit violations. The no-action alternative will likely result in future non-compliance and violations, or higher costs to implement treatment at a later date with a shorter timeline. Additionally, the impact to the environment and human health will continue to accumulate, which is inconsistent with current regulatory programs and environmental protection objectives.

"No action" is not considered a viable alternative and is not discussed in detail.

4.2 OPTIMUM PERFORMANCE OF EXISTING SYSTEM

The RLP is operating and maintaining the existing treatment system to comply with current permit requirements. However, the existing treatment system was not designed to remove PFAS. Upgrades are required for the current system to meet the anticipated PFAS discharge limitations. Optimizing operation of the existing treatment system in its current configuration cannot accomplish this objective.

4.3 WATER AND ENERGY EFFICIENCY

The considered upgrades and expansion alternatives were developed to meet anticipated discharge requirements, which will ultimately contribute to improving DUWA's discharge quality. The proposed approach increases efficiency by using a modular design. The modular approach places the proposed upgrades and expansion in proximity to existing leachate collection infrastructure and using existing pipe systems to reduce liquid transfers within the facility. Specifically, constructing the LTP expansion proximate to the active cells (4,5 and 7) with separate outfalls reduces capital and operating cost. The former BioCNG Fueling Station location, on the south side of RLP, is near the south active cells and has most of the required utilities already in place. . Furthermore, the considered treatment processes are physico-chemical processes that do not require maintaining biomass or continuity of treatment.

It should be noted that one considered alternative, i.e., reverse osmosis (RO), has been demonstrated to produce effluent suitable for direct discharge to a surface water body. Direct discharge can provide multiple benefits including improved surface water quality, reduced energy consumption by DUWA, and provide DUWA treatment capacity for other industrial users.

4.4 REGIONAL ALTERNATIVE

Regional leachate treatment for conventional pollutants is available at various local wastewater treatment plants (WWTPs) including the Great Lakes Water Authority (GLWA) and Trenton . RLP hauls condensate and off-spec leachate to an industrial wastewater treatment facility by Usher Oil at a significant cost, mostly incurred for transportation. Comprehensive onsite treatment will coalesce capital and operating expenses to provide high-

quality treatment while reducing traffic and associated pollution/emissions and minimizing the risk of uncontained spills off site.

A review of leachate management practices at the RLP compared no-action (continued hauling) and the development of on-site treatment solutions, culminated in the 2022 leachate treatability study. The study considered construction of a sewer to GLWA WWTP but was determined not to be economically viable due to distance and right-of-way issues. Hauling was, and continues to be, a viable regional disposal option, but at a significantly higher total cost than on-site treatment system. However, due to anticipated regulatory changes hauling may not be an option as more and more wastewater treatment facilities will implement PFAS reduction measures and require pre-treatment.

However, the recent focus on PFAS eliminates these other regional facilities as a leachate disposal option as they are not equipped to remove PFAS or are expected to impose similar restrictions on incoming wastewaters with high PFAS concentrations, such as leachate. Based on these considerations, a regional alternative for PFAS-containing hauled wastewater, including leachate, is a non-viable option and is not included as part of this project plan.

4.5 ANALYSIS OF PRINCIPAL ALTERNATIVES

The principal alternatives evaluated in this section focus on PFAS removal first, but with a view toward other emerging contaminants as well (“futureproofing”). The alternative options discussed below are also able to remove phenolics, PCBs and mercury during the leachate treatment, as required to meet the IPP Permit requirements.

PFAS molecules contain chains of carbon-fluorine (C-F) atoms of varying lengths and functional ‘heads’. The strong C-F bond makes PFAS resilient to biological, chemical, and physical degradation and contributes to the desirable properties PFAS provide. These same properties make PFAS highly resistant to conventional biological and most physio-chemical treatment processes. Separation processes are presently the most effective means for reducing PFAS but result in concentrated PFAS residual. Destructive technologies are characterized by high energy consumption and are challenged by the relatively low concentrations of PFAS in raw leachate. Therefore, it is commercially more practical to utilize separation followed by destructive technology on the concentrated PFAS residual stream.

Separation processes take advantage of different physical properties of PFAS molecules, such as adsorption, hydrophobicity, and molecule size. The same properties are responsible for different treatment efficacies for shorter- and longer-chained PFAS molecules. In general, longer chains are more readily removed than short-chained PFAS. PFOS and PFOA are both considered long-chain PFAS while PFBS is considered short-chained.

Three physico-chemical treatment processes are presently considered viable for leachate treatment for PFAS:

- Adsorption using GAC and/or Ion Exchange (IX) resin.
- Hydrophobicity capture using Foam Fractionation (FF); and,
- Molecule size capture using Reverse Osmosis (RO).

Leachate evaporation is not considered a viable option for the RLP due to the Gas Rights Agreement the City has entered with a third-party developer. As a result, LFG is not available for use in leachate evaporation and the combined revenue from the sale of brown gas and environmental attributes is of greater value to RLP than the use of LFG for leachate evaporation.

Based on the needs identified from the evaluation of the LTP, the following project Alternatives are proposed for consideration:

- Alternative A. LTP Improvements and New LTP with GAC & Foam Fractionation Treatment

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- Alternative B. LTP Improvements and New LTP with GAC & IX Adsorption Treatment
 - Alternative C. LTP Improvements and New LTP with Reverse Osmosis Treatment

Each alternative is pre-engineered and self-contained. For each alternative, two (2) LTP locations are proposed: (1) upgrading the existing LTP and (2) construction of a new LTP at the former BioCNG Fueling Station. Each LTP location will have a capacity of 50,000 gpd for a total capacity of 100,000 gpd. In all cases, treatment of residuals, or residuals management, includes off-site disposal.

Alternative A. LTP Improvements and New LTP with GAC & Foam Fractionation Treatment

PFAS are surfactants with hydrophilic (water-attracted) and hydrophobic (water-repellent) tails. As such they readily align around air bubbles and accumulate as a foam which can be skimmed off, collapsed, and stored in a separate vessel. Foam fractionation has limited to no effect on 'conventional' leachate constituents. While it may reduce the concentration of volatile compounds the effect is not advertised by vendors or guaranteed. Foam fractionation is usually set up with cascading units to progressively separate and concentrate and PFAS from the leachate.

Foam fractionation would be used to remove PFAS but would need to be augmented with GAC and filtration/clarifiers to treat for conventional leachate constituents of concern (including PCBs). Figure 12 is a process flow diagram for Alternative A.

The existing LTP includes a GAC system. The upgrades to the existing LTP would include addition of foam fractionation and filtration. The proposed equipment will fit within the existing LTP building, and the existing storage tanks will be converted to equalization (EQ) tanks upstream of the existing LTP. The existing GAC system would continue to be utilized but reconfigured. The new LTP would require site preparation, new concrete foundation and building/enclosure, new EQ tank, new GAC, and new foam fractionation equipment.

System operation will require a part-time operator as most activities will be required on a periodic schedule. Daily inspection, performance checks, and routine maintenance for both sites are expected to require less than half of one day. The following skills and experience would be required to operate and maintain the treatment system:

- Experience with chemical dosing systems, including operation and maintenance of pumps and replacement of chemical supplies.
- Perform tests to periodically determine optimal chemical dosing .
- Sample collection, lab coordination, and ability to understand and interpret lab results.
- Coordinate and supervise media replacement.
- Perform plumbing maintenance and repair.
- Document and record system performance, maintenance, and repairs; and,
- Communicate system status, performance, and any issues to management.

Alternative B. LTP Improvements and New LTP with GAC & IX Adsorption Treatment

In adsorptive processes, molecules become attached to surfactants by intermolecular forces when in close proximity. Adsorptive media include activated carbon (GAC), ion exchange (IX) resins, clays, and certain polymers. Molecules present in the leachate 'compete' for adsorption sites on the media. Once all sites are occupied, the spent media loses its ability to remove compounds. Adsorption is a non-selective process and is driven by the strength of the intermolecular forces. Stronger bond-forming molecules and those present in larger numbers will outpace less-numerous molecules and those forming weaker bonds with the adsorptive media. To increase adsorption efficiency, most media have large specific surface areas and small pores. The latter can

readily clog, obscure adsorption sites, and reduce the effective efficacy of the medium. Therefore, the selection of adsorption media is critical.

To more effectively remove PFAS from leachate, pre-treatment is required to reduce the concentrations of suspended solids (TSS) and organic carbon (TOC). TSS can "blind" the media while the TOC outcompetes PFAS for adsorption. Pre-treatment generally consists of coagulation and flocculation followed by sedimentation/settlement or dissolved air flotation and skimming (DAF).

Adsorption creates two waste products: (i) spent media, and (ii) sludge:

- Spent Media: the amount and frequency of media change out is dependent on the leachate treatment flow rate, pre-treatment efficacy, and contaminant concentration. Adsorbed contaminants will not be readily desorbed from the media, which can be disposed of in MSW landfills or re-activated by suppliers for reuse; and,
- Sludge: a semi-solid, high water content material consisting of conditioning chemicals used in the pre-treatment process. The material will have a low solid content and comprise about 2% to 3% of the treatment leachate volume. The material should be suitable for disposal at the landfill (if dewatered) or to an offsite location, e.g., DUWA, for dewatering and disposal.

Alternate B would consist of pre-treatment units for the removal of solids and two (2) trains of adsorption vessels: GAC followed by IX Resin. Figure 13 is a process flow diagram for Alternative B. GAC is effective at removing long-chained PFAS whereas IX Resin is more effective for short-chained PFAS; both are needed for complete and effective PFAS removal. Each train will consist of at least two GAC and two IX Resin vessels, vessels to be in a lead/lag configuration. The number of vessels in each train may be increased to optimize utilization of the existing treatment building. The lead vessel in each train would receive the influent until testing indicates that breakthrough is imminent, . At which point the roles of the vessels will be reserved and a media exchange scheduled.

The existing LTP has a GAC system. The upgrades to the existing LTP would include addition of IX Resin vessels. The equipment will fit within the existing LTP building, and the existing storage tanks will be converted to EQ tanks upstream of the existing LTP. The existing GAC system would continue to be utilized but reconfigured. The new LTP would require site preparation, new concrete foundation and building/enclosure, new EQ tank, new GAC, and IX Resin equipment.

System operation will require a part-time operator as most activities will be required on a periodic schedule. Daily inspection, performance checks, and routine maintenance are expected to require less than half of one day. The following skills and experience would be required to operate and maintain the treatment system:

- Experience with chemical dosing systems, including operation and maintenance of pumps and replacement of chemical supplies.
- Perform tests to periodically determine optimal chemical dosing .
- Sample collection, lab coordination, and ability to understand and interpret lab results.
- Coordinate and supervise media replacement.
- Perform plumbing maintenance and repair.
- Document and record system performance, maintenance, and repairs; and,
- Communicate system status, performance, and any issues to management.

Alternative C. LTP Improvements and New LTP with RO Treatment

RO is a physical form of treatment that removes contaminants by forcing water molecules through a semi-permeable membrane. Liquid is forced through the semi-permeable membrane through the use of pressure. The semi-permeable membrane has small apertures (pores), which prevent molecules larger than the pore size from passing through the membrane. These larger molecules are “rejected” and removed from the stream. This reject stream contains the concentrated contaminants, and the volume is dependent upon the contaminants in the influent and the size of the pores of the membrane. The “clean” water molecules are discharged as effluent to the receiving body (sewer, stream, etc.)

RO is a non-selective form of treatment. Separation of contaminants is based solely on the size of molecules and is irrespective of chemical composition. RO has been shown to effectively treat PFAS, with typical removal over 99%, RO is effective at treating both short-chained and long-chained PFAS but tends to have higher efficiency the longer the PFAS chain. (PFOA and PFOS are long-chained PFAS compounds while PFBS is a short-chained PFAS compound.) RO has also been shown to effectively treat conventional leachate constituents including PCBs, phenolics and mercury, other metals and solids, with removal up to 99%. Laboratory testing on these constituents is typically reported as non-detect, or below the detection limit. . With this Alternative, additional treatment units would not be added to achieve the anticipated IPP Permit and EGLE Rule 57 limits for PFAS.

RO produces permeate, which is the water and molecules that pass through the semi-permeable membrane, and reject, consisting of the contaminants which did not pass through the membrane. Generally, about 10% of the influent volume is reject depending on site-specific liquid makeup. The reject must be properly managed and disposed. Reject can be reinjected into the waste mass or hauled offsite for disposal.

An RO treatment system would consist of a pre-treatment unit, including a filtration unit, for the removal of larger solids prior to treatment through the membranes, and an RO membrane unit. A polishing carbon filter could be added after treatment through the RO membranes if needed. Figure 14 is a process flow diagram for Alternative C.

The existing LTP has a GAC system. The upgrades to the existing LTP would include removal of the four (4) existing GAC vessels, repurposing the existing smaller treatment storage tanks, addition of RO equipment and conversion of the existing AST to EQ tanks upstream of the existing LTP. A majority of the RO equipment will fit within the existing LTP building, with potential need for storage tank(s) to be located outside. If equipment is located outside, concrete foundation and an overhang will be installed. The new LTP would require site preparation, new concrete foundation and building/enclosure, equalization tank(s) and new RO equipment.

System operation will require a part-time operator as most activities will be required on a periodic schedule. Daily inspection, performance checks, and routine maintenance is expected to require less than half of one day. The following skills and experience would be required to operate and maintain the treatment system:

- Experience with chemical dosing systems, including operation and maintenance of pumps and replacement of chemical supplies.
- Perform tests to periodically determine optimal chemical dosing .
- Sample collection, lab coordination, and ability to understand and interpret lab results.
- Coordinate and supervise media replacement.
- Perform plumbing maintenance and repair.
- Document and record system performance, maintenance, and repairs; and,
- Communicate system status, performance, and any issues to management.

4.6 PROCESS IMPROVEMENTS ALTERNATIVES EVALUATION

4.6.1 Monetary Evaluation

A present-worth analysis has been completed for the principal alternatives as shown in Table 7. Detailed cost estimates are included in Appendix B. The actual engineering and construction cost would be the result of competitive bidding. The analysis assumed the following:

- Capital Costs: equipment, building, site improvements, delivery and construction, mobilization and demobilization, survey, soil erosion and sediment control and general conditions/contractor overhead costs.
- Salvage Value: equipment components will have useful life of 20 years and structural components 40 years. No equipment salvage is included in cost.
- Operation and Maintenance costs are based on the anticipated flow rate of 100,000 gpd total.
- Planning Period: 20 years
- Present Worth of O&M (cost to operate and maintain the system) at 0.3% for 20 years.
- Present Worth Factor for Salvage Value: Not Applicable

Table 8 - Cost Effective Analysis for Alternatives

Description	Alternative A (GAC & Foam)	Alternative B (GAC and IX)	Alternative C (RO)
Capital Costs	\$8,801,959	\$5,307,965	\$11,614,002
Annual Operation and Maintenance (O&M)	\$1,638,800	\$1,791,205	\$1,391,940
Future Salvage Value	\$0	\$0	\$0
Present Worth of O&M	\$31,743,557	\$34,695,654	\$26,961,891
Present Worth of Salvage Value	\$0	\$0	\$0
Total Present Worth	\$28,386,247	\$26,713,558	\$28,397,977

4.6.2 Environmental Evaluation

Table 8 summarizes the impacts of the principal on the environment

Table 9 - Environmental Impact of Alternatives

Environmental	Impacts
Cultural Resources	No impact
Climate	No impact
Air Quality	Minimal impact during construction from equipment

Environmental	Impacts
Wetlands	No impact
Coastal Zones	No impact
Floodplains	No impact
Natural or Wild and Scenic Rivers	No impact
Major Surface Waters	No impact, soil erosion control measures will be in place to mitigate impact from construction.
Recreational Facilities	No impact
Topography	Excavation required; area will be restored after construction to existing grades.
Geology	No impact
Soils	Excavation required
Agricultural Resources	No impact
Fauna and Flora	No Impact, No Trees will be removed to accommodate new facilities or expansions.

4.6.3 Technical and Other Considerations

Table 9 and 10 summarizes the advantages and disadvantages of each alternative and offer a ranking based on environmental, cost, technical, and other issues. Scoring is based on 1 being the least desirable and 3 being the most desirable; a higher score is a better product.

Table 10 - Alternative Advantages and Disadvantages

Category	Advantages	Disadvantages
No Action	<ul style="list-style-type: none"> No capital costs 	<ul style="list-style-type: none"> Violations of DUWA IPP Permit PFAS Limit Cost of leachate hauling and disposal
Alternative A. LTP Improvements and New LTP with GAC & Foam Fractionation Treatment	<ul style="list-style-type: none"> System treats a much wider range of contaminants. 	<ul style="list-style-type: none"> Not as efficient/reliable at treating contaminants as RO. Foam fractionation only treats PFAS. Higher amount of residuals (spent media and floc) requiring off-site disposal. Requires discharge to DUWA Sewer System Highest Present Worth and O&M costs

Category	Advantages	Disadvantages
Alternative B. LTP Improvements and New LTP with GAC & IX Adsorption Treatment	<ul style="list-style-type: none"> • Lowest Present Worth 	<ul style="list-style-type: none"> • Large maintenance effort • Complicated system to operate. • Higher amount of residuals (spent media) and floc. • Requires discharge to DUWA Sewer System
Alternative C. LTP Improvements and New LTP with Reverse Osmosis Treatment	<ul style="list-style-type: none"> • System treats effectively a much wider range of contaminants and potential future contaminants. • Simple and reliable operational system • Residuals can be recirculated into the landfill. • Can discharge to open waters with NDPES Permit • Lowest O&M Costs 	<ul style="list-style-type: none"> • Concentrate disposal costs.

Table 11 - Alternative Ranking

Item	Category	No Action	Alternative A. GAC & Foam Fractionation Treatment	Alternative B. GAC & IX Adsorption Treatment	Alternative C. Reverse Osmosis Treatment
1.	Short Term Environmental Impacts	3	3	3	3
2.	Long Term Environmental Impacts	1	2	2	3
3.	Mitigation of Environmental Impacts	3	3	3	3
4.	Reliability	1	3	2	3
5.	Implementation	3	2	2	3
6.	Infrastructure Improvements	1	3	3	3
7.	Growth Capacity	1	3	3	3
8.	Annual Costs	2	2	2	2
9.	Operation & Maintenance	1	3	3	2
10.	Water Quality	1	3	2	3
11.	Emergency Redundancy	1	2	2	2

Item	Category	No Action	Alternative A. GAC & Foam Fractionation Treatment	Alternative B. GAC & IX Adsorption Treatment	Alternative C. Reverse Osmosis Treatment
12.	Probability of Success	1	3	2	3
	Totals (higher is better)	19	32	29	33

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5.0 SELECTED ALTERNATIVE

5.1 DESCRIPTION

The selected PFAS Leachate Treatment approach for the RLP is Alternative C, Improvements with Reverse Osmosis Treatment at Existing LTP and Proposed New LTP on the south side of the RLP property. The LTP design will meet the existing DUWA IPP permit requirements (Appendix A). In addition, the system will be designed to meet EGLE's pending administrative consent order to address water quality issues related to PFAS (particularly PFOA and PFOS), and potential, intermittent non-compliance events with phenolics and mercury.

These improvements will provide the existing LTP and new LTP with combined design capacity for 100,000 gallons per day. Alternative C was selected based on the present worth cost, the construction implementation of the project, and the ability of the system to effectively treat a much wider range of contaminants and potential future contaminants than the other alternatives.

5.1.1.1 Condensate

Condensate generated from the RNG plant will be collected and conveyed to the existing LTP to be upgraded. The condensate and leachate from Outfall 003B will be mixed in the EQ tanks (existing ASTs) prior to treatment through the LTP.

5.1.1.2 Programmable Logic Control (PLC)

The existing treatment system is monitored through a hardwired control system that provides alerts to operators of potential errors or alarms. The existing Allen Bradley Compact Logix with a Panel View +1000 PLC receives electronic signals from various monitoring devices and these inputs are used to perform tasks such as operating pumps and valves. The PLC interface can be accessed via the onsite internet connection and has the ability to be operated remotely. The PLC will control liquid levels in tanks within the LTP with leachate fed from three (3) pump stations located at the Site. The existing PLC has been determined to have the capacity to incorporate additional inputs from proposed equipment.

The new LTP will have a new PLC installed to control the operation of the new LTP.

5.1.1.3 Chemical Addition Process

A chemical dosing system for sulfuric acid will be necessary at both the existing and new LTP as a pre-treatment to the RO system. Sulfuric acid will be dosed prior to treatment to adjust the pH. The chemical dosing system will combine the following components: storage tank, pump, piping, valves, and level gauges. For purposes of this evaluation, a computerized chemical feed and control system has been selected. This type of system is programmed to feed chemicals based on pH measurements of the influent leachate. An alarm system will be programmed into the PLC to alert on pump status, high and low tank levels, and unusual operating conditions.

One (1) 1,000-gallon acid storage tank will be placed inside each LTP. Each tank will contain approximately two (2) months of chemical supply during expected flows through the LTP.

5.1.1.4 Pre-treatment System

The converted EQ tanks and new influent pump station will feed into the pre-treatment system in the existing LTP to be upgraded. A new EQ tank with an approximate capacity of 100,000 gallons and an influent pump station will be installed to feed the new LTP. Each LTP's pre-treatment system will consist of a sediment filter to remove larger solid particles and a carbon filter for optimal performance and prevent damage to the membranes.

5.1.1.5 RO System

The pre-treatment systems will feed into the RO system. At each LTP, the RO is comprised of two (2) RO treatment skids which facilitate installation and portability of the system. The first skid in the system will house a two (2)-pass RO system, consisting of a first stage and a permeate stage. All the influent feed into the RO system will pass through the first stage. In first-stage, liquid will either be rejected or passed through the membrane. The liquid that passes through the first-stage membranes will then be fed through the second, “permeate” stage for additional contaminant removal. Discharge from the permeate stage, is the “clean” permeate (liquid that passes through the membranes of the permeate stage) will meet the DUWA IPP Permit requirements and will be discharged. Reject from the permeate stage will be returned to the feed of the first stage.

The second RO skid will mount a high-pressure RO system. Reject from the first stage will be directed through the high-pressure skid for further concentration, forming a recirculation configuration. The final reject from the high-pressure stage will be sent to a 3,000-gallon residual storage tank for holding prior to disposal. Liquid that passes through the membranes (permeate) of the high-pressure stage will be returned to the feed to the first stage.

In addition to EQ tanks, there will be four (4) storage tanks required to operate each RO system: one (1) 6,000-gallon feed and pH adjustment tank, one (1) 5,000 gallon permeate storage tank, one (1) 3,000-gallon residual storage tank, and one (1) 1,000-gallon recirculation tank. Additional support tanks will be required: one (1) 1,000-gallon acid storage vessel, one (1) 3,000 gallon permeate degassifier, two (2) cleaning chemicals storage tanks. Equipment to operate the LTP includes a computer system for process control; pump skids for transfer, feed, and recirculation; metering pumps with secondary containment.

5.1.1.6 Solids Management Tank - 6,000-gallon

The existing 6,000 cone-bottomed tank will be utilized as an intermediate storage tank to equalize flows between the lamella filter and the RO system.

5.1.1.7 LTP Treated Effluent

Leachate treated by RO Systems as proposed for the RLP can meet direct discharge criteria. It is proposed to modify the RLP’s NPDES permit to facility discharge to surface waters within one (1) year of commissioning of the treatment systems. The RLP will retain the ability to discharge to DUWA and via tanker as contingency options.

5.1.1.8 Site Improvements

Site improvements including modifications to the existing leachate treatment conveyance and treatment system would need to be made to accommodate the installation of an RO system. Modifications include conversion of the existing ASTs into equalization tanks to feed the treatment plant and removal of the existing equipment within the LTP.

Currently, treated leachate from Outfall 003B can be conveyed either directly to the DUWA sewer or to the two (2) on site ASTs. Each AST is 40,000 gallons for a total storage volume of 80,000 gallons, approximately a day and half of leachate and condensate storage. The ASTs have an offloading area to fill tanker trucks for hauling leachate off-site as needed. Currently, liquid from the ASTs cannot be directed to the existing treatment plant. The Plan proposes to convert these ASTs into EQ tanks upstream of treatment. Providing equalization will allow the concentrations of the incoming liquid streams to mix and equalize to prevent highly variable conditions through the plant and provide a more consistent influent and thus consistent treatment results from the plant. The existing ASTs already have an equalization pipe between the tanks. Mixing is achieved by pumped liquid entering at the bottom of the tanks. If additional mixing within the EQ tanks is required, a mixing system can be added. The pipes will be reversed to have the EQ tanks feed the treatment plant, which may require new piping

from the tanks to the treatment plant. See the attached Site Plan for concept layout for the pump station and influent piping to the tanks and from the EQ tanks to the treatment plant.

Modifications to the existing LTP will be required to include all equipment inside the structure with the exception of the tanks. Additionally, the construction of a complete new LTP facility will include some earthwork and site preparation at the location of the former BioCNG Fueling Station.

5.2 DESIGN PARAMETERS

Based on the analyses and evaluation presented in Section 4, RLP selected Alternative C, reverse osmosis treatment, as the preferred leachate treatment option. The system design will meet the existing DUWA IPP Permit requirements (see Appendix A). In addition, the system will be designed to meet EGLE's pending administrative consent order to address water quality issues related to PFAS (particularly PFOA and PFOS), and intermittent non-compliance events with phenolics and mercury. This proposed RO treatment has the ability to reasonably address changes to discharge limitations as environmental standards evolve.

Alternative C minimizes additional space needed at the existing LTP for operation and also produces the smallest amount of residuals. If NPDES on-site direct discharge to surface water permit requirements are met, the effluent could be discharged to surface water on-site. This is a substantial savings of \$500,000 per year.

The improvement implementation plan shall require that the leachate be hauled away during construction caused by interruptions in service equipment is replaced and reconfigured. As much as possible, the duration of interruption in treatment will be minimized.

5.3 PROJECT MAPS

The location of the existing LTP and proposed new LTP facility are shown in Figure 1 above.

5.4 SRF GREEN PROJECT RESERVE

SRF Green Project Reserve funding is not applicable to this project.

5.5 SPECIAL ASSESSMENT DISTRICT PROJECTS

Special Assessment District funding is not applicable to this project.

5.6 SENSITIVE ECOSYSTEMS

Work will take place on already developed landfill property and will be isolated from potential sensitive environmental locations. It will be necessary to provide BMP soil and sedimentation control during construction when earthwork is occurring. Noise and dust must be controlled to protect neighbors and the environment.

Environmental impacts will be minor and temporary as they are construction related. Mitigation measures will be required as part of construction contracts and as required by RLP Housekeeping measures in the Operating Plan. Permits (along with related agency reviews) will be obtained during the design process.

5.7 CONTROLLING FACTORS

The controlling factors are to ensure continued reliable operation of the LTP by addressing the needs of the unit processes and by installing the best available cost-effective technology. The proposed project is geared toward

meeting PFAS limits imposed due to the potential future EGLE Rule 57 requirements, as presented in previous sections of this plan.

The DUWA IPP Permit does not contain any court orders, nor are there any local health department findings or directives that influence the design.

The permits required for construction of this alternative include:

- Soil Erosion and Sedimentation Control will fall under the existing RLP permit.
- Building permit, to be obtained from the local (City) building inspector, along with local electrical, plumbing, and mechanical permits.

5.8 USEFUL LIFE

The useful life of the SRF Project Plan components was calculated for each proposed project and can be found in Appendix B. The following assumptions were made regarding the useful life of the assets:

- Site work and piping were assigned a useful life of 40 years.
- The structures and support were assigned a useful life of 40 years.
- Process, mechanical, and electrical assets were assigned a useful life of 20 years.

The asset life was multiplied by the cost of the asset to develop a calculated life value for each asset type. The sum of the calculated life values was divided by the sum of the asset costs for each project. The weighted average useful life is approximately 26 years.

5.9 SCHEDULE OF DESIGN AND CONSTRUCTION

The proposed project schedule is summarized in Table 11 below. Milestone dates are based on the EGLE and MFA FY2025 Financing Schedule and project milestones.

Table 12 – Proposed Project Schedule

Task Description	Proposed Date
Intent to Apply	10/23/2023
City Authorizes Project Plan Preparation	1/2/2024
Project Plan/EGLE Meeting	4/4/2024
Publish Notice of Public Hearing	4/9/2024
Hold Public Hearing for Project Plan	4/25/2024
Submit Project Plan and CWSRF Scoring Criteria	5/1/2024 *
Advertise RFP for QBS Design	5/6/2024
Design Begins w/ QBS Consultant	5/21/2024
Final Project Priority List Published	8/16/2024 *
Design Complete	9/2/2024

Task Description	Proposed Date
Bid Ad Published	9/16/2024 *
EGLE Order of Approval	11/18/2024 *
SRF Bonds Sold	11/18/2024 – 12/31/2024
MFA Pre-Closing	11/29/2024 *
MFA Closing	12/13/2024 *
Notice of Award To Contractor	2/10/2025
Construction Notice To Proceed	2/17/2025
Complete Construction	7/31/2025

* - Indicates EGLE/MFA milestone from FY2025 Financing Schedule

5.10 COST SUMMARY

Table 12 below summarizes Alternative C leachate treatment system costs. The total cost presented below includes engineering and contingency allowances. Our opinion of probable cost for the associated items are detailed in Appendix B.

Table 13 - Opinion of Probable Costs

Item	Opinion of Probable Cost
RO Treatment System Equipment , Start-up, and Training	\$ 4,616,800
LTP Expansion Overhand and New LTP	\$916,263
Leachate Disposal During Construction	\$431,760
Pump Station and Piping for New LTP	\$110,000
Pump Skids, Permeate Degassifier, Chemical Storage Tanks	\$4,087,780
Total Project Cost	\$11,614,003

5.11 SRF ELIGIBLE PROJECT FUNDING

All items included in the project are believed eligible for funding under the Michigan SRF program.

5.12 IMPLEMENTABILITY

The landfill is owned by the City of Riverview. The Landfill was constructed and opened in 1968. RLP and the City of Riverview have the authority to operate and implement the selected alternative.

5.13 USER COSTS

Once the proposed leachate treatment alternative is approved, RLP will explore numerous funding options for this project to include grants, loans and/or other financial mechanisms, as it is anticipated that a blended funding

approach is needed. As the Owner, the City of Riverview will manage the selection of any funding mechanism(s) and associated user costs.

5.14 DISADVANTAGED COMMUNITIES

Neither RLP nor the City of Riverview are eligible for the benefits awarded to disadvantaged communities under the SRF Project Plan.

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6.0 ENVIRONMENTAL AND PUBLIC HEALTH IMPACTS

6.1 GENERAL

The proposed project was evaluated for the potential beneficial and detrimental environmental effects. The project was evaluated for short-term and long-term, and irreversible or irretrievable impacts, whether these impacts are direct, indirect, or cumulative.

6.2 DIRECT IMPACTS

Direct impacts are environmental impacts directly attributed to the construction and operation of the project. The proposed project was evaluated for several different areas of potential direct impact. The results of the evaluation are presented below.

6.2.1 Historical and Archaeological Resources

As stated earlier in this report, historical Environmental Assessments indicate that there are no known archaeological or architectural sites in the project area.

6.2.2 Existing and Future Water Quality

The project will have a beneficial overall impact to the surface water, as the LTP will be complying with discharge limits. Short term indirect impacts on water quality are possible. Appropriate measures will be taken during construction to avoid detrimental impact to surface waters through soil erosion and sedimentation controls. Proper precautions shall be taken during construction to deal with flows from subsurface dewatering at the site. This will include sedimentation basins and discharge point monitoring. All necessary permits will be obtained prior to the proposed activities. There are no impacts anticipated to the local groundwater.

6.2.3 Air Quality

There will be minimal short-term direct impacts on local air quality during the construction phases of this project. resulting from dust and emissions from construction equipment. Appropriate control measures will be taken to minimize dust on the site during construction.

6.2.4 Natural Setting and Sensitive Ecosystems

The project will not have a direct impact on wetlands, prime farmland, wild or scenic rivers, or endangered species. Minimal ground disturbance will occur for the LTP modifications but will not require tree trimming , tree removal or other major disturbances. A USFW Service Section 7 online review was performed. The project area is within existing maintained landscape areas, which returned an evaluation result of the “No Effect”. The USFW results are included in Appendix C.

6.2.5 Consumption of Materials

The project will use building construction materials, mechanical and process equipment, and pipe. Impacts will be mitigated through specifications requiring the contractor to reduce, re-use, and recycle as much as feasible. The project itself is predicated on using the existing LTP building and equipment, and repurposing existing tanks to eliminate new installations.

6.2.6 Human, Social and Economic Impacts

There are no direct human impacts such as dislocation or employment from the proposed project, other than the benefit of temporary construction jobs that may be created or extended during project construction. The economic benefit of the project will result in long-term lower costs for the City of Riverview, which benefits the residents through lower tax assessment.

6.2.7 Operational Impacts

The construction area is isolated, and the disruption from construction will be minimal. Chemical storage, treatment skids, and EQ tanks will be dual-contained to prevent contamination of soil, surface water, and storm water. Spills will be handled in accordance with the SWPP and SPCC Plans for the site.

Efforts will be taken to minimize the impact on treatment operations during construction and maintain disposal and treatment of leachate and condensate in accordance with permit requirements.

6.2.8 Other Impacts

No other foreseeable direct impacts were identified as a result of this project.

6.3 INDIRECT IMPACTS

6.3.1 Changes in Land Use

There are no planned infrastructure improvements that would result in a cumulative negative impact from the proposed project. The proposed project will take place entirely on the RLP property. No zoning changes will be required, as the site is already owned by the RLP and has been permitted for solid waste management and associated activities.

6.3.2 Changes in Air or Water Quality

The proposed project will not adversely impact the long-term air or water quality in the area over time. There will be emissions during construction from construction equipment. Engineered soil erosion and sediment control measures will be implemented to mitigate potential storm water quality.

The overall beneficial use of the two (2) LTP sites will be an improvement in industrial wastewater quality and volume; whether the permeate is discharged to the sewer or is permitted to direct discharge, the volume of reject will be reduced from the leachate generated. Over time, the net positive impact will benefit the users of the DUWA system and will protect the immediate environment of the RLP.

6.3.3 Changes in the Natural Setting, Cultural, Human, Social and Economic Resources

There are no anticipated long-term changes in the natural setting, cultural, human, social, or economic resources as part of the proposed project.

6.3.4 Resource Consumption and Waste Generation

The proposed project will significantly reduce the hauling as a result of the upgrades to the leachate treatment system. This will reduce truck air emissions, traffic congestion, and risk of spills, reducing the carbon footprint of the process.

Effluent discharge into the DUWA sanitary system will be stripped of contaminants, reducing the burden of treatment at the WWTP. If effluent is permitted to discharge directly into surface water body (NPDES Permit required) the connection to the DUWA sanitary sewer system may be eliminated, freeing capacity for the WWTP to treat other waste waters.

6.3.5 Other Impacts

No other foreseeable indirect long-term impacts were identified for this project.

6.3.6 Cumulative Impacts

There are no other planned infrastructure improvements that would result in a cumulative long-term impact from the proposed project.

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7.0 MITIGATION

Where impacts cannot be avoided, mitigation of adverse impacts must be provided. Various impacts identified above will be analyzed and mitigative measures addressed in the following sections.

7.1 MITIGATION OF SHORT-TERM IMPACTS

The project will be constructed using methods designed to minimize construction-related short-term impacts. These are briefly outlined below.

7.1.1 Dust Control

The bidding/contract documents will require that the contractor employ dust control measures as needed and determined by the onsite inspector. Dust control measures include the use of approved dust control chemicals, the use of water, and cleanup to minimize dust generation.

7.1.2 Soil and Sediment Control

The bidding/contract documents will require that the contractor will follow approved BMP for soil and sedimentation control (SESC) measures during construction, including structural and non-structural controls. Soil erosion will be minimized through the enforcement of the SESC plan. Excess soils from construction will be disposed in the landfill or used elsewhere on-site.

7.1.3 Noise Control

The construction times will be limited to normal landfill operating hours or as approved by the City. Construction on Sundays will be prohibited in the contract documents. Noise on the construction sites will be generated by motorized vehicles, equipment, and power tools as would be typical at a construction site. . The noise from construction will not be excessive compared to normal building construction projects where residences are nearby, .

7.2 MITIGATION OF LONG-TERM IMPACTS

Efforts will be made during the planning and construction of the LTP improvements to avoid long-term or irreversible adverse impacts.

7.2.1 General Construction

Construction operations will be controlled by the contract documents to preclude long term or irreversible impacts. The contract documents will prohibit spoils disposal in adjacent sensitive areas such as wetlands and floodplains. As work will be entirely within the footprint of the Landfill, no environmental impact is expected. Proper SESC measures will remain in effect throughout the operation of the LTPs.

7.2.2 Siting Decisions

The proposed improvements will occur at the existing LTP and at the former BioCNG Fueling Station. The Landfill itself is not located within a Zone AE floodplain (see Figure 4) or sensitive environmental features. No existing trees will be removed, and no significant earthwork or modifications are needed for the project.

7.2.3 Operational Impacts

The proposed project is intended to improve long-term operations at the RLP. None of the proposed upgrades will generate excessive noise due to operations. The operation of equipment involves pumps, valves, and computers, so the potential for accidents due to operations is minimal.

7.3 MITIGATION OF INDIRECT IMPACTS

The project will result in minimal direct impacts regarding land use and will result in net positive impacts for transportation changes, and water quality. Air quality, natural setting, and social resources for the service area are not expected to see any impact from the proposed project. The proposed improvements to the leachate treatment system will not have a negative impact on the Landfill or the surrounding area.

7.3.1 Master Plan and Zoning

The work of the project will be performed on and within the landfill property boundaries. Cultural and historical features, neighborhoods, prime or unique agricultural lands, and nearby sensitive features will not be affected.

7.3.2 Ordinances

The project does not require development of new ordinances or modification of existing ordinances.

7.3.3 Staging of Construction

Construction for the proposed project will be staged on site to mitigate traffic impacts.

We recommend the proposed project to be constructed in a single construction phase, at both locations. This provides the most cost-effective solution for construction (single mobilization of equipment) and installation of equipment (economy of repetition). The capacity and location of the LTPs should minimize the need for additional improvements or changes over the next 20 years.

8.0 PUBLIC PARTICIPATION

8.1 PUBLIC MEETING

A legal notice of the public meeting was posted on the City's website and social media. A public meeting is to be held on April 25, 2024. A copy of legal notice can be found in Appendix D.

8.2 FORMAL PUBLIC HEARING ON SELECTED ALTERNATIVE

A public hearing on the Draft Project Plan is to be held on April 25, 2024. The public hearing will include a discussion of the wastewater system needs, alternatives evaluated, projected impacts of the alternatives on the environment, the opinion of probable project costs, and monthly user costs for a typical residential customer. All Public Participation documentation can be found in Appendix D.

8.2.1 Public Hearing Advertisement

A notice of the public hearing was posted on the City's website and social media on April 1, 2024. The public hearing included a discussion of the LTP system needs, alternatives evaluated, projected impacts of the alternatives on the environment, the opinion of probable project costs, and costs. All Public Participation documentation will be included in Appendix D.

8.2.2 Public Display

The Draft Project Plan was made available for public review on April 9, 2024, which was 16 days prior to the April 25, 2024, public hearing on the City's website along with hard copies at Riverview City Hall and Riverview Veterans Memorial Library.

8.2.3 Public Hearing Transcript

A transcript of the public hearing will be included in Appendix D of this document. A copy of the public hearing attendance list will also be found (sign-in sheet) in Appendix D.

8.2.4 Public Hearing Comments Received and Answered

The typed attendance list from the public hearing will be included in Appendix D after the meeting. The public comments to be recorded as part of the Public Hearing transcript will be located in Appendix D. Additional written comments received are also included in Appendix D, along with a written response to these comments, if any are received.

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January 22, 2024

Wetlands

- Estuarine and Marine Deepwater
- Freshwater Emergent Wetland
- Estuarine and Marine Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper



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Riverview Land Preserve
SRF Leachate Treatment Plant

WETLANDS MAP

FIGURE NO.

3

PROJECT NO.
4231588

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible additional or additional flood information.

To obtain more detailed information in areas where Base Flood Elevations (BFE) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Damages to the FIRMs. Users should be aware that BFEs shown on the FIRMs represent modeled water elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRMs for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.17 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are not provided in the Summary of Damages to the FIRMs. Coastal Base Flood Elevations should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on the FIRMs.

Boundaries of the Floodways were computed at cross sections and interpolated between cross sections. The Floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Michigan State Plane South zone 6401 (FIPS ZONE 2113). The horizontal datum was NAD83. Differences in datum, projection or zone plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and geographic elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Centers
NOAA, NAD83-12
National Geodetic Survey
SDMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-1202
(301) 713-3342

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3342 or visit its website at <http://www.ngs.noaa.gov/>.

Base Map information shown on this FIRM was derived from the Wayne County Geographic Management Unit at a scale of 1:1920 from aerial photography dated April 2001.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were measured from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

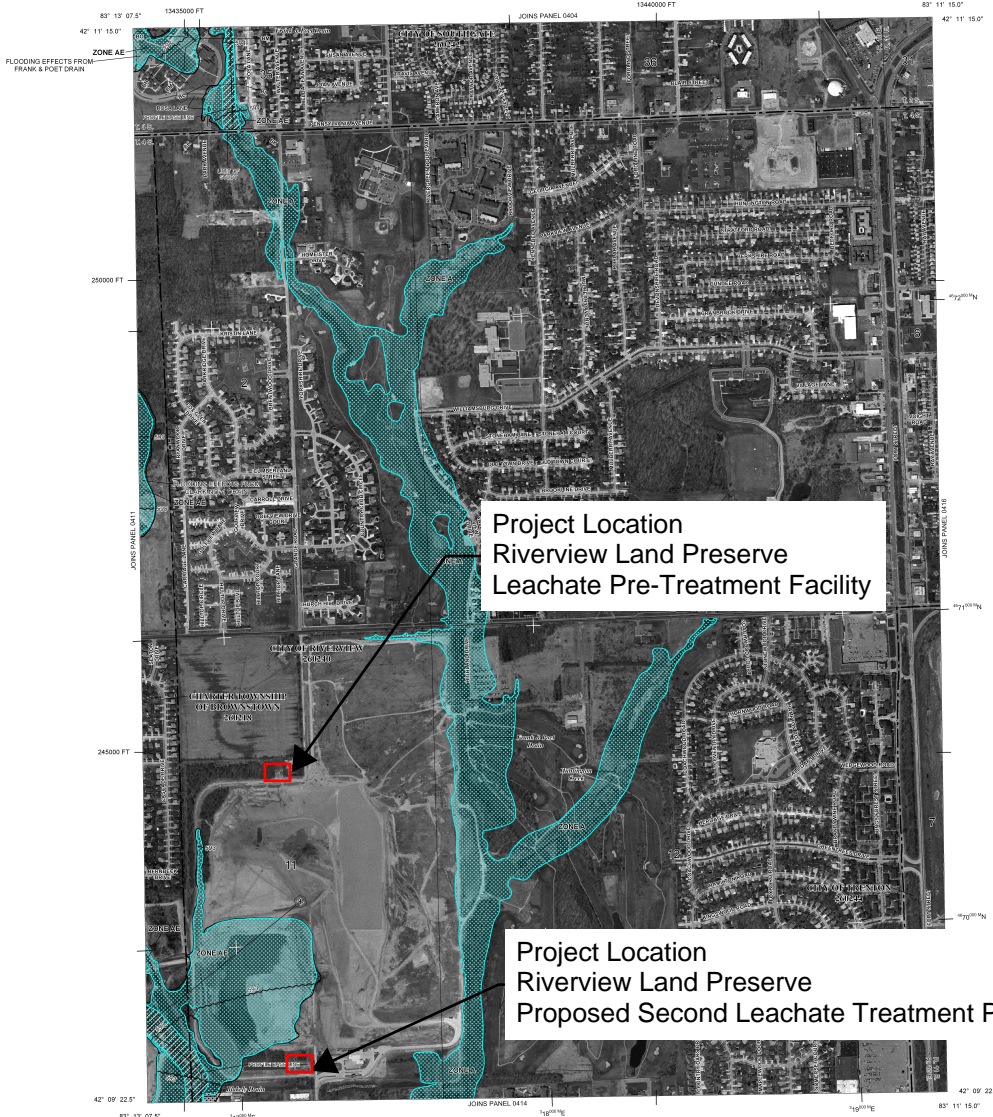
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the community project Map Index for an overview map of the county showing the layout of map panels. Community map indexes address, as well as a listing of Communities with National Flood Insurance Program files for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the Map Service Center (MSC) website at <http://www.fema.gov>. Available products may include previously issued Letters of Map Change or Flood Insurance Study Report and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have questions about this map, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information Exchange (FMIE) at 1-877-FEMA-Map or visit the FEMA website at <http://www.fema.gov> or <http://www.fema.gov/about/fmiev>.

The profile base lines depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved bathymetric data, the profile base lines, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



Project Location
Riverview Land Preserve
Leachate Pre-Treatment Facility

Project Location
Riverview Land Preserve
Proposed Second Leachate Treatment Plant

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD**
- ZONE AE** No Base Flood Elevation Determined.
- ZONE AO** Flood Insurance Determined (FIS). Flood depths of 1 to 3 feet (usually about flow on sloping terrain); also determined. For areas of shallow flow on sloping terrain, also determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually about flow on sloping terrain); also determined. For areas of shallow flow on sloping terrain, also determined.
- ZONE AV** Area to be protected from 1% annual chance flood by a Federal Flood Protection system, either construction or levee. Flood elevations are provided to provide protection from the 1% annual chance or better flood.
- ZONE VE** Coastal Flood Zone with velocity hazard (wave action) Base Flood Elevation Determined.
- ZONE V1** Coastal Flood Zone with velocity hazard (wave action) Base Flood Elevation Determined.

FLOODWAY AREAS IN ZONE AE
The flooding in the vicinity of a stream in an adjacent floodway area that may be less than 1% annual chance flood is not shown. The floodway area can be used without additional elevation or flow depth.

OTHER FLOOD AREAS
Areas of 0.2% annual chance flood areas of 1% annual chance flood with a depth of 1 to 3 feet (usually about flow on sloping terrain); also determined. For areas of shallow flow on sloping terrain, also determined.

OTHER AREAS
Areas determined to be outside of the 0.2% annual chance floodplains.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS
OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

0.2% Annual Chance Floodplains
1% Annual Chance Floodplains
Floodway Boundary
Zone O Boundary
Zone AE Boundary
Zone V1 Boundary
Zone V2 Boundary

Boundary, dividing Special Flood Hazard Areas of different Base Flood Elevations, Flood Depths or Flood Velocities
Base Flood Elevation and water elevation in feet
Base Flood Elevation value where profiles were used
Elevation in feet
*Referenced to the North American Vertical Datum of 1988

Cross section line
Transect line
Datum
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), UTM projection
UTM coordinates referenced to the North American Datum of 1983 (NAD 83), UTM projection
Elevation in feet
Elevation in feet
Elevation in feet
Elevation in feet
Elevation in feet

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Elevation in feet
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Elevation in feet



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Riverview Land Preserve
SRF Leachate Treatment Plant
FLOODPLAIN MAP

FIGURE NO.
4
PROJECT NO.
4231588

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0412E

FIRM
FLOOD INSURANCE RATE MAP

**WAYNE COUNTY,
MICHIGAN
(ALL JURISDICTIONS)**

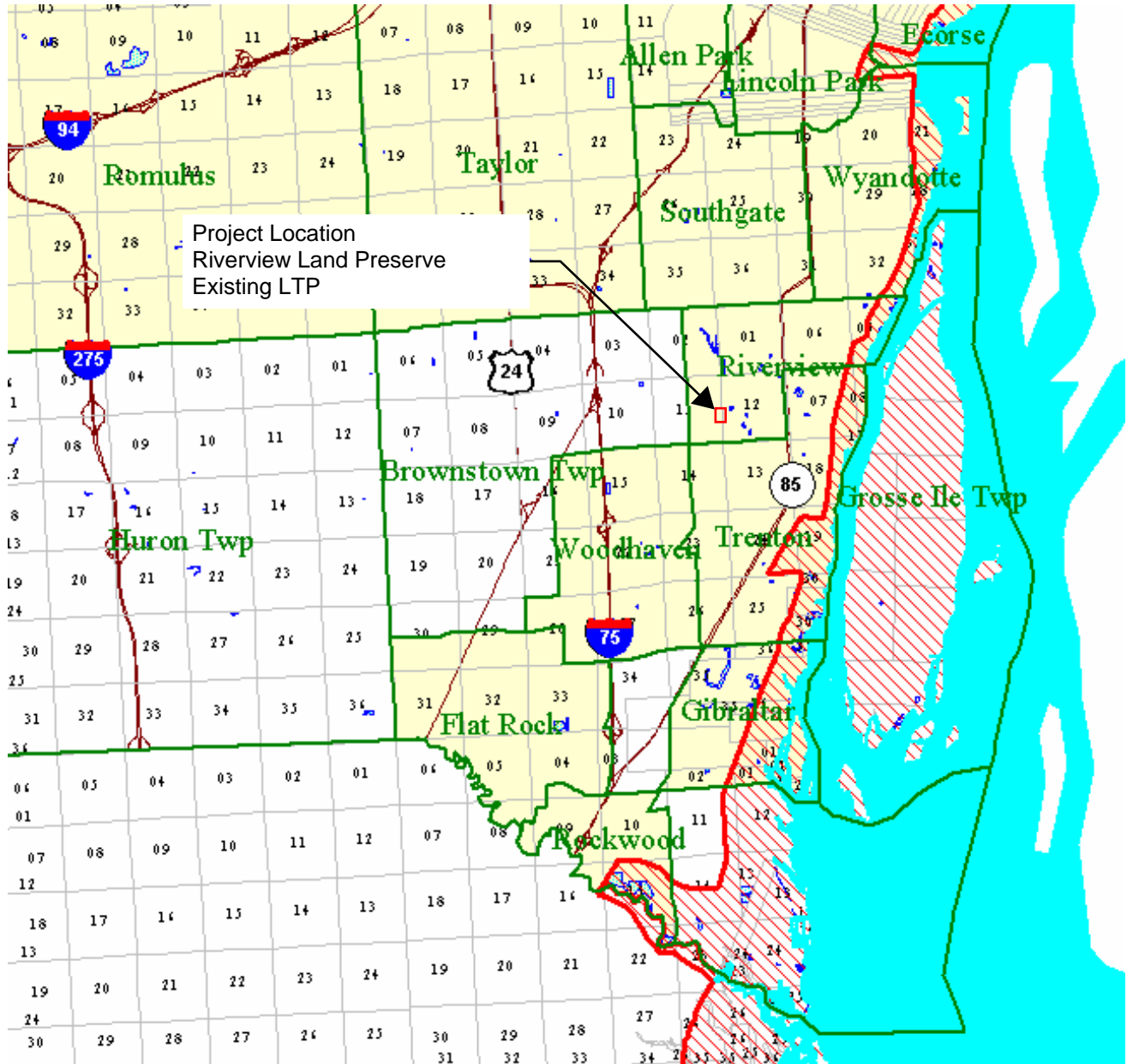
PANEL 412 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY	NUMBER	PANEL	SUFFIX
BAYVIEW-CHARLOTTE	26120	5612	E
STANFORD	26121	5612	E
WINDY HILLS	26122	5612	E
TRINITY CITY	26123	5612	E

MAP NUMBER
26130412E
EFFECTIVE DATE
FEBRUARY 2, 2012
Federal Emergency Management Agency

Wayne County
 Ecorse, Lincoln Park, Wyandotte and Riverview, T3S R11E
 Trenton, T4S R11E
 Rockwood, Gibraltar and Brownstown Township T5S R10E

The heavy red line is the **Coastal Zone Management Boundary**
 The red hatched area is the **Coastal Zone Management Area**.



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Riverview Land Preserve
 SRF Leachate Treatment Plant

COASTAL ZONES MAP

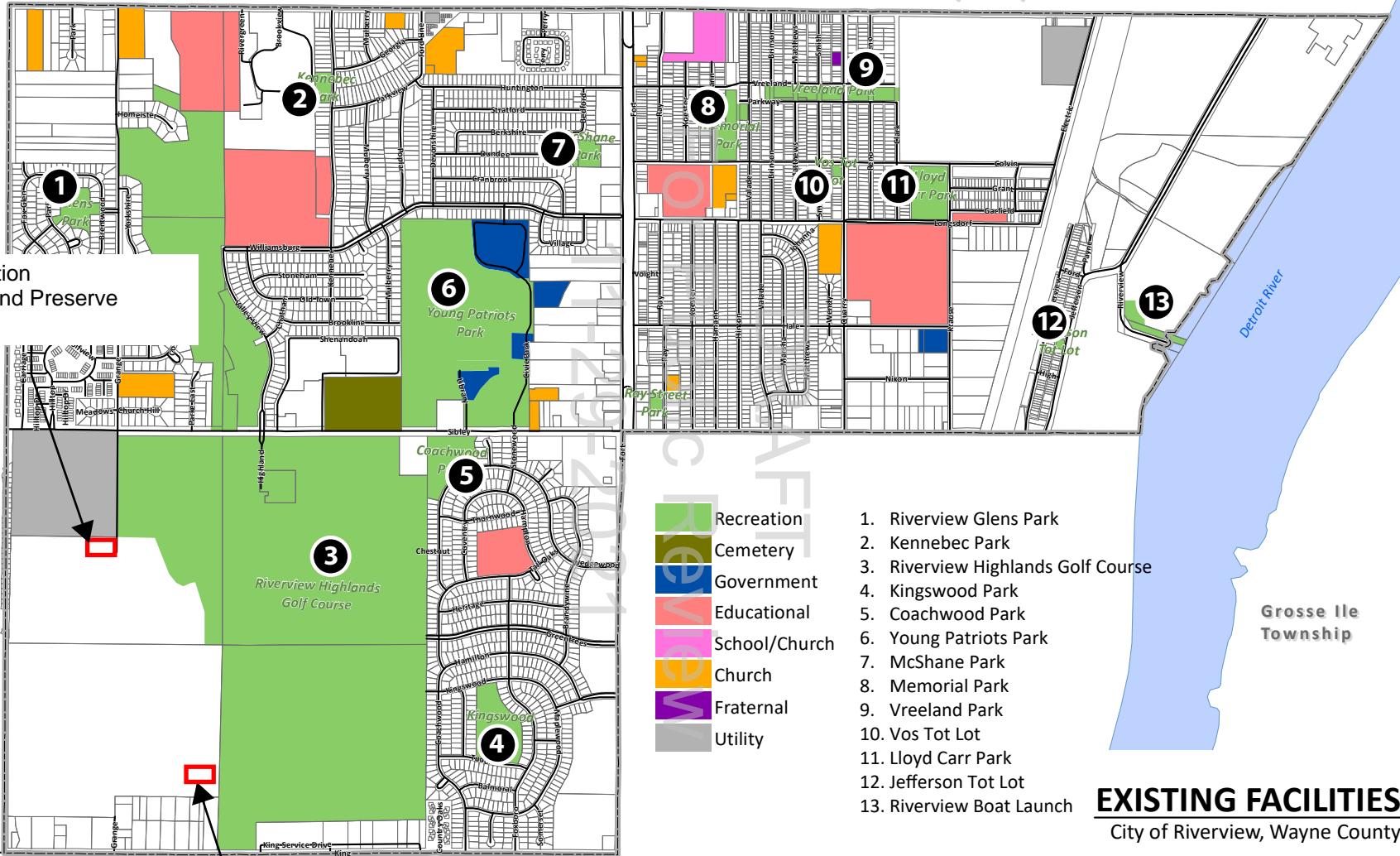
FIGURE NO.

5

PROJECT NO.
 4231588

City of Southgate

City of Wyandotte



Project Location
Riverview Land Preserve
Current LTP

Brownstown Town:

Project Location
Riverview Land Preserve
Proposed LTP Expansion

- Recreation
- Cemetery
- Government
- Educational
- School/Church
- Church
- Fraternal
- Utility

1. Riverview Glens Park
2. Kennebec Park
3. Riverview Highlands Golf Course
4. Kingswood Park
5. Coachwood Park
6. Young Patriots Park
7. McShane Park
8. Memorial Park
9. Vreeland Park
10. Vos Tot Lot
11. Lloyd Carr Park
12. Jefferson Tot Lot
13. Riverview Boat Launch

EXISTING FACILITIES

City of Riverview, Wayne County



Source: Wayne County
Carlisle/Wortman Associates
November 2021



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Riverview Land Preserve
SRF Leachate Treatment Plant
**CITY OF RIVERVIEW
RECREATION FACILITIES**

FIGURE NO.

6

PROJECT NO.
4231588



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Riverview Land Preserve
SRF Leachate Treatment Plant

TOPOGRAPHY MAP

FIGURE NO.

7

PROJECT NO.
4231588

Soil Map—Wayne County, Michigan
(Riverview Land Preserve)



USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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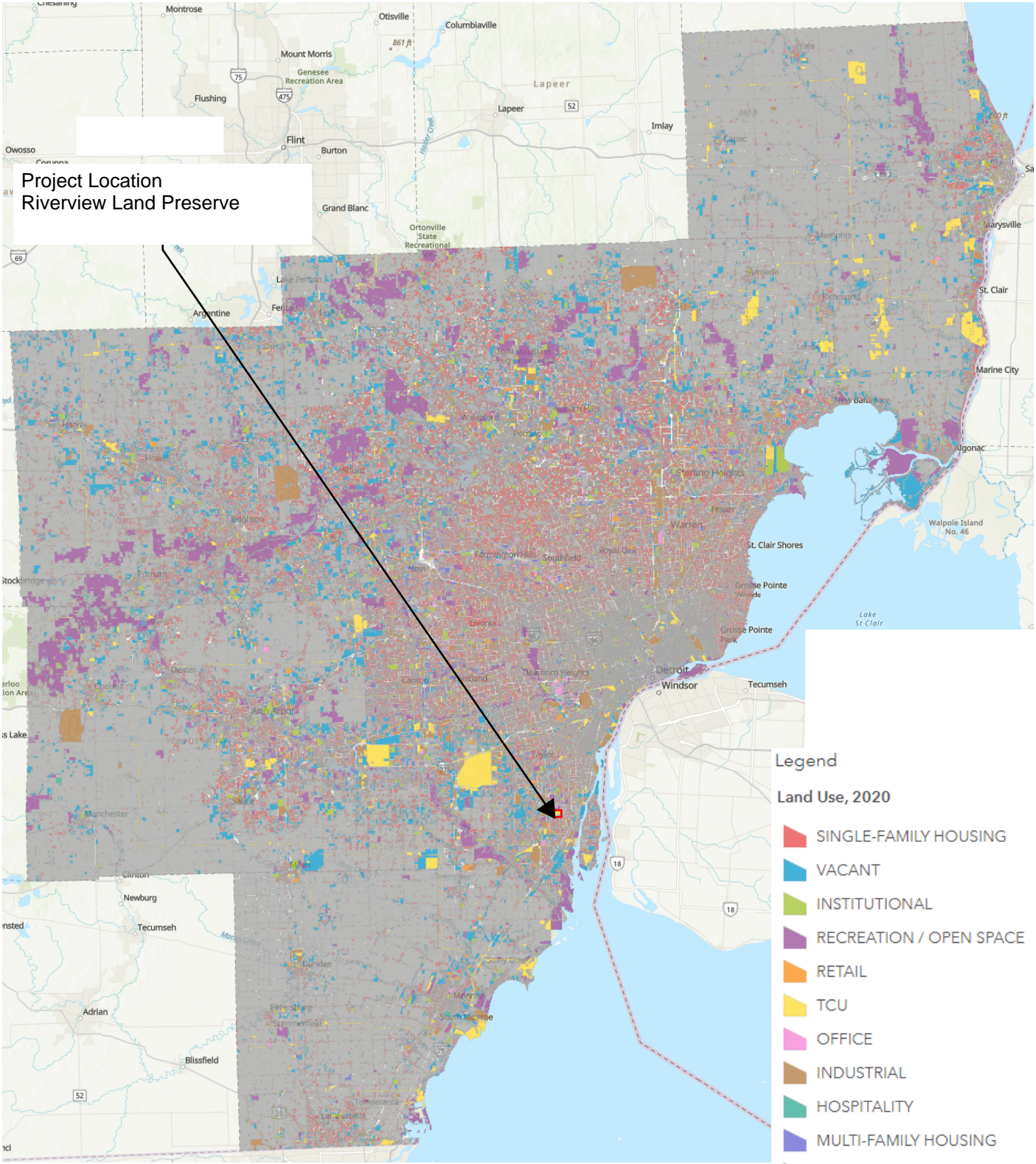
Riverview Land Preserve
SRF Leachate Facility

SOILS MAP

FIGURE NO.

8

PROJECT NO.
4231588



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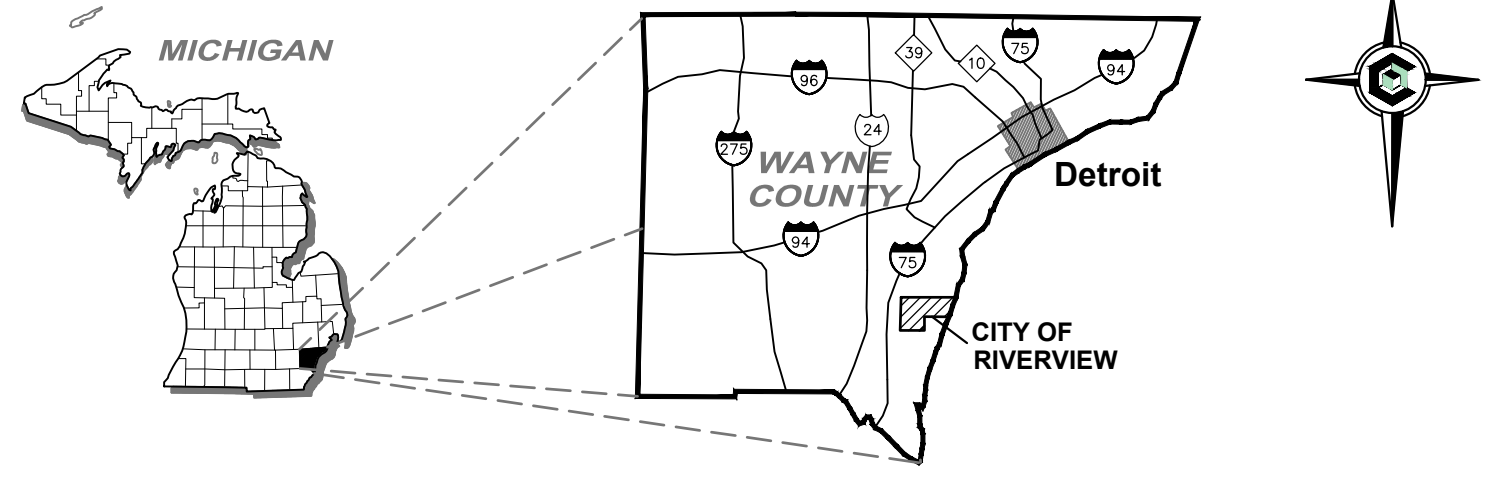
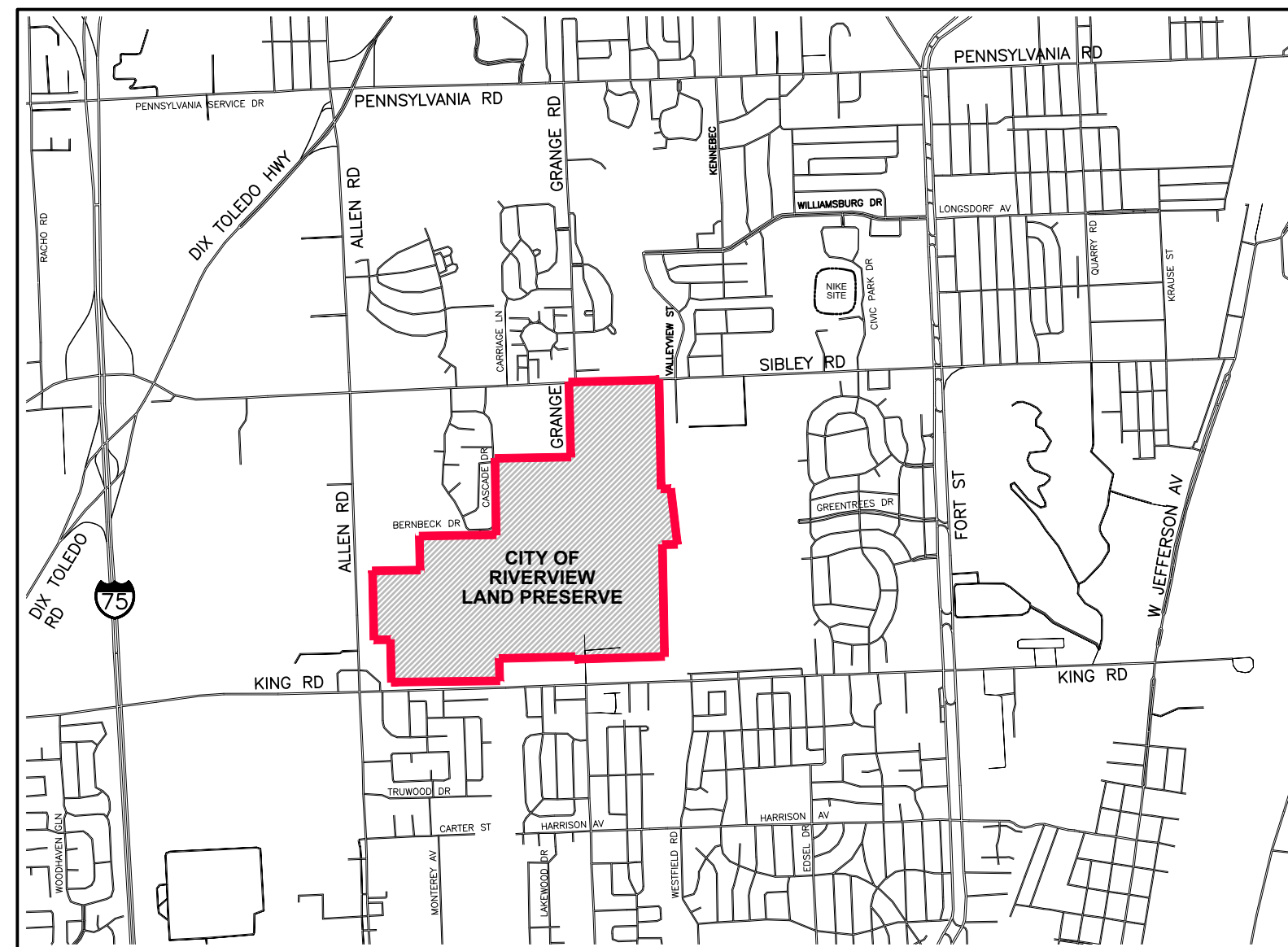


Riverview Land Preserve
SRF Leachate Treatment Plant

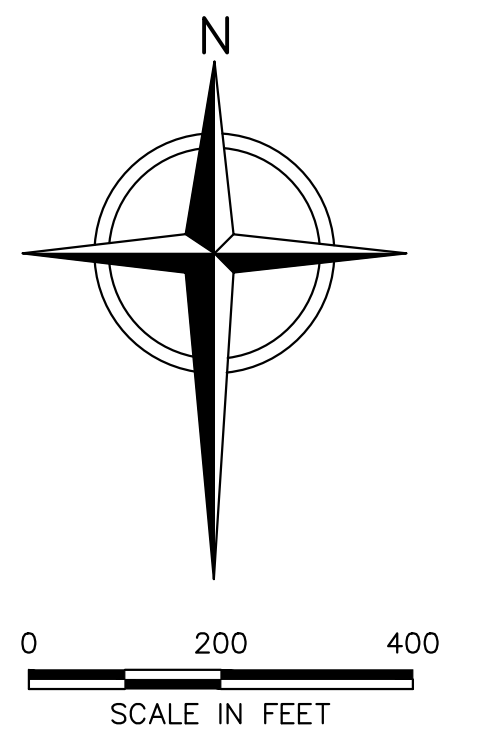
CURRENT LAND USE

FIGURE NO.
9

PROJECT NO.
4231588



LOCATION MAP



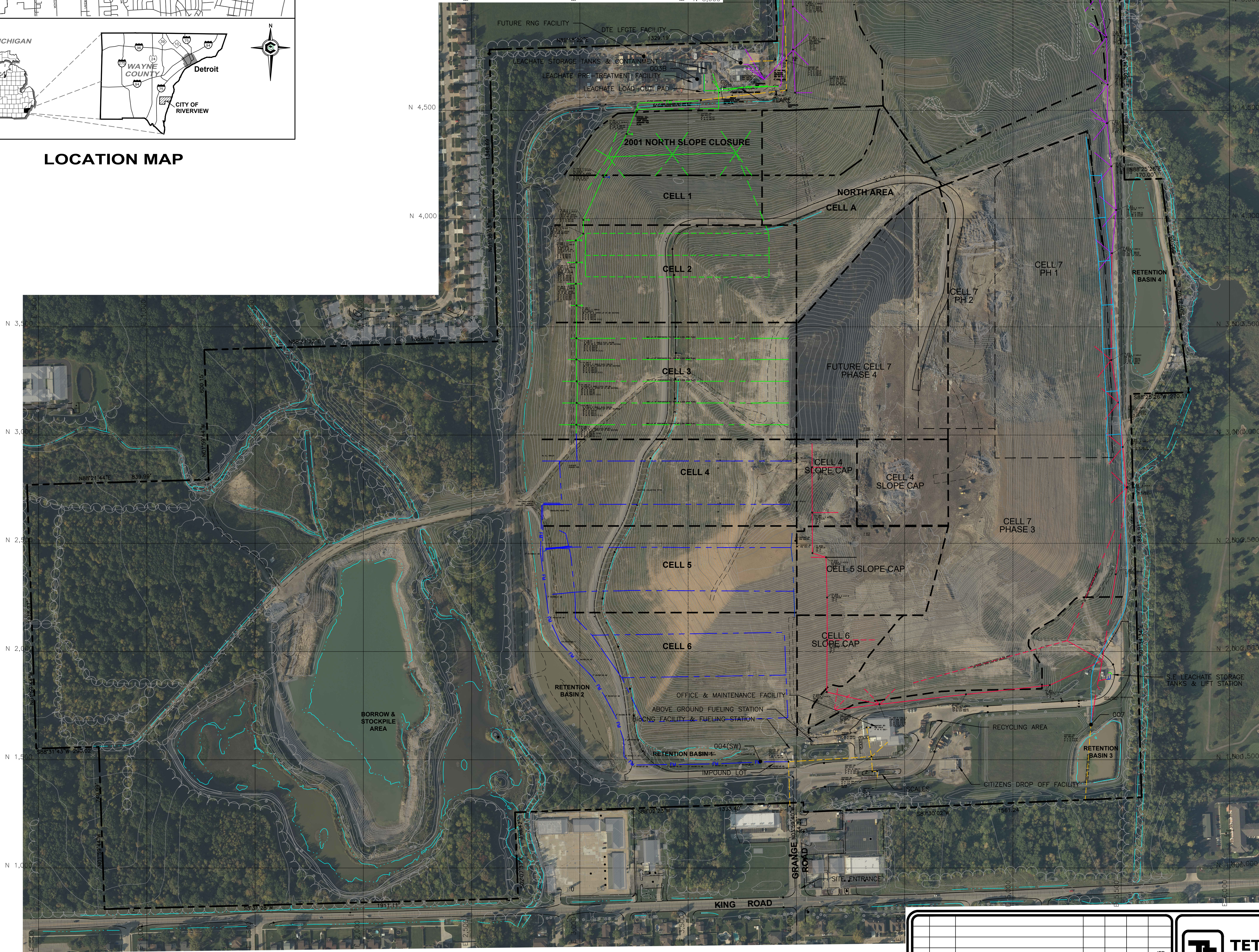
LEGEND

- FACILITY BOUNDARY
- CELL BOUNDARY
- GOLF PRACTICE FACILITY BOUNDARY
- 2001 NORTH SLOPE CLOSURE BOUNDARY
- CELL SUBSITE ACREAGE BOUNDARY
- [Symbol] BUILDING
- [Symbol] PAVED DRIVE/TRAIL
- [Symbol] UNPAVED DRIVE/TRAIL
- [Symbol] GOLF CART PATH
- [Symbol] GOLF COURSE FEATURES
- [Symbol] TREE LINE
- [Symbol] TREE
- [Symbol] PINE TREE
- [Symbol] FULL CONTROL
- [Symbol] HORIZONTAL CONTROL
- [Symbol] VERTICAL CONTROL
- [Symbol] INDEX CONTOUR
- [Symbol] INTERMEDIATE CONTOUR
- [Symbol] STREAM
- [Symbol] LAKE OR POND
- [Symbol] SWAMP
- [Symbol] FENCE
- [Symbol] GUARDRAIL
- [Symbol] SPOT ELEVATION
- [Symbol] CATCHBASIN
- [Symbol] POLE
- [Symbol] POWER POLE
- [Symbol] LIGHT POLE
- [Symbol] CULVERT
- [Symbol] MANHOLE
- [Symbol] OBJECT
- [Symbol] SIGN
- [Symbol] SIGN
- [Symbol] TANK
- [Symbol] TOWER

- NOTES:
- THE FY 2023-24 AERIAL TOPOGRAPHIC SURFACE SHOWN IS PROVIDED BY DRONEVIEW TECHNOLOGIES. DATE OF PHOTOGRAPHY: 10/01/2023.
 - EXISTING CONTOURS SHOWN REPRESENT THE 10/01/2023 SURVEY.

LEACHATE LINES

- [Line] NORTHEAST
- [Line] NORTHWEST
- [Line] SOUTHEAST
- [Line] SOUTHWEST
- [Line] CELL 7
- [Line] SANITARY

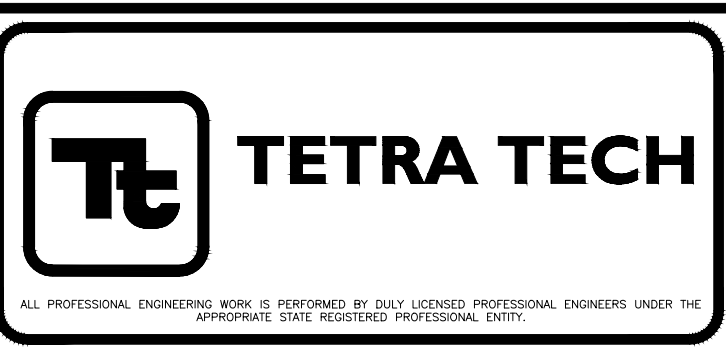


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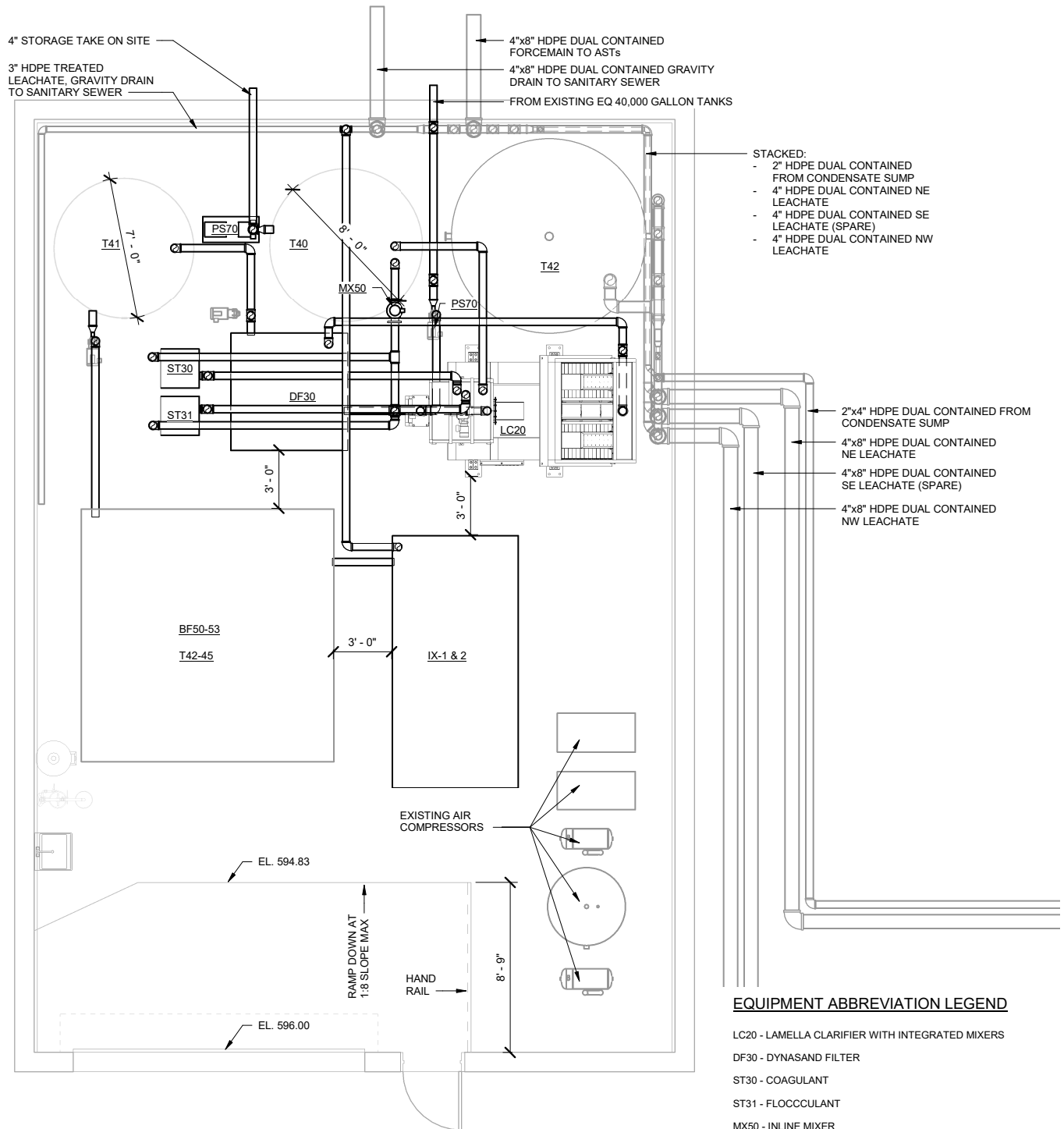
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DATE OF ISSUE	1/24/24	DRAWN BY	JTH	CHECKED BY	JEB	DESIGNED BY	JTH	APPROVED BY	JEB



Riverview Land Preserve
SRF Leachate Facility
2024 LEACHATE COLLECTION SYSTEM

SHEET NO.
10
PROJECT NO.
4221588



- STACKED:
- 2" HDPE DUAL CONTAINED FROM CONDENSATE SUMP
 - 4" HDPE DUAL CONTAINED NE LEACHATE
 - 4" HDPE DUAL CONTAINED SE LEACHATE (SPARE)
 - 4" HDPE DUAL CONTAINED NW LEACHATE

- 2"x4" HDPE DUAL CONTAINED FROM CONDENSATE SUMP
- 4"x8" HDPE DUAL CONTAINED NE LEACHATE
- 4"x8" HDPE DUAL CONTAINED SE LEACHATE (SPARE)
- 4"x8" HDPE DUAL CONTAINED NW LEACHATE

EQUIPMENT ABBREVIATION LEGEND

- LC20 - LAMELLA CLARIFIER WITH INTEGRATED MIXERS
- DF30 - DYNASAND FILTER
- ST30 - COAGULANT
- ST31 - FLOCCULANT
- MX50 - INLINE MIXER
- PS70 - DIAPHRAGM PUMP
- T46-47 - ION EXCHANGE ADSORPTION
- EQ10-11 - EXISTING TANKS (40,000 GALLONS)
- T40 - EXISTING SLUDGE SETTLING TANK (6,000 GALLONS)
- T41 - EXISTING FEED TANK (4,000 GALLONS)
- T42-45 - EXISTING GAC ADSORPTION
- BF50-53 - EXISTING BAG FILTERS

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Riverview Land Preserve
SRF Leachate Treatment Plant

**CURRENT LTP EQUIPMENT
LAYOUT AND PIPING PLAN**

FIGURE NO.

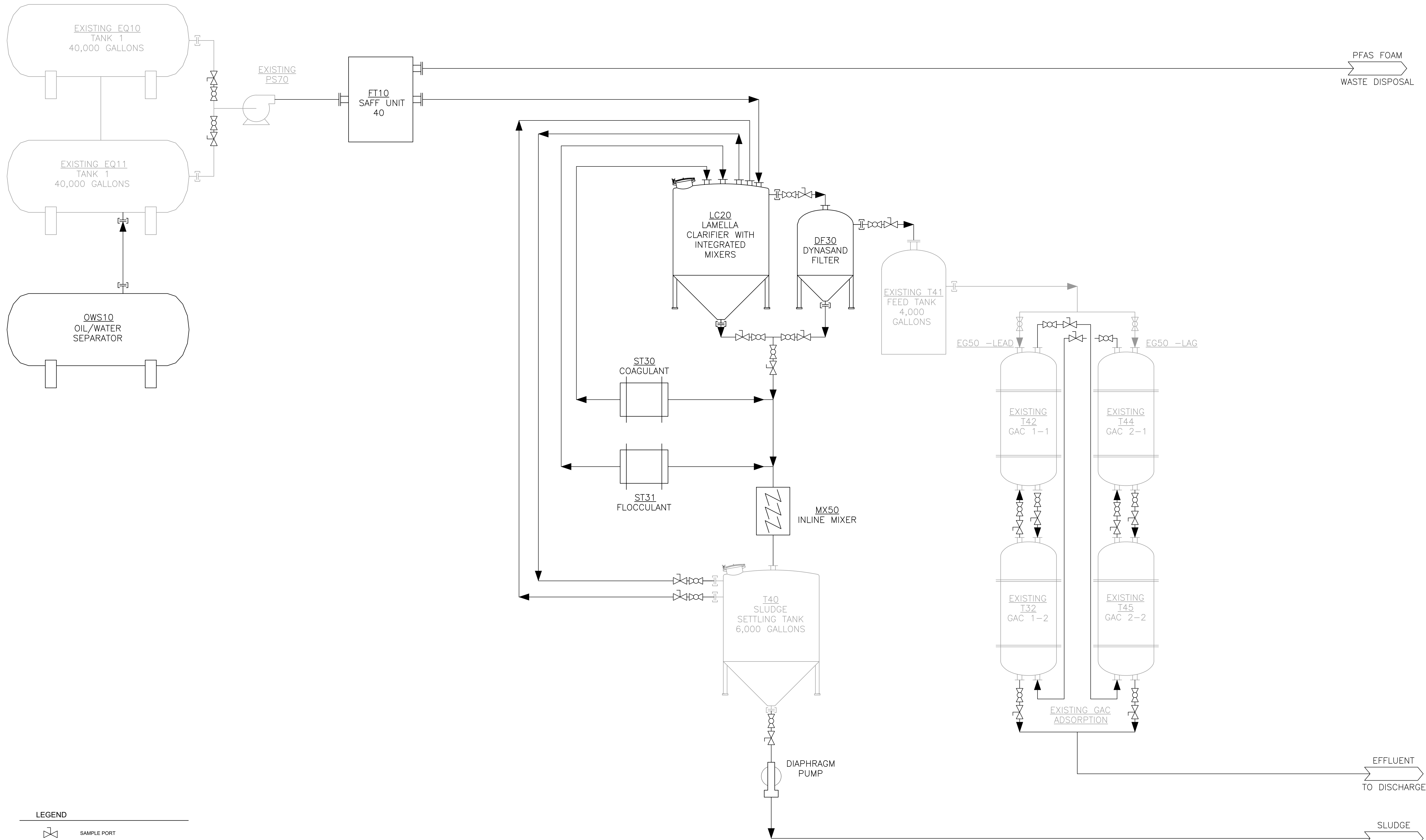
11

PROJECT NO.
4231588



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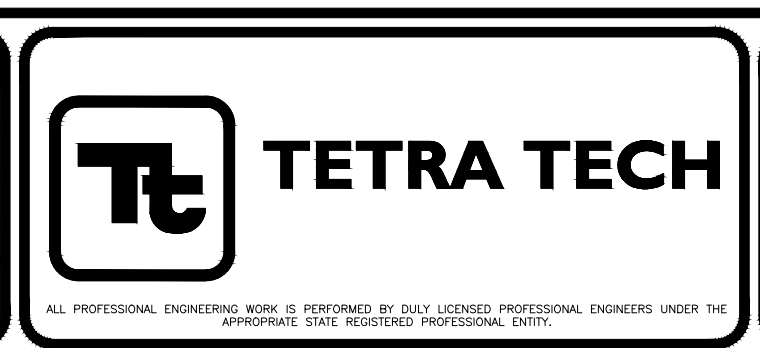
LEGEND

	SAMPLE PORT
	VALVE
	FLANGED CONNECTION
	CENTRIFUGAL PUMP
	DIAPHRAGM PUMP
	EXISTING (GRAY)
	PROPOSED (BLACK)

1" = 1/2" 0" 1"
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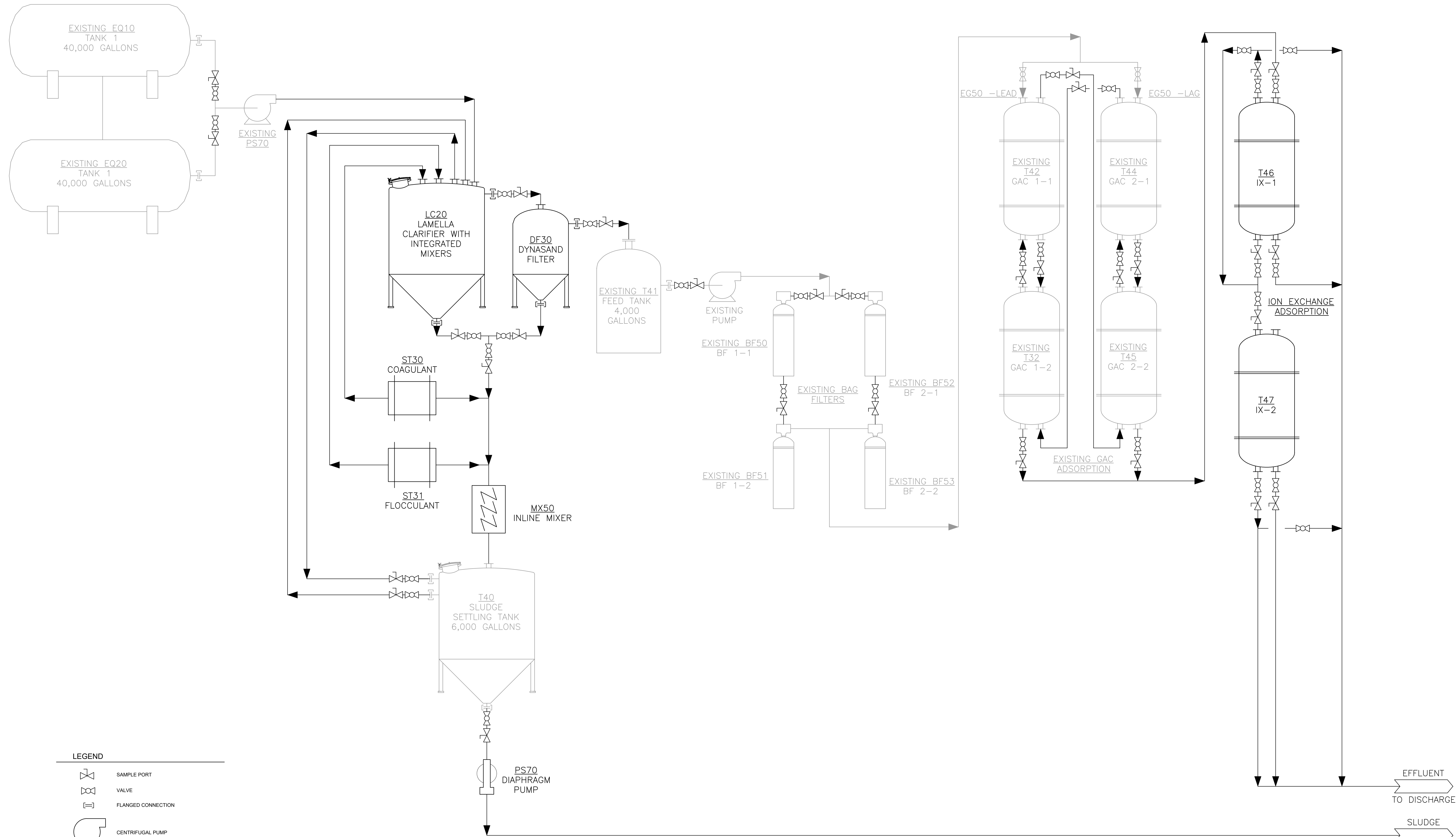
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1	MARCH 2024	DATE OF ISSUE	JLB	JP	AK	
		DESIGNED BY				
		CHECKED BY				
		APPROVED BY				





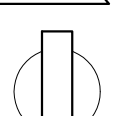




Riverview Land Preserve
 SRF Leachate Facility
PROPOSED PROCESS FLOW DIAGRAM
GAC & FOAM FRACTIONATION

SHEET NO.
12
 PROJECT NO.
 4231588



LEGEND

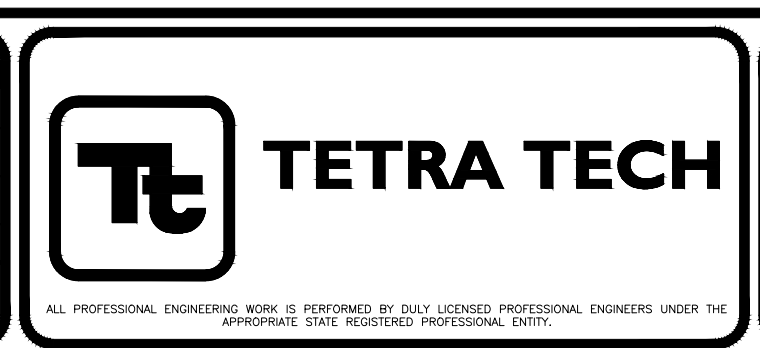
-  SAMPLE PORT
-  VALVE
-  FLANGED CONNECTION
-  CENTRIFUGAL PUMP
-  DIAPHRAGM PUMP
-  EXISTING (GRAY)
-  PROPOSED (BLACK)

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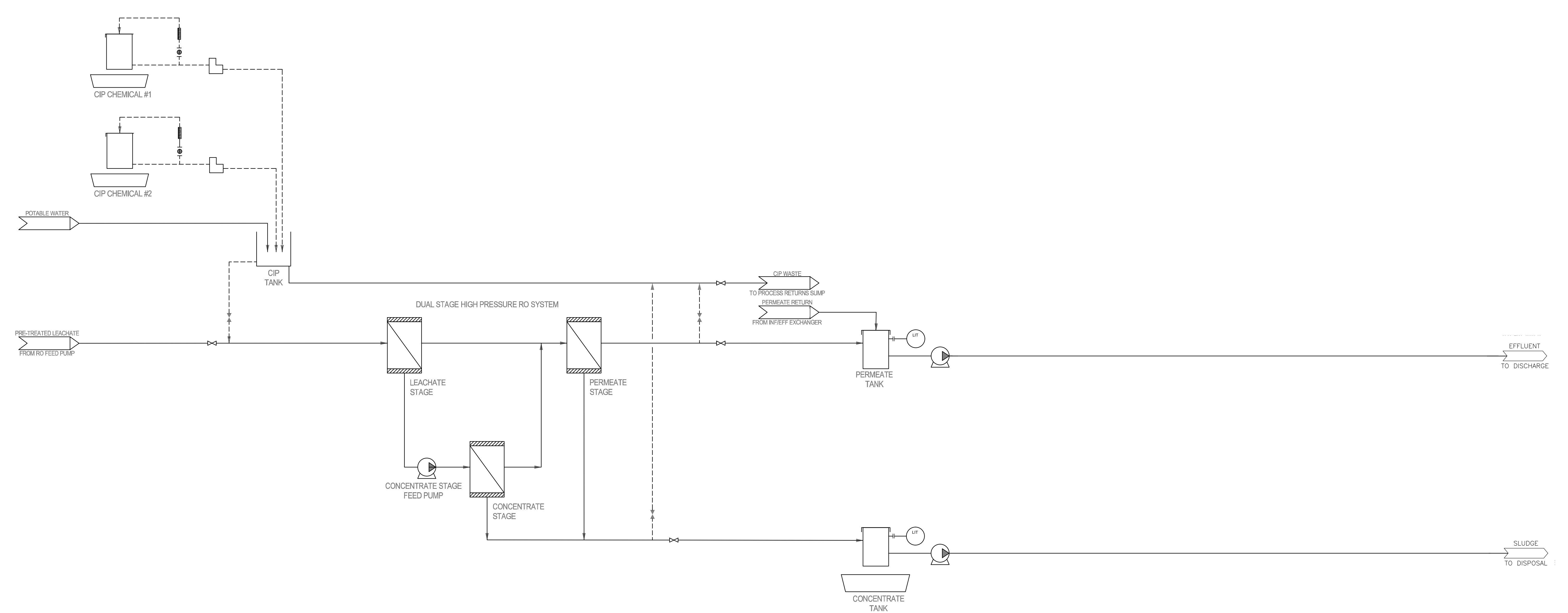
DATE OF ISSUE MARCH 2024	DRAWN BY JLB	CHECKED BY AK
DESIGNED BY JP	APPROVED BY	



Riverview Land Preserve
 SRF Leachate Facility
PROPOSED PROCESS FLOW DIAGRAM
GAC & IX ADSORPTION

FIGURE NO.
13
 PROJECT NO.
 4231588

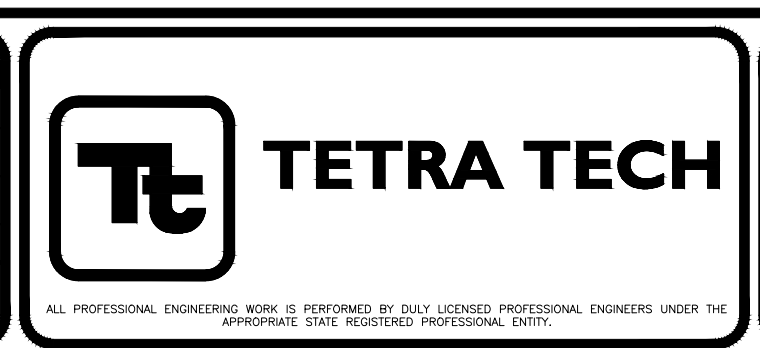
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DATE OF ISSUE	DRAWN BY	CHECKED BY
MARCH 2024	JLB	AK
	DESIGNED BY	APPROVED BY
	JP	



Riverview Land Preserve
SRF Leachate Facility

**PROPOSED PROCESS FLOW DIAGRAM
REVERSE OSMOSIS**

SHEET NO.
14
PROJECT NO.
4231588

DRAFT

APPENDIX A: DUWA IPP PERMIT, RLP OPERATING LICENSE, DUWA VIOLATIONS

DRAFT

Allen Park
Belleville
Brownstown Twp.
Dearborn Heights
Ecorse
Lincoln Park

Downriver Utility Wastewater Authority

River Rouge
Riverview
Romulus
Southgate
Taylor
Van Buren Twp.
Wyandotte

797 Central Ave.
Wyandotte, MI 48193
734-285-5500

Industrial Pretreatment Program Class D Wastewater Discharge Permit

Permit No.: D-10804
Expiration Date: 1/19/2025
Effective Date: 01/20/2020
Revision #1: 5/13/2020
Revision #2: 10/23/2020
Revision #3: 11/04/2020
Revision #4: 1/15/2021
Revision #5: 09/17/2021

In accordance with the provisions of Article IV, Section 4.02 of the Downriver Utility Wastewater Authority Sewer Use Ordinance (DUWA SUO), and pursuant to the requirements of the Industrial Pretreatment Program as specified in 40 Code of Federal Regulations (CFR) 403.8 (f)

Name and Address - Mailing	Contact Person(s):	Phone No.:
Riverview Land Preserve (RLP) 14100 Civic Park Dr. Riverview, MI 48193	Jeffrey Dobek	734.281.4263 Fax: 734.479.5960
Facility Address: Riverview Land Preserve 20863 Grange Rd. Riverview, MI 48193	Douglas W. Drysdale	734.281.4263

is hereby authorized to discharge landfill leachates and maintenance facility process waters from the above identified facility and through the outfalls identified herein into the sanitary sewer system tributary to the DUWA, Downriver Sewage Disposal System in accordance with the conditions set forth in this permit. Compliance with this permit does not relieve the permittee of its obligation to comply with any or all applicable pretreatment regulations, standards, or requirements under local, state, and federal laws, including any such regulations, standards, requirements, or laws that may become effective during the term of the permit.

Non-compliance with any term or condition of this permit shall constitute a violation of DUWA SUO. If the permittee wishes to continue to discharge after the expiration date of this permit, permittee shall apply for permit re-issuance a minimum of (90) day prior to the expiration of their existing permit, in accordance with Article IV, Section 4.03 of the DUWA SUO.

Authorization of Permit: Downriver Utility Wastewater Authority

Signature of Official


Kurian Joychan

Title: Industrial Pretreatment Program Manager

Date: 09/17/2021

Part I

A. Discharge Limitations

1. Authorized Waste streams
 - a. Permittee is authorized to discharge landfill leachate and wastewater into the sanitary Sewer system from the following areas of the landfill:

Southwest Area (SW), leachates from Cells 4, 5 and 6 is connected to treatment system. Sample point 004 is removed from permit on 4/13/2020. Sample 004 will retain the physical connection to the sewer but will be deactivated. The discharge location will be reserved for Emergency use only, subject to approval from DUWA, after submitting lab results for all parameters from sample point 004 before requesting discharge. These parameters are same as in the permit for sample point 003B. Riverview Land Preserve shall get written authorization from Control Authority prior to discharge.

Northwest Area (NW), Leachates – Cells 1, 2, 3 & A North, **Northeast and Southeast** Area (NE& SE) Leachates,

Sample Point 003B inside Treatment Bldg. north wall, discharge from carbon beds.

Southeast area Cell 7 Sample Pt. 007, discharge from valve pit to sanitary sewer at MH # 11.

Also Equipment washing station wastewater pretreated in an oil/water separator located in the maintenance building.

- i. Northeast area – 86 acres. Wastewater consists of leachates from a perimeter Collection system and gas plant condensate. Discharges to sample point 003B Pretreatment Building, carbon bed discharge.
- ii. Southeast area – 68 acres. Wastewater consists of leachates from a perimeter Collection system tributary to NE pump station through a gravity line on the east side of the landfill. Discharges to sample pt. 003B Pretreatment Building, carbon bed discharge.
- iii. Northwest area – 61 acres. Wastewater consists of leachates from Cells I, II, III And Cell A North. Leachate flows thru lateral piping for collection. Piping is Perforated. Flows to outfall 003 or underground storage tank in NE corner of NW area, sample point 003B. Treatment Bldg. carbon bed discharge
- iv. Southwest area – 50 acres, wastewater consists of leachate from Cells 4, 5 and 6. Leachate flows thru lateral piping (perforated), by gravity, to a sump at low point of cell. A submersible pump, in the sump, pumps leachate in a “side slope riser” (SSR) and into a double contained force main. Leachate is then pumped to the Treatment Building and discharged through sample point 003B.

- c. Permittee shall continue to adhere to all applicable provisions of the O & M Manual. These include maintenance of daily log sheets for all totalizing flow meters, And implementation of the final O & M manual for the Leachate Management System.
- d. In the event analytical results of sampling and analyses, performed at any of the sampling points specified in this permit, reveal the presence of PCBs, permittee shall cease discharge immediately. Resumption of discharge shall be according to A.4. Special Conditions.**

2. Sampling Locations
Sampling Points

Descriptions

003B – NW - Cells I, II, III, A North Sample port in NW Treatment Bldg. Including Northeast and Southeast area leachates. SW - Cell IV, V, VI leachate is pumped to treatment building and Carbon Treatment system and discharged through sample point 003B

007 Cell VII - Sample port on discharge line in valve pit

004 SW, Cell IV, V, VI. Sampling port in vault, approximately 500feet west of RLP office building and 33 feet North of new Grange Road and 52 feet east of transformer. When the flow is discharged through 003B, this sample point is not used for monitoring.

3. Summary Table

a. Local limits per DUWA SUO:

The pollutants listed under “Local Limitations per DUWA SUO” are reasonably expected to be present in the facility discharge at levels of concern. Therefore, the user is required to implement a self-monitoring program, as described in the summary table, to ensure compliance.

Discharge Limitations		Self-Monitoring Requirements		
Effluent Characteristic	Average Daily Concentration mg/l	Measurement Frequency	Sample Type	Sample Point
Phenolics (T)	1.0	Quarterly	Grab	003B, 007, 004
PCB's (T)	<0.0002	Monthly	Grab	003B, 007, 004
Total Suspended Solids	2,600	Quarterly	Grab	003B, 007, 004
Total Phosphorus	53.4	Quarterly	Grab	003B, 007, 004
Biochemical Oxygen demand CBOD ₅	2,200	Quarterly	Grab	003B, 007, 004
Mercury (T)	<0.0002	Quarterly	Grab	003B, 007, 004
Volatile organics Method 624	monitor only	Semi-Annual January – June &	Grab	003B, 007, 004

		July - December		
PFAS Constituents using modified 537 methodology Detection Limit 2ng/l	Report	Monthly	Grab	007, 003B, 004
Semi-volatiles Method 625	monitor only	Semi-Annual January – June & July - December	Grab	003B, 007, 004

Monitor Inlet and Outlet of the Granular Activated Carbon bed Quarterly and submit lab data along with the Periodic Compliance Report for PCB and PFAS.

Telephone at 734-285-5500, or by Fax 734-285-5248, within 24 hours of becoming aware of a violation of the permit.

All regulations regarding wastewater discharges to the DUWA Downriver Sewage Disposal Systems, set forth in Article IV and Appendix A, of the DUWA SUO, shall be conditions of this permit.

Submit PFAS Reduction Report updates with all the lab data on March 20th of each year for the period of January through March, June 20th of each year for the period of April through June and September 20th of each year for the period of July through September and December 20th of each year for the period of October through December.

4. Special Conditions (for resumption of discharge)

- a. Following special conditions shall apply for resumption of discharge from an area in which analytical results of sampling and analyses revealed presence of PCBs. The extra monitoring requirements are intended to ensure that, RLP demonstrates its ability to consistently comply with the PCBs limit and other permit limitations.
- b. Resumption of discharge shall be allowed on a batch basis in accordance with the following procedure:
 - i. Leachate shall be collected and stored in a Leachate Collection Tank.
 - ii. When the above tank is full, a representative cross sectional (core) sample shall be collected and analyzed for total PCBs. Analytical results shall be submitted to DUWA - IPP, in writing, with a request for authorization to discharge said batch.
 - iii. If the total PCBs concentration of the sample is non-detectable (N.D.) based on a detection limit (D.L.) of 0.0002 mg/l, authorization to discharge of the batch under consideration shall be granted.
 - iv. This procedure of batch discharge after verifying the absence of PCBs and obtaining appropriate authorization shall continue until RLP demonstrates its ability to consistently comply with the PCB and other permit limitations.
- c. Permittee may request resumption of direct discharge of leachate from the landfill area which previously detected PCBs in excess of the DUWA SUO and the DUWA - IPP

discharge permit upon determination that leachate in this area has met the limits for ten (10) consecutive batch discharges representing at least 100,000 gallons. The request must be submitted to DUWA - IPP, in writing, and include all analytical results, QA/QC data and chain of custody records.

DUWA - IPP shall promptly review the request and issue a decision in writing, within 14 business days of the receipt of said request. Resumption of direct discharge shall not commence without written authorization (FAX is acceptable) from DUWA - IPP.

- d. Permittee shall commence discharge to the sanitary sewer system in accordance with the initial sampling period below.
- e. Initial Sampling Period first 14 discharge days (upon commencing discharge).

Discharge Limitations		Self-Monitoring Requirements		
Effluent Characteristic	Average Daily Concentration mg/l	Measurement Frequency	Sample Type	Sampling Point
PCBs (T)	<0.0002	see below	Composite	appropriate sampling point(s)

* See Attachment A, Appendix A for explanation of quantification levels and Matrix Interferences.

Measurement Frequency

For the first 14 discharge days (initial sampling period), discharge from each area shall be sampled and analyzed for total PCBs as follows:

For the first fourteen (14) discharge days, sampling shall be conducted each discharge day.

- f. Thereafter, sampling shall be in accordance with discharge limitations listed in A3(a).

During the initial sampling period, sampling and analysis shall be conducted at the expense of RLP.

PCB sampling shall consist of a time- weighted composite sample collected during each discharge interval. Total Phenolics sampling shall consist of a grab sample collected at the beginning of each composite period.

Sampling and analyses results shall be provided within 24 hours of sampling. The contracted laboratory shall send the analytical results simultaneously to DUWA and to RLP.

B. Self-Monitoring Conditions:

- 1. Definitions
 - a. Maximum Monthly Average Limit – The maximum allowable value for the arithmetic average of all samples collected during one (1) calendar month.

- b. Daily Maximum Limit – the maximum allowable discharge of a pollutant during a calendar day. Where daily maximum limitations are expressed in mass units, the daily discharge is the total mass discharged during the course of a day. Where daily maximum limitations are expressed in units of concentration, the limitation is the arithmetic average value of all samples collected during the day.
- c. Average Daily Concentration Limit – The highest allowable value expressed in concentration units. The limit is the arithmetic average of all samples collected during that day. It applies to all parameters with the exception of pH.
- d. Daily Minimum Limit – The minimum allowable concentration of a pollutant, allowed to be discharged in a calendar day. This term usually applies to pH, where it is the lowest pH measurement determined from the analysis of number of grab samples collected, independent of the industrial flow rate and the duration of the sampling event.

2. Analytical Procedures

Analytical procedures for all analyses of pollutants to determine compliance shall be in accordance with 40 CFR Part 136, except for PFAS analysis as mentioned in Part I Section A.3.B. PFAS analysis is to be performed in accordance with State of Michigan DEQ IPP PFAS INITIATIVE recommendations, and as advised in this permit.

3. Representative Sampling

The samples and measurements that are taken as a result of requirements in this permit must be representative of the effluent being discharged during a typical workday.

4. Sample Type

Grab – an individual sample collected over a period of time not to exceed 15 minutes, which reasonably reflects the characteristics of the wastestream at the time of sampling. Request for Grab sample was received on September 16, 2021 and approved by DUWA on September 16, 2021.

Composite – a sample comprised of individual grab samples collected at regular intervals, on a time proportional basis, over a specified period which provides a representative sample of the average stream during the sampling period.

5. Sample Point

Compliance sampling shall be performed at the sampling location identified in Part 1 A.2 and Attachment C. Sample locations are not to be changed without prior written approval from the DUWA –IPP Section.

6. Sample Frequency

The effluent must be sampled and analyzed at the frequency indicated in the summary table above. This applies for all the parameters shown in the table.

7. Greater Sampling Frequency

If the permittee or its agent, samples and monitors any pollutant using EPA approved procedures, at the sampling point(s) described in this permit, more frequently than

required, then the results of this sampling and monitoring must be included in the Periodic Compliance Report. Permittee must calculate and report average values in the Report, taking the additional sampling and monitoring into account.

8. **Non-compliance Additional Sampling**
If a permittee is in non-compliance and subject to enforcement actions, additional self-monitoring may be required. The additional self-monitoring may be required until such time as the permittee can demonstrate compliance.

C. Charges and Fees

1. **Surcharge**
Carbonaceous Biochemical oxygen demand, 5-day (CBOD5), total suspended solids (TSS), and Total phosphorus are surchargeable parameters. If the discharge contains concentrations of these compatible pollutants in excess of the allowable concentrations (BOD=275mg/l and TSS=350mg/l, and T. phosphorus=6mg/l) the permittee must pay a surcharge on the excess amount. The permittee may elect to do monthly self-monitoring of these parameters and have the results included in the determination of the surcharge and must then comply with the surcharge policy of the DUWA.
2. **Industrial Surveillance Fee**
The permittee shall pay directly to the DUWA, an Annual Industrial Surveillance Fee calculated pursuant to formula listed in Attachment B, and billed by the DUWA on a quarterly basis

D. Reporting

1. **Periodic Compliance Report (PCR)**
The permittee shall report self-monitoring and flow rate data to DUWA – IPP on a quarterly basis. The PCR shall consist of a summary of data on the PCR form and copies of the analytical reports, including chain of custody forms and quality assurance/quality control (QA/QC) data. The report shall be received by the end of business day on the 15th day of the month following the end of the reporting period (January 15, April 15, July 15 and October 15).
2. **Volatile and Semi-Volatile Organics**
The permittee shall self-monitor for volatile organics during 2nd and 4th quarters and for semi-volatile organics during the 2nd quarter at the designated sample points. Results shall be included with the respective PCR.
3. **Slug / Spill Control Plan**

Industrial Users shall provide protection from accidental discharges of substances which may cause interference at the Downriver Sewage Disposal System pursuant to Article IV, Section 2.04 of the DUWA SUO. The 2008 Integrated Contingency Plan as amended.

The plan shall be implemented by the user to address notification, slug or spill prevention, containment, spill cleanup and employee training and submit it to the IPP Section for approval prior to construction. Approval of such plans shall not relieve the industrial user from complying with laws and regulations governing handling of hazardous substances. Any required facilities shall be provided and maintained at the user's expense. Significant Industrial Users are required to notify DUWA-IPP immediately of any changes at its facility affecting the potential for a slug discharge.

Leachate Flow Records

Permittee shall submit daily log sheets (Form # 201) showing all discharge and recirculation totalizing flow meter readings and valve directions on a quarterly basis. These records shall be submitted no later than the 15th day following the end of each quarter.

Volume Reporting

Permittee shall report the volume discharged, for billing purposes, on a monthly basis to the city of Riverview finance department, on a quarterly basis to DUWA-IPP Section.

4. **Signatory Requirements for Reports**

The PCR's shall include the certification statement pursuant to Article IV, Section 5.04 of the DUWA SUO and shall be signed by an authorized representative of the industrial user per Article I, Section 1, Definition 5, of the DUWA SUO.

5. **Total Phenolics and PCB Results**

Analytical reports of self-monitoring for total Phenolics and PCB's during the initial Sampling Period (Part I.A.4.e.) shall be submitted to DUWA – IPP Section within 24 hours of sampling.

E. Enforcement Orders

This permit contains specific discharge limitations, effective dates, self-monitoring, reporting and terms and conditions for your facility.

Please note that any and all penalties, compliance schedules, compliance agreements, and/or Administrative Orders previously issued or agreed to as a result of violations by the permittee, prior to the issuance of this permit, remain in full force and effect.

Part II

A. General Terms and Conditions

1. Right of Entry

The permittee shall allow DUWA representative, upon the presentation of credentials, access at all reasonable times to all parts of the premises for the purposes of inspection, observation, sampling, examining records, copying records, conducting an investigation, or the performance of any of their duties related to the administration of this permit and/or the DUWA's Industrial Pretreatment Program (IPP). Denial of entry shall constitute a violation of the Regulation and subject the user to enforcement action.

2. Retention of Records

a. The permittee shall keep records and make available upon request of the DUWA, State of Michigan, or EPA for at least three (3) years, of the following:

- i. All monitoring information – includes all calibration and maintenance records.
- ii. All correspondence related to monitoring, sampling and analyses related to its discharge, including Best management Practices, if applicable.
- iii. Copies of all reports required by this permit.
- iv. Records of all data used to complete the Industrial-Commercial Waste Questionnaire, which serves as the application for this permit.

b. All records that apply to matters that are the subject of special orders or any other enforcement or litigation activities brought about by DUWA shall be kept and preserved by the permittee until all enforcement activities have concluded. Also, until all periods of limitation regarding appeals have expired.

3. Fines and Penalties for Violations of Permit Conditions

a. Municipal Civil Infractions

DUWA adopted a Municipal civil Infractions Regulation to designate certain violations of the Sewer Use Regulation as municipal civil infractions rather than criminal misdemeanors. The sanction for a violation shall be civil fine in the amount provided by schedule of civil fines contained in Article IV, Section 6.10.2

b. Criminal Penalties

Any person who is convicted of a violation of State law or DUWA SUO, as per Article IV, Section 6.12 shall be guilty of a misdemeanor and punishable by a fine of \$500.00, per violation per day or imprisonment for up to 90 days, or both, at the discretion of the court.

If a violation is committed by a person whom acts or fails to act on behalf of a corporation or partnership, that person shall be held personally liable for fine or imprisonment of both.

4. Fee and Charges

The permittee shall pay fees and surcharges including late fees and interest, directly to the DUWA for at least the following:

- a. Annual Industrial Surveillance fees.
- b. Surcharges for compatible pollutants discharged in excessive concentrations as detailed in Article IV, Section 3.04.
- c. To recover actual additional costs it may incur in connection with inspecting and enforcement, implementation of the IPP, sampling, testing, handling and treating the wastes not covered by existing wastewater charges in addition to the Annual Industrial Surveillance fee referred to above.
- d. Cost of handling and treating wastewater into the sewer not otherwise provided.

The above charges and fees are separate from any sewage or excess sewage fees collected pursuant to Michigan Public Act 185 of 1957.

5. Additional Sewer Information

The permittee shall agree to furnish the DUWA, upon request, any additional information relating to the installation or use of the sewer.

6. Pretreatment Facilities

- a. Operation: The permittee shall provide, operate and maintain any industrial wastewater pretreatment facilities, as may be required by this permit, in an efficient manner at all times, and at permittee expense.
- b. Detailed plans and operating procedures for new pretreatment facilities must be submitted for review and approval, prior to construction. Submit plans to the DUWA, at the address on the cover sheet of this permit.
- c. Any subsequent changes in pretreatment facilities or operating procedures must be reported to the DUWA for review and approval, prior to initiation of the changes.

7. Slug/Spill Control Plan

Industrial Users shall provide protection from accidental discharges of substances, which may cause interference at the Downriver Sewage Disposal System pursuant to Article IV, Section 2.04 of the DUWA SUO. Where necessary, spill prevention or slug control plans shall be developed by the user to address notification, slug or spill prevention, containment, spill cleanup and employee training and submit it to the IPP Section for approval prior to construction. Approval of such plans shall not relieve the industrial user from complying with laws and regulations governing handling of hazardous substances. Any required facilities shall be provided and maintained at the user's expense.

B. Notification Requirements

Emergency notification telephone numbers:

Office	Phone	Fax
IPP Section (M-F, 7am – 3:30pm)	734.285.5225	734.285.5248
DSDS WWTP (M-F, 7 am – 3:30 pm)	734.285.5500	734.285.5248
DSDS Shift Supervisor (24/7)	313.213.5107	
24-Hour Hot Line (24/7)	1.888.223.2363	

1. Self-Monitoring Violations

If the results of the permittee’s self-monitoring indicates that a violation of this permit has occurred, the permittee must, in accordance with 40 CFR 403.12(g)(2):

- a. Inform the DUWA by telephone, fax, or e-mail within 24 hours, of becoming aware of the violation, and
- b. Repeat the sampling and pollutant analysis and submit, in writing, to the DUWA-IPP Section the results of this second analysis within thirty (30) days of the first violation, except if:
 - i. The DUWA representative performs sampling at facility at least once per month.
 - ii. The DUWA representative performs sampling between the time the permittee performs initial sampling and the time when permittee receives results of this sampling.

2. By-Pass Notification

By-pass of pretreatment facilities necessary to maintain compliance with all the requirements of this permit is prohibited, unless:

- a. By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage.
- b. There were no feasible alternatives to the by-pass.
- c. The permittee submitted notices as required per Article IV, Section 2.05.6(b) of the Sewer Use Regulation.
- d. The DUWA representative may approve an anticipated by-pass, after considering its adverse effects, if the DUWA representative determines that it will meet the three (3) conditions listed in Article IV, Section 2.05.6(c)(1) of the Sewer Use Regulation.

3. Slug / Spill Notification

The permittee shall within one hour, of becoming aware, report any spill or slug which may cause increased pollution of normal industrial and/or sanitary waste-water. Call DUWA representative at 734-285-5500 and report the: 1) location of discharge, 2) date and time of discharge spill or slug, 3) type of waste, 4) concentration and volume of the spill or slug, and 5) describe the corrective actions taken to prevent future spill or slug discharges.

If a major spill occurs that may impact storm sewers or open waterways, call the Michigan Department of Environmental Quality (MDEQ), at 1-800-292-4706 and report the spill.

Written notification is required to the DUWA Representative within five (5) days pursuant to Article IV, Section 2.05.2(b).

A slug is defined as any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge, which has a reasonable potential to cause Interference or Pass Through, or in any way violate the POTW's regulations, local limits or permit conditions.

4. Upset Non-Compliance

- a. The permittee shall notify the DUWA by phone, within 24 hours of first becoming aware, that a process upset has occurred, which places that discharger in non-compliance with the DUWA SUO or with a condition of its Class D Wastewater Discharge Permit. "Upset" is defined as an exceptional incident in which there is unintentional and temporary non-compliance with technology based permit discharge limitations because of factors beyond the reasonable control of the Industrial User. The permittee shall submit to the DUWA a written notification within five (5) days, which specifies the following:
 - i. A description of the Upset to sanitary sewer, its cause, and impact relative to compliance status.
 - ii. The duration of non-compliance, including exact dates and times or, if not corrected, the anticipated time necessary to come back into compliance.
 - iii. Steps being taken and/or planned to reduce, eliminate and prevent recurrence of that type of Upset, or other conditions of non-compliance.
- b. An Upset shall constitute an affirmative defense to an action brought for non-compliance with Categorical Pretreatment Standards, if the requirements of the Michigan administrative Code R 323.2303(3) are met.
- c. In any enforcement proceedings the permittee seeking to establish the occurrence of an Upset shall have the burden of proof.
- d. The permittee shall control production or all discharges to the extent necessary to maintain compliance with Categorical Pretreatment Standards and/or Local Limits upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the

situation where, among other things, the primary source of power of the treatment facility is reduced, lost or fails.

5. Notification of Changed Discharge

Permittee shall promptly notify the DUWA representative in advance of any substantial change in the volume or character of pollutants in its discharge including all of the following, if applicable:

- a. Groundwaters that are purged for remedial action programs.
- b. Groundwaters containing pollutants that infiltrate into the sewers.
- c. The listed or characteristic hazardous wastes for which the User has submitted initial notification pursuant to Article IV, of the Sewer Use Regulation.

(a) Permit Items

1. Permit Re-issuance

- a. Re-application
The permittee must submit an application for permit re-issuance, in the form of a completed, updated, Industrial-Commercial Waste Questionnaire, to the DUWA no later than 90 days prior to the expiration date of the permit.
- b. Re-Issuance
Upon timely application for re-issuance of a permit in accordance with paragraph a, the expired permit shall be automatically extended until a final decision regarding the application is made by the DUWA representative.

2. Permit Modification

The DUWA representative may modify a Wastewater Discharge Permit in order to:

- a. Require compliance with national Categorical Pretreatment Standards.
- b. Assure compliance with the publicly owned treatment works (POTW) NPDES Permit.
- c. Incorporate new conditions or parameter of concern due to substantial change in the User's operations or new information concerning existing conditions.
- d. Incorporate changes in federal or state laws or changes in the DUWA's approved IPP.
- e. Change or terminate special conditions of the permit including but not limited to monitoring frequency or parameters to be monitored.
- f. Correct any omissions or typographical errors.
- g. Reflect changes in the monitoring location.
- h. To address a User's noncompliance with portions of an existing permit.
- i. For any other reason, if the DUWA representative reasonably believes the modification is necessary to ensure either that the POTW complies with its NPDES permit or that the POTW does not negatively affect the receiving

water quality standards, the national air quality standards or any other applicable permit, order, statute, regulation, or limitation.

The permittee shall be given written notice of any proposed changes in its permit, at least 30 days prior to the effective date of such change, unless a shorter time is necessary to protect the treatment plant, protect human health or the environment.

3. Permit Transfer

Wastewater Discharge Permits are issued to a specific user for a specific operation and shall not be assigned or transferred to another discharger or to another location without 30 days prior notice to the DUWA representative of the change and the written approval of the DUWA representative.

4. Permit Revocation

The DUWA representative may, with written notice revoke the discharge permit for the following reasons:

- a. Violation of the terms and conditions of the permit, local Ordinances, State and Federal laws, Statutes, and Regulations.
- b. Failure to factually report the wastewater constituents and characteristics of the discharge.
- c. Failure to report significant changes in wastewater constituents and characteristics.
- d. Refusal of reasonable access to the permittee's premises by DUWA representative for the purpose(s) of inspection or monitoring.
- e. Failure to pay fines, penalties or costs incurred by the DUWA, pursuant to Article IV., Section 6.

Non-compliant Industrial Users shall be notified of the proposed termination of their Wastewater Discharge Permit and be given an opportunity to show cause under Section 6.04.1 of this Regulation why the proposed action should not be taken.

5. Emergency Suspension of Service and Discharge Permits

- a. The DUWA representative may, for good cause, suspend the wastewater treatment service and the Wastewater discharge Permit of a discharger if the DUWA representative finds that an actual or threatened discharge presents or may present an imminent or substantial danger to the health or welfare of persons, substantial danger to the environment, or an interference or passthrough.
- b. A discharger who is notified of the suspension of wastewater treatment service and/or the Discharger's Wastewater discharge Permit, shall within a reasonable period of time, as determined by the DUWA representative, cease all discharges.
- c. If a discharger fails to comply voluntarily with the suspension order within the specified time, the DUWA representative shall take such steps as deemed

necessary, including severance of the sewer connection, to prevent or minimize damage to the POTW, its receiving waters, or endangerment to any individual.

- d. The DUWA shall allow the User to recommence its discharge when the user has demonstrated to the DUWA's satisfaction that the endangerment has passed, unless termination proceedings are initiated against the user.
- e. A User that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a full report to the DUWA representative within five (5) days of the incident. This report shall be a detailed written statement describing the causes of the harmful contribution and the measures taken to prevent any future occurrence. The information in this report shall be considered during any related action by the DUWA representative.
- f. Local communities whose wastewater is transported or treated by the facilities of the DUWA may join with the DUWA representative in enforcement action and take such other action to effectuate the Regulation.
- g. Failure of the contracting community to join in the enforcement action shall not limit the DUWA's representative to enforce this Regulation and the provisions of this section as to any discharger.

Riverview Land Preserve

Sample Point 001, 002, 003, 004

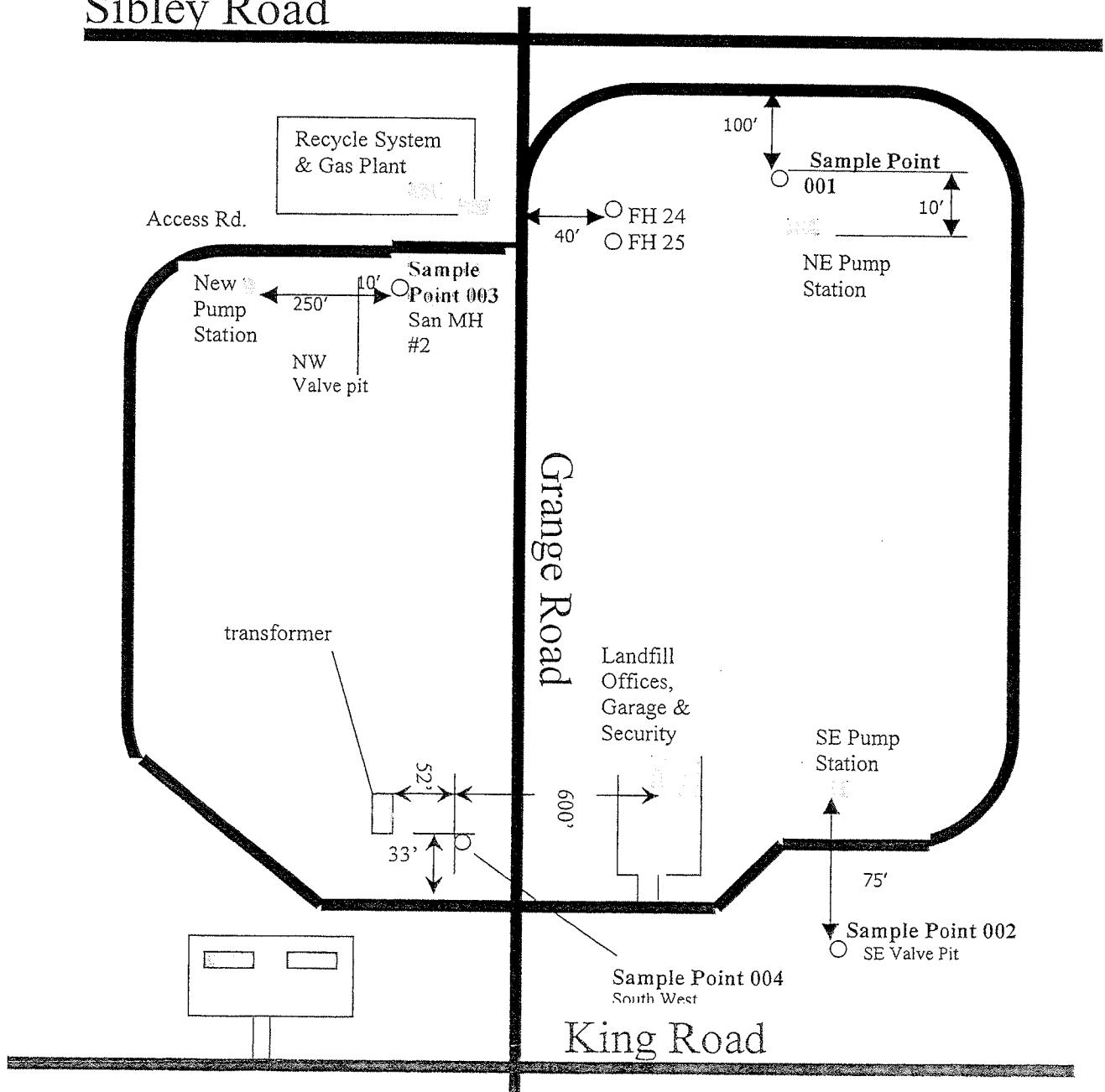
Attachment C

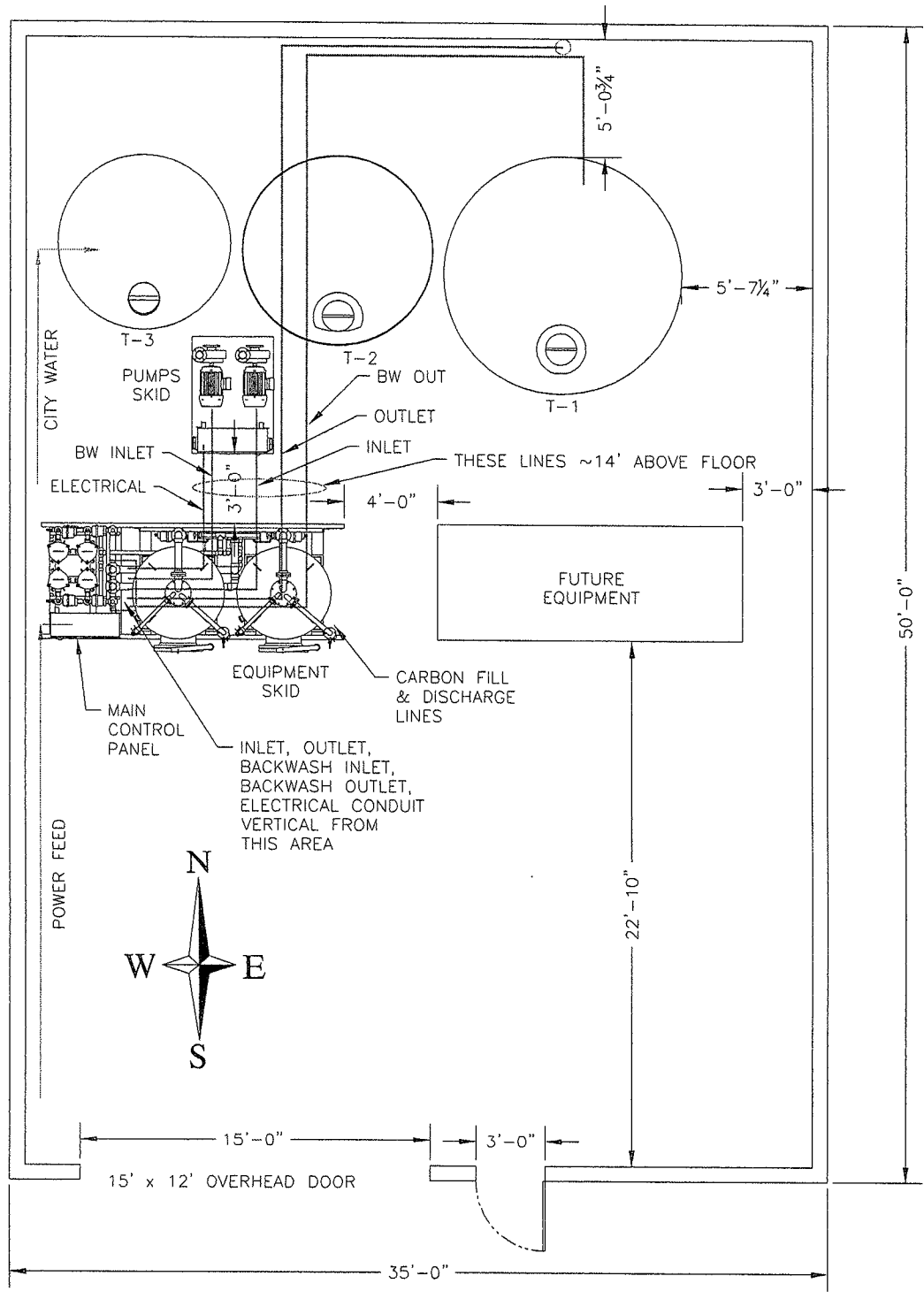
MLF 5/30/03

Permit No. 10804

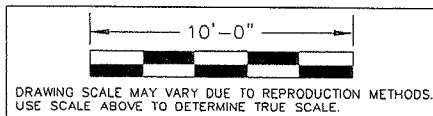


Sibley Road

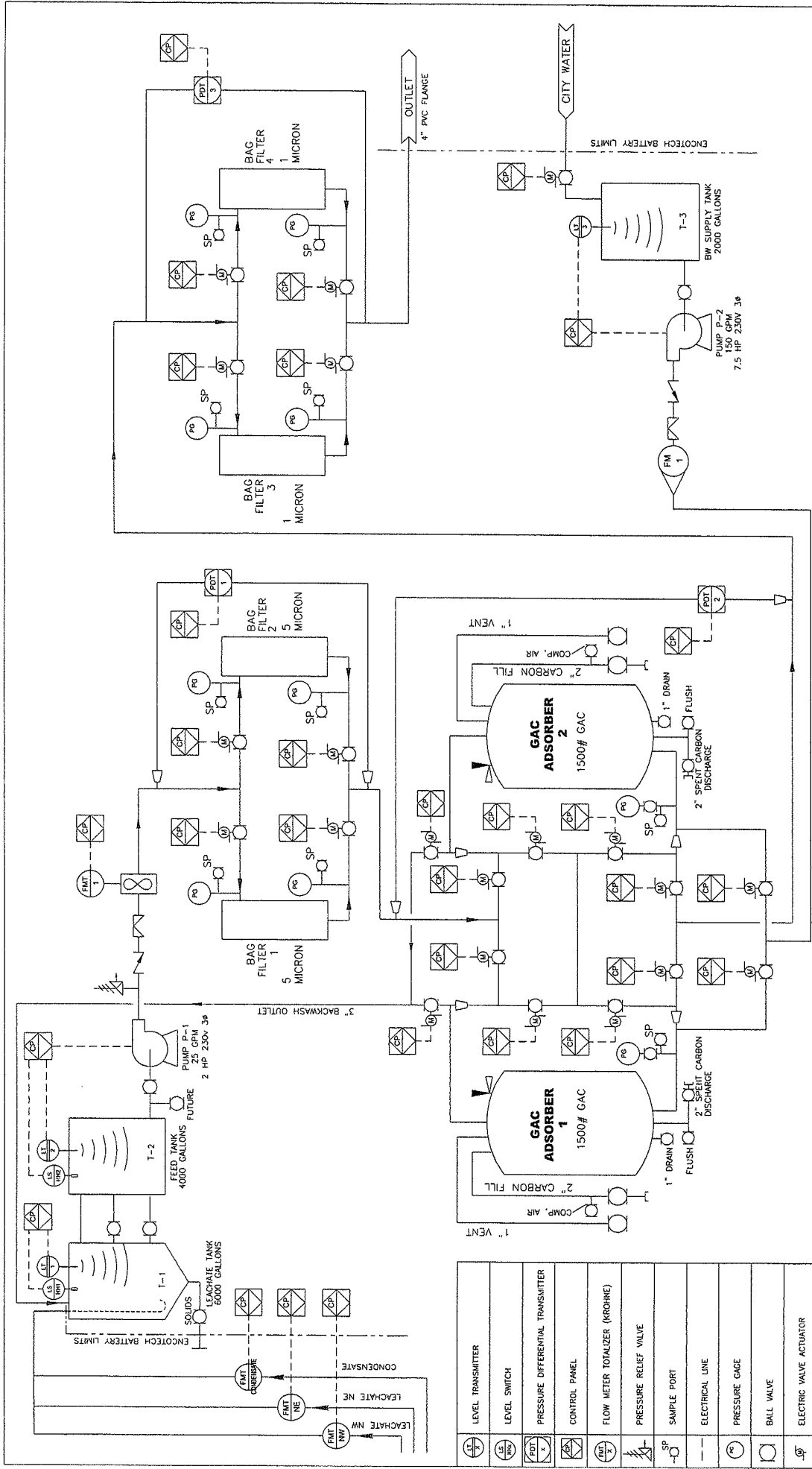




PLAN



DRAWN CBH 2/17/15 CHECKED APPROVED	DATE 2/17/15 RIVERVIEW, MI BUILDING LAYOUT PLAN	ENCOTECH P.O. Box 305, 1037 Rt. 619 Bigby Four, Pa. 15330	
SCALE 1" = 7'	DRAWING NO. 16010-120	SHEET 1 OF 3	REV. 02

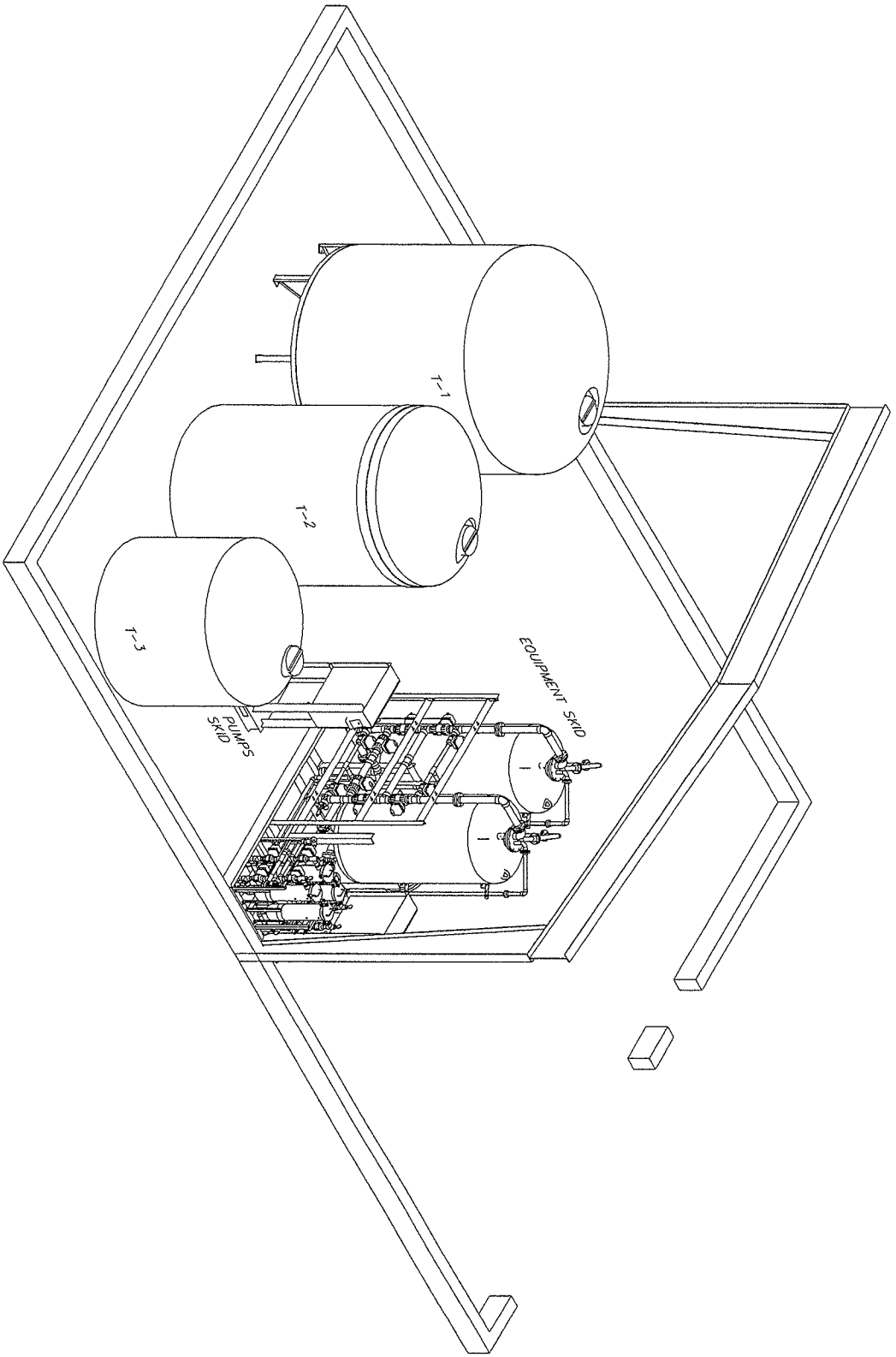


DRAWN	DATE	CUSTOMER	ENCOTECH
1/29/15	1/29/15	JOB	RIVERVIEW LAND PRESERVE
CHECKED		CUSTOMER PO	
APPROVED		FILE NAME	
NONE		SCALE	NONE

SYSTEM	LEACHATE PRETREATMENT
DRAWING NO.	16010-100
SHEET	1 OF 1
REV.	06

- NOTES:
- 1) DESIGN FLOW RATE: 25 GPM
 - 2) ALL PIPING: 1" SCH 80 PVC UNLESS NOTED OTHERWISE
 - 3) VALVE ACTUATORS: 120 VAC
 - 4) PUMPS: 230V 3Ø

LT	LEVEL TRANSMITTER
LS	LEVEL SWITCH
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
CP	CONTROL PANEL
FMT	FLOW METER TOTALIZER (KROHNE)
SP	PRESSURE RELIEF VALVE
SP	SAMPLE PORT
EL	ELECTRICAL LINE
PG	PRESSURE GAUGE
BV	BALL VALVE
EV	ELECTRIC VALVE ACTUATOR
CV	CHECK VALVE
VFM	VARIABLE AREA FLOW METER (VINE)
FCV	FLOW CONTROL VALVE
VB	VACUUM BREAKER



NORTHWEST ISOMETRIC

DRAWN	DATE	ENCOTECH
CBH	2/17/15	
CHECKED		1037 Rt. 519 P.O. Box 305 Eighty Four, PA 15330 724-222-3334
APPROVED		RIVERVIEW, MI
BUILDING LAYOUT		
ISOMETRIC		
DRAWING NO.	SHEET	REV.
16010-120	3 OF 3	00
SCALE		
1" = 7'		



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING



LIESL EICHLER CLARK
DIRECTOR

May 7, 2020

Mr. Jeffrey Dobek, Assistant City Manager
City of Riverview
14100 Civic Park Drive
Riverview, Michigan 48193

Dear Mr. Dobek:

SUBJECT: Application for Solid Waste Disposal Area Operating License; City of Riverview; Riverview Land Preserve; Waste Data System Number 399054; License Number 9600

Staff of the Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division (MMD), has reviewed your application for a municipal solid waste landfill, known as Riverview Land Preserve, located in the city of Riverview, Wayne County, Michigan. This review was conducted under the provisions of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

Based upon our review of your application, your operating license is hereby granted. Enclosed is your license with operating stipulations.

Should you require further information, please contact Mr. Greg Morrow, Warren District Assistant Supervisor, MMD, at 586-753-3852; MorrowG@michigan.gov; or EGLE, 27700 Donald Court, Warren, Michigan 48092.

Sincerely,

Rhonda S. Oyer, Manager
Solid Waste Section
Materials Management Division
517-897-1395

Enclosure

cc: Wayne County Department of Public Services
City of Riverview Clerk
Mr. Gregg Morrow, EGLE-Warren
Facility File



Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division

SOLID WASTE DISPOSAL AREA OPERATING LICENSE

Effective April 22, 2019, the Michigan Department of Environmental Quality, by Executive Order Number 2019-06, became the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Effective April 22, 2019, the Waste Management and Radiological Protection Division became the Materials Management Division (MMD).

This license is issued under the provisions of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.11501 et seq., and authorizes the operation of this solid waste disposal area (Facility) in the state of Michigan. This license does not obviate the need to obtain other authorizations as may be required by state law.

FACILITY NAME: Riverview Land Preserve

LICENSEE/OPERATOR: City of Riverview

FACILITY OWNER: City of Riverview

PROPERTY OWNER: City of Riverview

FACILITY TYPE(S): Municipal Solid Waste Landfill

FACILITY ID NUMBER: 399054

COUNTY: Wayne

LICENSE NUMBER: 9600

ISSUE DATE: May 7, 2020

EXPIRATION DATE: May 7, 2025

FACILITY DESCRIPTION: The Riverview Land Preserve, a municipal solid waste landfill, consists of 403.11 acres located at 20863 Grange Road, City of Riverview, Wayne County, Michigan, as identified in Attachment A and fully described in this license.

AREA AUTHORIZED FOR DISPOSAL OF SOLID WASTE: As described in Attachment A and Item 2 of this license.

RESPONSIBLE PARTY: Mr. Jeffrey Dobek, Assistant City Manager
City of Riverview
14100 Civic Park Drive
Riverview, Michigan
734-281-4263

RENEWAL OPERATING LICENSE: This License Number 9600 supersedes and replaces Solid Waste Disposal Area Operating License Number 9463 issued to City of Riverview on January 15, 2016.

This license is subject to revocation by the Director of the Michigan Department of Environment, Great Lakes, and Energy, if the Director finds that this Facility is not being constructed or operated in accordance with the approved plans, the conditions of a permit or license, Part 115, or the rules promulgated under Part 115. Failure to comply with the terms and provisions of this license may result in legal action leading to civil and/or criminal penalties pursuant to Part 115. This license shall be available through the licensee during its term and remains the property of the Director.

THIS LICENSE IS NOT TRANSFERABLE.

Rhonda S. Oyer, Manager, Solid Waste Section
Materials Management Division

Licensee: City of Riverview
Facility Name: Riverview Land Preserve
Operating License Number: 9600
Issue Date: May 7, 2020

The licensee shall comply with all terms of this license and the provisions of Part 115 and the administrative rules implementing Part 115 (Part 115 Rules). This license includes the license application and any attachments to this license.

1. The licensee shall operate the Facility in a manner that will prevent violations of any state or federal law.
2. The following portions of the Facility are authorized to receive solid waste by this license:

ACTIVE PORTIONS NOT AT FINAL GRADE: The area(s) identified as Cell 1 (4.94 acres), Cell 2 (11.49 acres), Cell 3 (14.12 acres), Cell 4 (10.74 acres), Cell 4 Slope Cap (3.63 acres), Cell 4 Slope Cap Extension (3.97 acres), Cell 5 (10.47 acres), Cell 5 Slope Cap (6.15 acres), Cell 6 (12.37 acres), Cell 6 Slope Cap (3.50 acres), Cell A North (7.28 acres), part of Cell 7 Overfill (48.81 acres), and "Interim Cover Area without Future Vertical Expansion" (4.39 acres) were authorized to receive waste by the previous license. This area's total acreage is 141.86 acres.

3. The following portions of the Facility **WILL BE** authorized to receive solid waste by this license following approval by EGLE of construction certification:

UNCONSTRUCTED AREA(S) WITH FINANCIAL ASSURANCE: The area(s) identified as part of Cell 7 overfill overlying portions of Cell A, totaling 9.0 acres, are included in the calculation of financial assurance as required by Section 11523 of Part 115. This portion(s) of the Facility shall be authorized to receive waste, as part of this license, when acceptable certification is submitted to EGLE, as required by Section 11516(5) of Part 115, and determined by EGLE to be consistent with Part 115 and the Part 115 Rules. The certification shall verify that construction of this area(s) was in accordance with the Construction Permit(s) listed in Item 8 of this license, Part 115, and the Part 115 Rules.

4. The following portions of the Facility are **NOT** authorized to receive solid waste by this license:

CLOSED UNIT(S) OR A PORTION OF A UNIT WHERE THE FINAL COVER HAS BEEN CERTIFIED CLOSED AND ACCEPTED BY EGLE: The following unit(s) and/or portion(s) are closed:

EXISTING UNIT(S): The unit(s) or portion(s) of unit(s) identified as The portions of the unit identified as Closed North Area (51.5 acres - originally 67.99 acres, but reduced by 16.49 acres now included in Cell 7 overfill area) and 2001 North Slope Closure (8.92 acres) had final closure certified on December 15, 1992, and February 12, 2002, respectively. This certification was reviewed and approved by EGLE on April 8, 1993, and February 23, 2005, respectively. This area's total acreage is 60.42 acres.

5. The attached map (Attachment A) shows the Facility, the area permitted for construction, monitoring points, leachate storage units, site roads, other disposal areas, and related appurtenances.
6. Issuance of this license is conditioned on the accuracy of the information submitted by the Applicant in the Application for License to Operate a Solid Waste Disposal Area (Application) received by EGLE on January 15, 2020, and any subsequent amendments. Any material or intentional inaccuracies found in that information is grounds for the revocation or modification of this license and may be grounds for enforcement action. The licensee shall inform EGLE's MMD Warren District Supervisor, of any inaccuracies in the information in the Application upon discovery.
7. This license is issued based on EGLE's review of the Application, submitted by City of Riverview, for the Riverview Land Preserve, dated January 15, 2020, and revised on February 20, 2020. The Application consists of the following:
 - a. Application Form EQP 5507.
 - b. Application fee in the amount of \$10,000.00.
 - c. Certification of construction by NA, dated NA.
 - d. Waste Characterization: N/A.

e. Restrictive Covenant:

The Riverview Land Preserve restrictive covenant on 289.888 acres is on file at the Wayne County Register of Deeds recorded on May 24, 2012, as Liber 49853 pages 1336. A copy is on file with EGLE.

f. Perpetual Care Fund Agreement, established as an escrow account, signed by Mr. Robert Elliot, City Manager, City of Riverview on January 27, 1997, was executed by EGLE on March 10, 1997.

g. Financial Assurance.

i. Financial Assurance Required:

The amount of financial assurance required for this Facility was calculated based on the calculation worksheet form EQP 5507A entitled, "Form A, Financial Assurance Required," and is \$17,698,810.32.

The Facility has provided financial assurance totaling \$17,801,972.80, based on the requirements of Section 11523 of Part 115, consisting of a combination of the Perpetual Care Fund established under Section 11525 of Part 115, bonds, and the financial capability of the Applicant as evidenced by a financial test. The financial assurance mechanisms used by the Facility are summarized below in Items ii, iii, and iv, respectively.

ii. Financial Assurance Provided Via a Perpetual Care Fund:

The Perpetual Care Fund Agreement statement showed a balance of \$4,047,836.75 in the Facility's Perpetual Care Fund as of December 31, 2019. Of this amount, EGLE has granted the request to use \$4,047,836.75 toward the total amount of financial assurance required.

iii. Financial Assurance Provided Via Bond:

The following financial assurance has been received from the Applicant to meet the amount of financial assurance required:

Escrow Account	\$13,754,136.05
Total Amount Received:	\$13,754,136.05

iv. Financial Assurance Provided Via a Financial Test for a Type II Landfill: N/A:

v. Financial Assurance Updates Required:

For Type II landfills, the financial assurance cost estimates of closure and postclosure activities must be updated annually and the corresponding requisite amount of financial assurance must be adjusted annually for the costs of inflation. The corresponding financial assurance, as adjusted for inflation and other factors, is due one year from the date of this license, and each year thereafter.

vi. Other Required Financial Assurance: N/A.

8. The following documents approved with Construction Permit Numbers 0216, 0365, and 4060 issued to the City of Riverview for the Riverview Land Preserve on March 28, 1990, September 30, 1998, and April 8, 2004, respectively, are incorporated in this license by reference:

a. Environmental Assessment received by the EGLE on March 8, 1989.

b. Engineering Report prepared by Hennessey Engineers Incorporated dated January 1990 and revised in March 1990.

Licensee: City of Riverview
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- c. Engineering plan set (30 sheets) titled "Riverview Land Preserve Proposed Expansion," prepared by Hennessey Engineers Incorporated, dated 1990.
 - d. Engineering report titled "Stormwater Drainage Plan, Riverview Land Preserve," Riverview, Michigan, dated May 1998 prepared by EMCON.
 - e. Engineering plans, sheets 1-13 titled "Permit Modification Plans for Riverview Land Preserve, Final Grading, and Stormwater Management Plan," prepared by EMCON and dated May 1998, and revised September 21, 1998, March 28, 2001, and June 14, 2001.
 - f. "Application for Vertical Expansion," Riverview Land Preserve, prepared by Shaw EMCON/OWT, Inc., dated December 12, 2003, and revised on March 30, 2004.
 - g. Engineering plans titled "Riverview Land Preserve Vertical Expansion," prepared by Shaw EMCON/OWT, Inc., dated December 2003, and revised on March 5, 2004, March 18, 2004, and March 26, 2004.
9. The following additional documents, approved since the issuance of the construction permit(s) referenced in Item 8, are incorporated in this license by reference:
- a. Work Plan for groundwater monitoring report prepared by Hennessey Engineers, Inc., dated February 6, 1991.
 - b. Monitor Well Installation/Hydrogeological report, prepared by Hennessey Engineers, Inc., dated August 1992.
 - c. Engineering Plans for Cell II of Phase I and Cell III of the Phase II Design and Construction Quality Assurance Plans, dated 1992 and 1993, respectively.
 - d. Hydrogeological Report Addendum, prepared by Hennessey Engineers, Inc., dated July 1993.
 - e. Closure report for the "Closed North Area," approved April 8, 1993.
 - f. Monitoring Wells, Abandonment Work Plan, dated May 1994.
 - g. Hydrogeological Monitoring Plan submitted October 1995, and revised November 1997, April 1998, July 2000, September 2000, and February 2007.
 - h. Groundwater Monitoring Parameter Waiver Request, prepared by EMCON, dated December 1997.
 - i. Monitoring Well Repair and Well Abandonment Summary Report, prepared by EMCON, dated May 1997.
 - j. Work Plan for Monitoring Well Replacement and Abandonment, prepared by EMCON, dated March 13, 1998.
 - k. Engineering report titled "Final Cap Design Changes," dated April 2, 2001, and revised June 14, 2001.
 - l. Engineering report titled "Construction Documentation Report, 2001 North Slope Closure," prepared by EMCON/OWT, Inc., dated November 2001.
 - m. Engineering plans titled "City of Riverview, Riverview Land Preserve, Cell 4 Construction Plans" (6 sheets), dated February 2002.
 - n. A letter with the subject "Construction Upgrade Cell 4 Riverview Land Preserve" dated June 5, 2002.
 - o. Engineering report titled "Construction Documentation Report Cell 4 Construction," dated October 2002.
 - p. Leachate Storage Tank Improvement Documentation dated December 16 and 17, 2002, and approved by EGLE on February 24, 2003.

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- q. Engineering report titled "Construction Documentation Report, Cell 4 Slope Cap Extension Construction," dated December 2004.
- r. The engineering document titled "Landfill Gas Collection and Control System Design Plan," dated July 2004 including Drawings numbered 1 through 6 of the Engineering Plan Set titled "Plans for Gas Collection and Control System Design," dated June 2004, with revisions to Drawing No. 3, dated February 2, 2006, and Drawing Number 7 titled "Isopach for Remaining Permitted Airspace," dated October 26, 2004, and received by the EGLE on February 13, 2006.
- s. Section 9.0, "Leachate Recirculation" of the Comprehensive Operating Plan, dated May 24, 2005, received by the EGLE on June 9, 2005.
- t. Drawings numbered 1 through 6 of the Engineering Plan Set titled "Leachate System Upgrades," dated October 2005 and received by the EGLE on February 2, 2006.
- u. Drawing No. 2 titled "Cell 5 Construction Project, Cell 5 Soil Boring Locations," dated May 18, 2006, and received by the EGLE via e-mail on June 14, 2006.
- v. Engineering drawing titled "Addendum 1, City of Riverview, Riverview Land Preserve, Wayne County, Michigan, Cell 5 Construction Project, In-Line Flow Meter Detail," dated June 12, 2006, and received by the EGLE via e-mail on June 14, 2006.
- w. Engineering document titled "Cell 5 Construction Documentation Report," prepared by Cornerstone Environmental Group, LLC, dated February 2007 and revised June 18, 2007.
- x. Certification document titled "Cell 5 Geomembrane Liner Repair Report" prepared by Cornerstone Environmental Group, LLC, dated August 10, 2007, and revised on September 10, 2007, via an electronic mail submittal.
- y. Procedural document titled "Riverview Land Preserve, Special Waste Management Program," dated August 2007, and submitted with a transmittal letter dated August 23, 2007.
- z. Engineering plan set (consisting of a title sheet and sheets numbered 1 through 6) titled "Plans for the 2008 Leachate System Upgrades at City of Riverview, Riverview Land Preserve, Wayne County Michigan," dated October 2008, and submitted with a transmittal letter dated November 7, 2008, and received by the EGLE on November 12, 2008.
- aa. Engineering document titled "Cell 6 Construction Documentation Report" prepared by Cornerstone Environmental Group, LLC, dated November 2010, and revised February 2011.
- bb. A revised "Alternate Daily Cover Operations Plan," prepared by Cornerstone Environmental Group, LLC, dated February 2011, and revised February 25, 2011. This plan revises the previously approved "Alternate Daily Cover Materials Operations Plan" dated August 2000.
- cc. Letter request from the City of Riverview (with 3 supporting attachments) dated June 15, 2011, and supplemented July 12, 2011, requesting approval to construct/operate a 100 yard, Riverview Police Department Firing range on the 113 acre soil borrow area adjacent to the landfill.
- dd. Letter report titled "Riverview Land Preserve – Sand Protective/Drainage Layer – Cell 6, Erosion Corrective Measures" prepared by Cornerstone Environmental Group, LLC, dated March 6, 2012.
- ee. Letter report titled "Riverview Land Preserve – Sand Protective/Drainage Layer – Cell 6; Erosion Corrective Measures" prepared by Cornerstone Environmental Group, LLC, dated April 6, 2012, and received by the EGLE on April 9, 2012.

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- ff. Engineering plan set titled "Plans for the CNG Fueling Station at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Cornerstone Environmental Group, LLC, dated November 2012 and submitted with an explanatory transmittal letter dated November 28, 2012, and a revised operational document titled H2S Media Change Out Procedure, submitted via electronic mail by Cornerstone Environmental Group, LLC on January 3, 2013.
- gg. Engineering plan set (drawings numbered 1 through 4) titled "Bid Plans for the 2014 GCCS Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan," prepared by Cornerstone Environmental Group, LLC, dated June 2014 and received by the EGLE on June 16, 2014, via electronic mail submittal.
- hh. Engineering plan set titled "Construction Plans for the Leachate Pretreatment System Pre-Engineered Metal Building and Process Systems at City of Riverview, Riverview Land Preserve, Wayne County, Michigan," prepared by Cornerstone Environmental Group, LLC, dated December 2014 and revised March 2015.
- ii. Letter report (with 8 attachments) titled "Riverview Land Preserve, Final Cover Geomembrane Repairs," prepared by Cornerstone Environmental Group, LLC, dated March 10, 2015.
- jj. Engineering plan set (Drawings numbered 1 through 7) titled "Plans for the 2015 GCCS Construction & North Slope Repair at City of Riverview, Riverview Land Preserve, Wayne County, Michigan," prepared by Cornerstone Environmental Group, LLC, dated March 2015 and received by the MMD via e-mail on April 10, 2015.
- kk. Letter report (including Attachments A through E) titled "Riverview Land Preserve, Horizontal Collection Trench and Final Cover Repairs," prepared by Cornerstone Environmental Group, LLC, dated November 2, 2015.
- ll. Revised engineering drawings numbered 3B, 4, 8A, and 9L from the previously approved Construction Permit plan set titled "Riverview Land Preserve Vertical Expansion" (dated December 2013 and revised March 2004), prepared by Cornerstone Environmental Group, LLC, dated March 17, 2016, and received by the EGLE via electronic mail submittal on March 29, 2016.
- mm. A revised version of the document titled "Construction Quality Assurance Plan, Riverview Land Preserve, City of Riverview, Wayne County, Michigan", prepared by Cornerstone Environmental Group, LLC, dated June 2016 and received by the EGLE via e-mail on June 9, 2016.
- nn. Engineering plan set (drawings numbered 1 through 9) titled "Plans for the 2016 GCCS Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Cornerstone Environmental Group, LLC, dated March 2016 and received by the EGLE on June 16, 2016, via electronic mail submittal.
- oo. Engineering drawings (numbered 1 and 2) titled "Southeast Pump Station Outlet Re-Route, Site Plan and Leachate Details", prepared by Cornerstone Environmental Group, LLC, dated November 4, 2016, and received by the EGLE on November 21, 2016, via electronic mail submittal.
- pp. Revised pipe capacity calculations for the Cell 7-North leachate discharge pipes based on new proposed liner/pipe grades and revised drainage areas, prepared by Cornerstone, dated August 5, 2016, and received by the EGLE in a submittal dated November 9, 2016.
- qq. Updated slope stability evaluation for Cell 7-North to re-evaluate slope stability based on new proposed liner grades/berm height and actual soil and material properties for the project area, prepared by Cornerstone, and received by the EGLE in a submittal dated November 9, 2016.
- rr. Revised flow capacity calculations for the Cell 7 geocomposite drainage material, prepared by Cornerstone, dated October 18, 2016, received by the EGLE in a submittal dated November 9, 2016, and supplemented in an e-mail from Cornerstone dated January 6, 2017.
- ss. Revised engineering drawings numbered 3B, 4, 8A, 8B, 8C, 9D, 9E, 9F, 9K and 9L from the previously approved Construction Permit plan set titled "Riverview Land Preserve Vertical Expansion" (dated December 2003 and

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revised March 2004), prepared by Cornerstone Environmental Group, LLC (Cornerstone), dated November 4, 2016, and February 6, 2017, and received by the EGLE in submittals dated November 9, 2016, and February 6, 2017.

- tt. New engineering drawing numbered 9E2 for addition to the previously approved Construction Permit plan set titled "Riverview Land Preserve Vertical Expansion" (dated December 2003 and revised March 2004), prepared by Cornerstone, dated February 6, 2017, and received by the EGLE in a submittal dated February 6, 2017.
- uu. Evaluation and data for triaxial shear tests conducted on soils from the constructed Cell 7-North berm, prepared by Cornerstone in a Memorandum dated November 17, 2015, and received by the EGLE in a submittal dated February 6, 2017.
- vv. Engineering report titled "Cell 7 North Construction Documentation Report", prepared by Cornerstone Environmental Group, dated March 2017 and revised on May 5, 2017 in response to MMD staff comments.
- ww. Record drawings (numbered 1 through 15) titled "Record Drawings for Cell 7 North Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Cornerstone Environmental Group, dated March 2017.
- xx. Revised engineering drawings numbered 3BR and 9E2, dated October 3, 2017, which amend the previously approved Construction Permit plan set titled "Riverview Land Preserve Vertical Expansion" (dated December 2003 and revised March 2004), and supplemental drawings numbered I-1, I-2, and I-3 dated August 30, 2017, all of which relate to design changes to the Cell 7 Phase 3 berm and base grades.
- yy. Engineering detail titled "Cell 7 Flowmeter & Valve Vault Proposed Modifications", prepared by Cornerstone Environmental Group, dated November 30, 2017, and received by the EGLE as an attachment to the Response to Violation Notice letter dated November 29, 2017.
- zz. Engineering report titled "Cell 7 Phase 2 Construction Documentation Report", prepared by Cornerstone Environmental Group, dated February 2018 and revised on April 19, 2018, in response to MMD staff comments.
- aaa. Record drawings titled "Record Plan Set for Cell 7 Phase 2 Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Cornerstone Environmental Group, dated February 2018 and revised April 18, 2018, (with respect to Sheet 5P).
- bbb. Engineering plan set (Drawings numbered 1 through 8) titled "Plans for the 2018 Phase 2 GCCS Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Cornerstone Environmental Group, LLC, dated May 2018 and received by the MMD via e-mail on June 11, 2018.
- ccc. Cell 7 Phase 3 "Revised Sump Detail" (identified as Sheet No. 12) prepared by Tetra Tech dated July 23, 2019 and received by the MMD via e-mail on July 24, 2019.
- ddd. Engineering plan set (Drawings numbered 1 through 8) titled "Plans for the 2019 GCCS Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Tetra Tech, dated July 2019 and received by the MMD via e-mail on August 16, 2019.
- eee. Engineering report titled "Cell 7 Phase 3 Construction Report", prepared by Tetra Tech, dated September 6, 2019 and revised on October 17, 2019, and November 7, 2019.
- fff. Record drawings titled "Record Plans for Cell 7 Phase 3 Construction at City of Riverview, Riverview Land Preserve, Wayne County, Michigan", prepared by Tetra Tech, dated September 2019 and revised October 17, 2019 (with respect to Sheets 3C and 9).
- ggg. Engineering plans (5 sheets) submitted on February 6, 2020 for the emergency leachate force main proposed for Cells 4, 5, and 6 at Riverview Land Preserve.

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10. Consent Order/Judgment Number: N/A.
11. The licensee shall repair any portion of the certified liner or leachate collection system that is found to be deficient or damaged during the term of this license unless determined otherwise by EGLE.
12. The licensee shall have repairs to any portion of the certified liner or leachate collection system recertified by a registered professional engineer in accordance with R 299.4921 of the Part 115 Rules and approved by EGLE before receiving waste in that portion of the certified liner or leachate collection system. The licensee shall submit the recertification to EGLE's MMD Warren District Supervisor, for review and approval.
13. The licensee shall conduct hydrogeological monitoring in accordance with the approved hydrogeological monitoring plan, dated October 1995 and revised November 1997, April 1998, July 2000, September 2000, and February 2007. The sampling analytical results shall be submitted to EGLE's MMD Warren District Office.
14. Modifications to the approved hydrogeological monitoring plan referenced in Item 13 may be approved, in writing, by EGLE's MMD Warren District Supervisor. Proposed revisions must be submitted in a format specified by EGLE.
15. Leachate may be recirculated if a leachate recirculation plan has been approved, in writing, by EGLE's MMD Warren District Supervisor.
16. Modifications to approved engineering plans that constitute an upgrading, as defined in R 299.4106a(l) of the Part 115 Rules, may be approved, in writing, by EGLE's MMD Warren District Supervisor.
17. Requests for alternate daily cover may be approved, in writing, by EGLE's MMD Warren District Supervisor.
18. Leakage Control Criteria:

The active portions of the unit(s) authorized to receive waste by this license is a monitorable unit(s) which is located over a natural soil barrier and that is in compliance with the provisions of R 299.4422(2) of the Part 115 Rules.

19. **VARIANCES:** The licensee is granted the following variance(s) from Part 115 and/or the Part 115 Rules: None.
20. **SPECIAL CONDITIONS:**
 - a. The licensee shall place a compacted layer of not less than six inches of earthen material, unless an exemption is granted, of suitable cover material on all exposed solid waste by the end of each working day, as required by R 299.4429(1) of the Part 115 Rules. Suitable cover shall be either uncontaminated soil or an alternate cover approved by the MMD, listed in Item i, below. Alternate cover shall be restricted as indicated in Item ii and applied as per the approved operational plan submitted by the licensee.

- i. Approved alternate cover shall be any of the following:

<u>Product/Waste Material</u>	<u>Source</u>	<u>Monthly Volume</u>
(1) Classes A and B Alternate Daily Cover Materials as specified in the approved Alternate Daily Cover Materials Operations Plan dated August 2000 and revised February 2011	Various	Varies
(2) Contaminated Soils	I-94 and Mt. Elliot Site Detroit, MI (construction site)	N/A (single receipt of ~ 100,000 tons)

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(3) Contaminated Soils	Brush-Watson Development Detroit, MI (construction site)	N/A (single receipt of ~60,000 cy)
(4) Contaminated Soils	3 locations Detroit, MI (construction sites)	N/A (single receipt of ~12,000 cy)
(5) Contaminated Soils	Meijer Out lot West Rd. and Allen Rd. Woodhaven, MI	N/A (single receipt of ~40,000 cy)
(6) Contaminated Soils	Construction Site Northline Rd. and Telegraph Rd. Taylor, MI	N/A (single receipt of ~25,000 cy)

ii. The above materials are approved for daily cover when used in the following manner:

- (1) The licensee shall use the material as daily cover only. The material cannot be used for road building or fill in other areas of the Facility's operation.
- (2) The licensee shall maintain copies of the testing performed on Class B and Class C materials in the facility operating record.
- (3) The licensee shall only stockpile material in a secure manner within the active cell.
- (4) This approval does not preclude the licensee from disposing of the material as waste in the active fill area instead of using the material as daily cover.
- (5) This approval shall immediately become void upon documentation by EGLE that the alternative cover is not being used in accordance with listed conditions, that the alternative cover is not providing the necessary protection, that the material no longer meets the alternative daily cover guidelines, or that the process producing the waste material has changed.
- (6) If the material does not meet the guidelines from Attachment 2 of Policy and Procedure OWMRP-115-10, for nonvolatiles, the licensee shall ensure that fugitive dust emissions from this material do not occur. Acceptable methods to ensure fugitive emissions do not occur are:
 - (a) Implement a schedule to wet down material; or
 - (b) Cover the material with a tarp; or
 - (c) Apply an approved foam or other appropriate commercial dust control product.
- (7) This approval to use alternative cover shall expire upon expiration of this operating license.



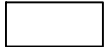

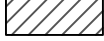
b. The Facility may recirculate leachate in accordance with Section 9.0, Leachate Recirculation of the Comprehensive Operating Plan, dated May 24, 2005, received by the EGLE on June 9, 2005.

21. **TERM:** This license shall remain in effect until its expiration date, unless revoked or continued in effect, as provided by, the Administrative Procedures Act, 1969 PA 306, as amended, or unless superseded by the issuance of a subsequent license.





END OF LICENSE

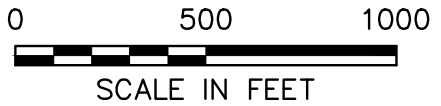
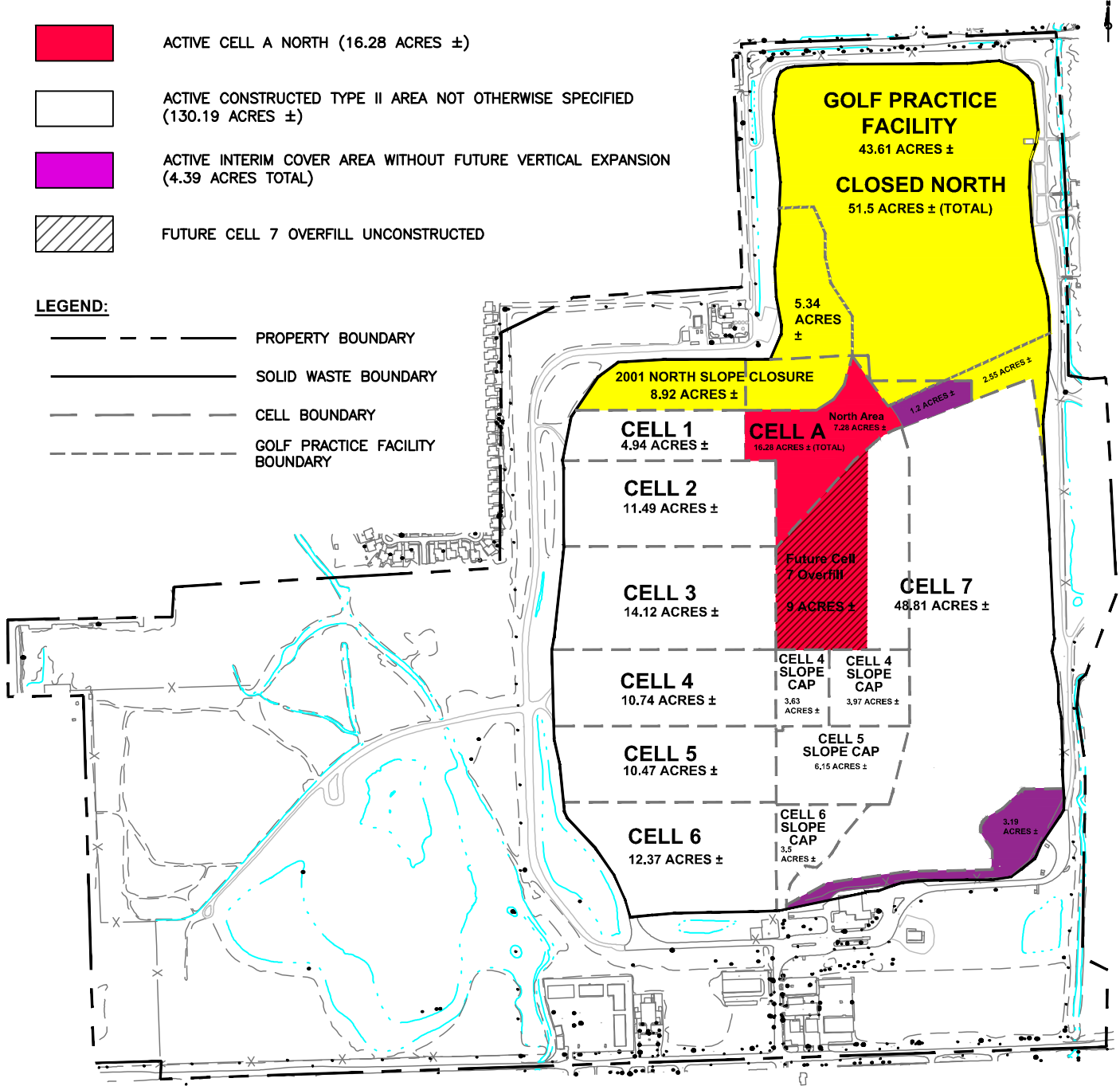
ATTACHMENT A

KEY:

-  PARTIALLY CLOSED TYPE II AREA (60.42 ACRES ±)
-  ACTIVE CELL A NORTH (16.28 ACRES ±)
-  ACTIVE CONSTRUCTED TYPE II AREA NOT OTHERWISE SPECIFIED (130.19 ACRES ±)
-  ACTIVE INTERIM COVER AREA WITHOUT FUTURE VERTICAL EXPANSION (4.39 ACRES TOTAL)
-  FUTURE CELL 7 OVERFILL UNCONSTRUCTED

LEGEND:

-  PROPERTY BOUNDARY
-  SOLID WASTE BOUNDARY
-  CELL BOUNDARY
-  GOLF PRACTICE FACILITY BOUNDARY



This drawing represents intellectual property of Tetra Tech. Any modification to the original by other than Tetra Tech personnel violates its original purpose and as such is rendered void. Tetra Tech will not be held liable for any changes made to this document without express written consent of the originator.

File: Y:\PROJECTS\RIVERVIEW\190488 - FY 2019-2020\Task 1 - General Site Support\License Application\190488-X SITE PLAN.dwg Layout: Layout1-SHEET X User: adam.marshall1 Feb 25, 2020 - 9:49am



RIVERVIEW LAND PRESERVE
WAYNE COUNTY, MICHIGAN
FACILITY ACREAGE MAP

FIGURE NO.
1
PROJECT NO.
190488.01

ALL PROFESSIONAL ENGINEERING WORK IS PERFORMED BY DULY LICENSED PROFESSIONAL ENGINEERS UNDER THE APPROPRIATE STATE REGISTERED PROFESSIONAL ENTITY.



TETRA TECH

September 16, 2021

Kurian Joychan
Industrial Pretreatment Program Manager
797 Central Avenue
Wyandotte, Michigan 48192

Re: Request for Time proportional sampling or grab sampling
Wastewater Discharge Permit Number D-10804
Riverview Land Preserve, Riverview Michigan

Project Number 4211498.008

Dear Mr. Joychan:

On behalf of the City of Riverview and the Riverview Land Preserve (RLP), Cornerstone Environmental Group, LLC, a wholly owned subsidiary of Tetra Tech (Tetra Tech) is requesting approval to continue collection of discharge samples using the grab sampling technique at the Riverview Land Preserve.

The RLP has been discharging to the DUWA system for many years. Samples have been collected using 24-hour composite collection as well as grab sampling with approval from DUWA. We have an extensive number of sample results in our database going back to 2006. While there is some variability from quarter to quarter (due to rainfall and waste content) the large body of results that we have collected shows that overall, the leachate characteristics at RLP have been consistent over a long period of time, and irrespective of sampling method. Landfill leachate is generated and collected continuously and is not likely subject to wide swings in results on an hour-to-hour basis. We believe that the continuation of grab sampling at RLP is appropriate for this wastewater stream and request your concurrence and approval to continue in this manner

If you have any questions regarding this request please contact the undersigned at (734) 306-4365.

Sincerely,

CORNERSTONE ENVIRONMENTAL GROUP, LLC – A TETRA TECH COMPANY

Eric Anderson
Project Manager

Jennifer Bowyer
Senior Project Manager

Received 9/16/2021 KJ
Approved 9/16/2021
16J

cc: Site File – Riverview Land Preserve
Jeffery Dobek – City of Riverview (Electronically)
Randall Pentiuk – City of Riverview Counsel (Electronically)

TETRA TECH
39395 W. Twelve Mile Road, Suite 103, Farmington Hills, MI 48331
Tel 877.633.5520 Fax 877.845.1456 tetrattech.com

APPENDIX C (APPENDIX A OF SUO)
DOWNRIVER UTILITY WASTEWATER AUTHORITY
LOCAL DISCHARGE LIMITATIONS
JANUARY 2020

No	Parameter	Limit (Average Daily Concentrations)	Units
1	Arsenic, Total	1.55	mg/l
2	Cadmium, Total	0.45	mg/l
3	Chromium, Total	10.0	mg/l
4	Copper, Total	1.55	mg/l
5	Cyanide, Total	1.0	mg/l
6	Lead, Total	1.0	mg/l
7	Mercury, Total	<0.0002	mg/l
8	Nickel, Total	6.0	mg/l
9	Silver, Total	0.25	mg/l
10	Zinc, Total	4.5	mg/l
11	Fats, Oil, and Grease (FOG)	500.0	mg/l
12	Phenolics, Total	1.0	mg/l
13	Polychlorinated Biphenyls (PCBs)	<0.0002	mg/l
14	pH	5.0 - 11.5	S.U.
15	Carbonaceous Biochemical Oxygen Demand (CBOD5)	2,200	mg/l
16	Total Phosphorus	53.4	mg/l
17	Total Suspended Solids (TSS)	2,600	mg/l
18	Chloroform	0.25	mg/l
19	Methylene Chloride	1.0	mg/l
20	Tetrachloroethylene	0.25	mg/l
21	Toluene	1.0	mg/l
22	Trichloroethylene	0.50	mg/l
23	BTEX (Benzene, Toluene, Ethylbenzene, Xylene)	2.0	mg/l

Quantification levels shall not exceed 0.2ug/l for Mercury and PCBs. This paragraph does not authorize the discharge of Mercury or PCBs at levels which are injurious to the designed uses of the waters of the state or which constitute a threat to the public health or welfare. The limits may change if State of Michigan EGLE or EPA requires Control Authority to implement a lower limit.



March 23, 2021

Jeff Dobek
Riverview Land Preserve
14100 Civic Park
Riverview, MI 48192

Dear Mr. Dobek:

Violation Date: 03/10/2021
Violation Description: Phenolics TRC Daily Limit was exceeded. The Result was 2.35 mg/L while the Daily Limit was 1 mg/L. The Violation occurred for Sample '004' on the Sample Date of '3/10/2021' and for Monitoring Point '003B'.

Enforcement Type: **LOV Letter of Violation**
Compliance Due Date: Within 10 days from the receipt of this LOV.
Violation Resolution: 1) This violates the requirements of your class D Wastewater discharge permit and / or provisions of the Downriver Utilities Water Authority Sewer Use Ordinance (DUWASUO), adopted by the DUWA Board Members.

Please provide a written explanation of the violation(s) and a plan for satisfactory correction and prevention of the cause of the violation(s) within 10 days from the receipt of this LOV. Conduct additional sampling for this parameter and submit results within 30 days to show the plant is in compliance with the issued permit. This sampling is in addition to the regular sampling required in the permit.

Failure to comply shall be deemed as a violation of the SUO: and subject to further enforcement action.

DUWA will continue to monitor and sample the wastewater from your facility in accordance with the Industrial Pretreatment Program. Further enforcement measures will be taken against your facility if necessary.

Sincerely,

K Joychan
Mr. Kurian Joychan
IPP & Environmental Compliance Manager

City of Riverview: Mr. Jeff Webb
File-2

Veolia North America
Industrial Pretreatment Program
Compliance Results Report - by Parameter

Permit: **10804**
 Permittee: **Riverview Land Preserve**
 Location: **14100 Civic Park, Riverview, MI 48193**

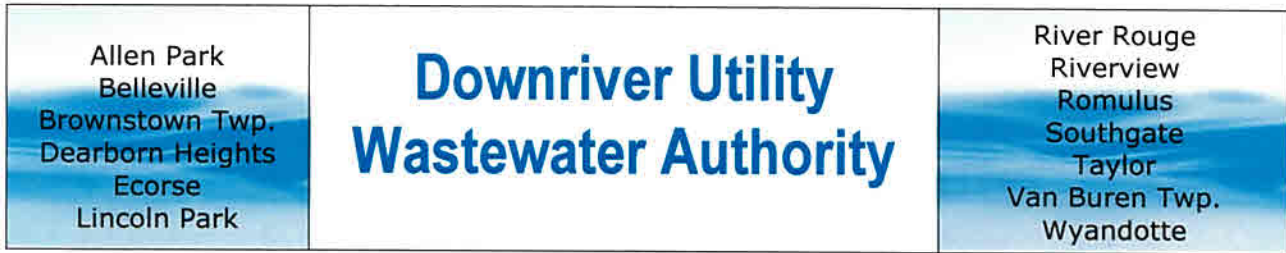
Phenolics

Sample ID	Auth?	MonPoint	Collection Method	Collection Date	Units	CONCENTRATION				MASS	
						Result	Adjusted Result	Violations	Limit	Result (lbs/day)	Limit
004		003B	C/G	09-22-2020	mg/L	<0.10	0		1		
004		003B	C/G	11-12-2020	mg/L	2.2	2.2	D T	1		
004		003B	C/G	11-12-2020	mg/L	2.2	2.2	D T	1		
002	A	003B	C/G	12-15-2020	mg/L	1.53	1.53	D T	1		
004		003B	C/G	12-22-2020	mg/L	<0.20	0		1		
004		003B	C/G	12-22-2020	mg/L	<0.20	0		1		
004		003B	C/G	12-29-2020	mg/L	<1.0	0		1		
003		003B	C/G	01-05-2021	mg/L	0.25	0.25		1		
004		003B	C/G	02-18-2021	mg/L	<1.0	0		1		
002	A	003B	C/G	02-25-2021	mg/L	0.34	0.34		1		
004		003B	C/G	03-04-2021	mg/L	2.64	2.64	D T	1		
004		003B	C/G	03-10-2021	mg/L	2.35	2.35	D T	1		

Total Concentration Results: 12 Avg: .9592 Min: .0000 Max: 2.6400
 Total Mass Results: 0 Avg: Min: Max:

Report Criteria:
 Monitoring Point(s):
 003B

Parameter(s):
 Phenolics



August 8, 2022

Jeffrey Dobek
Riverview Land Preserve
14100 Civic Park
Riverview, MI 48192

Dear Mr. Dobek:

Violation Date: 07/19/2022
Violation Description: Phenolics TRC Daily Limit was exceeded. The Result was 2.28 mg/L while the Daily Limit was 1 mg/L. The Violation occurred for Sample '002' on the Sample Date of '7/19/2022' and for Monitoring Point '004'.

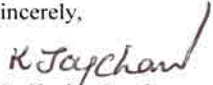
Enforcement Type: **LOV Letter of Violation**
Compliance Due Date: Within 10 days from the receipt of this LOV.
Violation Resolution: 1) This violates the requirements of your class D Wastewater discharge permit and / or provisions of the Downriver Utilities Water Authority Sewer Use Ordinance (DUWASUO), adopted by the DUWA Board Members.

Please provide a written explanation of the violation(s) and a plan for satisfactory correction and prevention of the cause of the violation(s) within 10 days from the receipt of this LOV. Conduct additional sampling for this parameter and submit results within 30 days to show the plant is in compliance with the issued permit. This sampling is in addition to the regular sampling required in the permit.

Failure to comply shall be deemed as a violation of the SUO: and subject to further enforcement action.

DUWA will continue to monitor and sample the wastewater from your facility in accordance with the Industrial Pretreatment Program. Further enforcement measures will be taken against your facility if necessary.

Sincerely,


Mr. Kurian Joychan
Department Manager IPP

City of Riverview: Mr. Jeff Webb
File-2

Veolia North America
797 Central Ave., Wyandotte, MI 48192
TEL #: 734.285.5500

www.veolianorthamerica.com



August 8, 2022

Jeffrey Dobek
Riverview Land Preserve
14100 Civic Park
Riverview, MI 48192

Dear Mr. Dobek:

Violation Date: 07/19/2022
Violation Description: Phenolics TRC Daily Limit was exceeded. The Result was 1.66 mg/L while the Daily Limit was 1 mg/L. The Violation occurred for Sample '002' on the Sample Date of '7/19/2022' and for Monitoring Point '003B'.

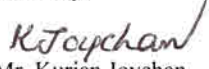
Enforcement Type: **LOV Letter of Violation**
Compliance Due Date: Within 10 days from the receipt of this LOV.
Violation Resolution: 1) This violates the requirements of your class D Wastewater discharge permit and / or provisions of the Downriver Utilities Water Authority Sewer Use Ordinance (DUWASUO), adopted by the DUWA Board Members.

Please provide a written explanation of the violation(s) and a plan for satisfactory correction and prevention of the cause of the violation(s) within 10 days from the receipt of this LOV. Conduct additional sampling for this parameter and submit results within 30 days to show the plant is in compliance with the issued permit. This sampling is in addition to the regular sampling required in the permit.

Failure to comply shall be deemed as a violation of the SUO: and subject to further enforcement action.

DUWA will continue to monitor and sample the wastewater from your facility in accordance with the Industrial Pretreatment Program. Further enforcement measures will be taken against your facility if necessary.

Sincerely,


Mr. Kurian Joychan
Department Manager IPP

City of Riverview: Mr. Jeff Webb
File-2

Veolia North America
797 Central Ave., Wyandotte, MI 48192
TEL #: 734.285.5500

Veolia North America
 Industrial Pretreatment Program
 Laboratory Analysis Summary

Permit No: **10804**
 Permittee: Riverview Land Preserve
 007
 Sample Event Date: 07/19/22 0:00

Sampled by:
 Sample ID: 002

METHOD OF ANALYSES CONFORM TO REQUIREMENTS OF THE CODE OF FEDERAL REGULATIONS, 40 CFR, PART 136

Parameter	Analyzed	Method	Units	Result	Result		Permit Limits	
					Flags	In NC	Daily	Monthly
CBOD			mg/L	86			2200	
PFOA		EPA537 Modified	ng/L	440			12000	
PFOS		EPA537 Modified	ng/L	92		NC	12	
pH		SM	S.U.	7.29			5-11.5	
Phenolics		SM	mg/L	0.01			1	
Phosphorus		SM	mg/L	1.80			53.4	
Susp. Solids		SM	mg/L	23			2600	
benzene		SM	mg/L	<.01			2.13	
chlorobenzene		SM	mg/L	<.01			2.13	
Ethylbenzene		SM	mg/L	<.01			2.13	
Toluene		SM	mg/L	<.01			1.0	
Cadmium		SM	mg/L	<.002			0.45	
Copper		SM	mg/L	<.01			1.55	
T.Chromium		SM	mg/L	0.10			10	
Mercury		SM	mg/L	<.0002			0.0002	
Nickel		SM	mg/L	0.099			6	
Lead		SM	mg/L	<.01			1.00	
Silver		SM	mg/L	<.002			0.25	
Zinc		SM	mg/L	<.04			4.5	
Ammonia N		SM	mg/L	800			1000	
Methylene Chlor		SM	mg/L	0.01			1.0	
Bis-(2-et)Phtha		SM	mg/L	<.01			2.13	
Napthalene		SM	mg/L	<.01			2.13	
ylene		SM	mg/L	<.03			2.13	

Reported by:
 Date: August 8, 2022

K Joychand
8/8/2022

Veolia North America
 Industrial Pretreatment Program
 Laboratory Analysis Summary

Permit No: **10804**
 Permittee: Riverview Land Preserve
 004
 Sample Event Date: 07/19/22 0:00

Sampled by:
 Sample ID: 002

METHOD OF ANALYSES CONFORM TO REQUIREMENTS OF THE CODE OF FEDERAL REGULATIONS, 40 CFR, PART 136

Parameter	Analyzed	Method	Units	Result	Result		Permit Limits	
					Flags	In NC	Daily	Monthly
CBOD			mg/L	148			2200	
PFOA		EPA537 Modified	ng/L	1500			12000	
PFOS		EPA537 Modified	ng/L	270		NC	12	
pH		SM	S.U.	7.34			5.0-11.5	
Phenolics		SM	mg/L	2.28		NC	1	
Phosphorus		SM	mg/L	4.38				
Susp. Solids		SM	mg/L	5			2600	
Chloroform		SM	mg/L	<.01			0.25	
Toluene		SM	mg/L	<.01			1	
Cadmium		SM	mg/L	<.002			0.45	
Copper		SM	mg/L	<.01			1.55	
T.Chromium		SM	mg/L	0.40			10	
Mercury		SM	mg/L	<.0002			0.0002	
Nickel		SM	mg/L	0.15			6	
Lead		SM	mg/L	<.01			1.0	
Silver		SM	mg/L	<.002			0.25	
Zinc		SM	mg/L	<.04			4.5	
TTO		SM	mg/L	0.228			2.13	
Volatiles 624		SM	mg/L	0.228				
SemiVolatile625		SM	mg/L	0.019				
BTEX		SM	mg/L	0.016			2.0	
Ammonia N		SM	mg/L	1115				
Methylene Chlor		SM	mg/L	0.011			1	
Tetrachloroethy		SM	mg/L	<.01			0.25	
trichloroethyle		SM	mg/L	<.01			0.5	

Reported by:
 Date: August 8, 2022

R. Joychaw
8/8/2022

Veolia North America
 Industrial Pretreatment Program
 Laboratory Analysis Summary

Permit No: **10804**
 Permittee: Riverview Land Preserve
 003B

Sample Event Date: 07/19/22 0:00

Sampled by:
 Sample ID: 002

METHOD OF ANALYSES CONFORM TO REQUIREMENTS OF THE CODE OF FEDERAL REGULATIONS, 40 CFR, PART 136

Parameter	Analyzed	Method	Units	Result		Permit Limits	
				Result	Flags	Daily	Monthly
CBOD			mg/L	750			2200
PFOA		EPA537 Modified	ng/L	4500			12000
PFOS		EPA537 Modified	ng/L	560		NC	12
pH		SM	S.U.	7.57			5-11.5
Phenolics		SM	mg/L	1.66		NC	1
Phosphorus		SM	mg/L	4.13			53.4
Susp. Solids		SM	mg/L	15			2600
benzene		SM	mg/L	<.01			2.13
chlorobenzene		SM	mg/L	<.01			2.13
Ethylbenzene		SM	mg/L	<.01			2.13
Toluene		SM	mg/L	<.01			1.0
Cadmium		SM	mg/L	<.002			0.45
Copper		SM	mg/L	<.01			1.55
T.Chromium		SM	mg/L	0.20			10
Mercury		SM	mg/L	<.0002			0.0002
Nickel		SM	mg/L	0.15			6
Lead		SM	mg/L	<.01			1.00
Silver		SM	mg/L	<.002			0.25
Zinc		SM	mg/L	0.10			4.5
Ammonia N		SM	mg/L	1020			1000
Methylene Chlor		SM	mg/L	<.01			1.0
Napthalene		SM	mg/L	<.01			2.13
xylene		SM	mg/L	<.03			2.13

KJ
~~NC~~
 8/8/2022

Reported by:
 Date: August 8, 2022

K Joychand
 8/8/2022

July 21, 2023

Kurian Joychan
 Industrial Pretreatment Program Manager
 797 Central Avenue
 Wyandotte, Michigan 48192

Re: Response to Mercury Letter of Violation dated July 13, 2023
 Wastewater Discharge Permit Number D-10804
 Riverview Land Preserve, Riverview Michigan
 Project Number 209-4231588.008

On behalf of the City of Riverview and the Riverview Land Preserve (RLP), Cornerstone Environmental Group, LLC, a wholly owned subsidiary of Tetra Tech (Tetra Tech), is providing this correspondence in response to the Letter of Violation (LOV) dated July 13, 2023 issued by the Downriver Utility Wastewater Authority (DUWA). The LOV addresses a reported Mercury exceedance at discharge point 003B during the second quarter of 2023.

The permit exceedance was noted during review of laboratory data on July 11, 2023 and DUWA was notified within 24-hours via e-mail on July 12, 2023. In accordance with the Permit and the LOV, RLP resampled 003B within 7 days of the notification. The confirmation sample was collected on July 12, 2023 and those results are provided to DUWA with this response. Exceedences of mercury are very rare at the Riverview Land Preserve. We have included a table including roughly the last five years of results at 003B all have been non-detect except for the current results from Second Quarter 2023.

Table 1: Mercury Concentrations 003B		Table 1: Mercury Concentrations 003B	
Date	Concentration (mg/l)	Date	Concentration (mg/l)
2/28/2019	<0.00020	5/6/2021	<0.00020
5/23/2019	<0.00020	8/12/2021	<0.00020
8/15/2019	<0.00020	11/11/2021	<0.00020
10/30/2019	<0.00020	2/24/2022	<0.00020
3/5/2020	<0.00020	5/12/2022	<0.00020
5/21/2020	<0.00020	8/25/2022	<0.00020
8/13/2020	<0.00020	11/17/2022	<0.00020
10/8/2020	<0.00020	2/27/2023	<0.00020
11/12/2020	<0.00020	5/25/2023	0.00061
2/25/2021	<0.00020	7/12/2023	<0.00020

Evaluation of Source

Mr. Kurian Joychan
July 21, 2023

It is not currently known what caused the mercury detection levels in the sample collected for the Second Quarter sampling event. The results from the July 12, 2023 confirmation sample are back in compliance. Discharge location 003B is scheduled to be sampled again during early August as part of the routine third quarterly monitoring event. If mercury is again detected during this event RLP will develop a plan to evaluate the source of the mercury and attempt to prevent future discharges. Results from the August (Third Quarter) sampling event will be provided to DUWA when they are received from the lab.

We trust that this response adequately addresses the mercury exceedance described in the DUWA Letter of Violation dated July 13, 2023. If you need any further information or have any questions regarding this response, please contact me via e-mail or by phone at 734-306-4365.

Sincerely,

CORNERSTONE ENVIRONMENTAL GROUP, LLC - A TETRA TECH COMPANY



Eric Anderson
Project Manager



Jennifer Bowyer
Operations Director

Attachment 1: 003B Mercury data for July 12, 2023 confirmation sample

cc: Kevin Sisk – City of Riverview Solid Waste Director
Randall Pentiuk – City of Riverview Legal Counsel (Electronically)

Mr. Kurian Joychan
July 21, 2023

Attachment 1



July 19, 2023

Kevin Sisk
City of Riverview
20863 Grange Road
Riverview, MI 48193

RE: Project: Riverview LP Sewer Discharge
Pace Project No.: 50349307

Dear Kevin Sisk:

Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Brian Hall
brian.hall@pacelabs.com
(616)975-4500
Project Manager

Enclosures

cc: Cooper Abel, Tetra Tech
Eric Anderson, Tetra Tech
Jennifer Bowyer, Tetra Tech
Jacqui Grimes, City of Riverview



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Riverview LP Sewer Discharge

Pace Project No.: 50349307

Pace Analytical Services Indianapolis

7726 Moller Road, Indianapolis, IN 46268

Illinois Accreditation #: 200074

Indiana Drinking Water Laboratory #: C-49-06

Kansas/TNI Certification #: E-10177

Kentucky UST Agency Interest #: 80226

Kentucky WW Laboratory ID #: 98019

Michigan Drinking Water Laboratory #9050

Ohio VAP Certified Laboratory #: CL0065

Oklahoma Laboratory #: 9204

Texas Certification #: T104704355

Wisconsin Laboratory #: 999788130

USDA Foreign Soil Permit #: 525-23-13-23119

USDA Compliance Agreement #: IN-SL-22-001

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: Riverview LP Sewer Discharge
Pace Project No.: 50349307

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50349307001	003B	Water	07/12/23 08:20	07/13/23 15:51

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Riverview LP Sewer Discharge
Pace Project No.: 50349307

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50349307001	003B	EPA 245.1	EAE	1	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Riverview LP Sewer Discharge

Pace Project No.: 50349307

Sample: 003B		Lab ID: 50349307001	Collected: 07/12/23 08:20	Received: 07/13/23 15:51	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
245.1 Mercury								
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Pace Analytical Services - Indianapolis								
Mercury	<0.00020	mg/L	0.00020	1	07/18/23 11:58	07/18/23 16:31	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Riverview LP Sewer Discharge

Pace Project No.: 50349307

QC Batch:	744072	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50349307001

METHOD BLANK: 3411708 Matrix: Water

Associated Lab Samples: 50349307001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	mg/L	<0.00020	0.00020	07/18/23 16:19	

LABORATORY CONTROL SAMPLE: 3411709

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0050	99	85-115	

MATRIX SPIKE SAMPLE: 3411710

Parameter	Units	50348857001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	ND	0.005	0.0047	95	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3411711 3411712

Parameter	Units	50348607005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.005	0.005	0.0049	0.0048	98	96	70-130	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Riverview LP Sewer Discharge

Pace Project No.: 50349307

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Riverview LP Sewer Discharge
Pace Project No.: 50349307

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50349307001	003B	EPA 245.1	744072	EPA 245.1	744159

REPORT OF LABORATORY ANALYSIS

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Page: _____ of _____

2202500

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location STATE: _____

Section A
Required Client Information:

Company: *Riverview Landfill*
Address: *5063 Grange Rd*
Riverview, NJ
Email To: _____
Phone: _____ Fax: _____

Section B
Required Project Information:

Report To: *Eric Anderson*
Copy To: *eric.anderson@tota-tech.com*
Purchase Order No.: _____
Project Name: _____
Project Number: _____

Company Name: _____
Address: _____
Pace Quote Reference: _____
Pace Project Manager: _____
Pace Profile #: _____

Requested Due Date/TAT: _____

ITEM #	Section D Required Client Information	Section E Matrix Codes MATRIX / CODE	Section F MATRIX CODE (see valid codes to left)	Section G SAMPLE TYPE (G=GRAB C=COMP)	Section H COLLECTED		Section I SAMPLE TEMP AT COLLECTION	Section J # OF CONTAINERS	Section K Preservatives	Section L Y/N	Section M Requested Analysis Filtered (Y/N)	Section N Pace Project No. / Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB						
1	SAMPLE ID (A-Z, 0-9 / -)	DW WT WW P SL OL WP AR TS OT			DATE: <i>7/12/13</i> TIME: <i>8:26</i>							
2	<i>003B</i>				DATE: _____ TIME: _____							
3					DATE: _____ TIME: _____							
4					DATE: _____ TIME: _____							
5					DATE: _____ TIME: _____							
6					DATE: _____ TIME: _____							
7					DATE: _____ TIME: _____							
8					DATE: _____ TIME: _____							
9					DATE: _____ TIME: _____							
10					DATE: _____ TIME: _____							
11					DATE: _____ TIME: _____							
12					DATE: _____ TIME: _____							

Section O
ADDITIONAL COMMENTS

Eric Anderson
D. Sil Pace

Section P
RELINQUISHED BY / AFFILIATION

Eric Anderson
D. Sil Pace

Section Q
DATE

7/12/13
7/12/13

Section R
TIME

1:00
15:51

Section S
ACCEPTED BY / AFFILIATION

Eric Anderson
D. Sil Pace

Section T
DATE

7/12/13
7/12/13

Section U
TIME

13:00
15:51

Section V
SAMPLE CONDITIONS

Received on _____
Ice (Y/N) _____
Sealed Cooler (Y/N) _____
Custody (Y/N) _____
Samples Intact (Y/N) _____

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



Sample Conditions Upon Receipt Form (SCUR)

WO# : 50349307
 PM: BJH Due Date: 07/28/23
 CLIENT: GR-Riverview

Date/Time: 7/13/23 Evaluated By: [Signature]
 Client: RIVERVIEW PM: [Signature]
 Lab Notified of Rush or Short Holds: YES NO

Project Received Via: FedEx UPS Client Pace Courier Other: _____ Comments:

Custody Seal Present and Intact:	YES	NO	<input checked="" type="checkbox"/> N/A
Received Sample Information Form (SIF): Drinking Waters Only	YES	NO	<input checked="" type="checkbox"/> N/A
Short Hold Present (≤ 48 Hours):	YES	<input checked="" type="checkbox"/> NO	
Sample Received in Hold:	<input checked="" type="checkbox"/> YES	NO	
Custody Signature Present:	<input checked="" type="checkbox"/> YES	NO	
Collector Signature Present:	<input checked="" type="checkbox"/> YES	NO	
Sample Collected Today and On Ice:	YES	NO	<input checked="" type="checkbox"/> N/A

IR Gun #: 350 351 Temp. should be 0°C - 6°C (Initial/Corrected)
 Ice Type: WET Bagged / WET Loose BLUE NONE
 1. Cooler Temp. Upon Receipt: 2.5 / 2.7 °C
 Ice Location: TOP BOTTOM MIDDLE DISPERSED
 2. Cooler Temp. Upon Receipt: _____ °C

Temp Blank Received:	YES	<input checked="" type="checkbox"/> NO	
Sample Label Matches COC (ID/Date/Time):	<input checked="" type="checkbox"/> YES	NO	
Container Intact:	<input checked="" type="checkbox"/> YES	NO	
Correct Container:	<input checked="" type="checkbox"/> YES	NO	
Sufficient Volume:	<input checked="" type="checkbox"/> YES	NO	

Sample pH Acceptable: All containers needing preservation are found to be in compliance with EPA recommendation
 pH Strip Lot #: HC312532
 Exceptions are VOA, coliform, LLHg, O&G/TPH, or any container with a septum cap or preserved with HCl
 YES NO N/A
SEE NCF

Residual Chlorine Absent: Cl₂ Strip Lot #: _____
 Applies to SVOC 625, PCB/Pest. 608, Total/Amenable Cyanide
 YES NO N/A

VOA Headspace Acceptable (<6mm):
 YES NO N/A

Trip Blank Received: HCl MeOH Other: _____
 YES NO ON HOLD

Comments:
 3. Cooler Temp. Upon Receipt: _____ °C
 4. Cooler Temp. Upon Receipt: _____ °C
 Non-Conformance Form Required: YES NO

[Signature]
 7/13/23

WO#: 50349307

PM: BJH Due Date: 07/28/23
CLIENT: GR-Riverview

Sample Receiving Non-Conformance Form (NCF)

Sample Integrity Issues:

Check issues below and add details where appropriate

COC Integrity Issues:

Check issues below and add details where appropriate

Date: 7/13/23	COC does not match samples received (missing, additional, etc.)	Custody seal(s) damaged or missing on coolers, samples, or trip blanks	*Insufficient sample volume received
Evaluated by: SN	COC sample ID does not match sample label	Cooler or sample container broken or compromised	*Sample contains residual chlorine
Client: RIVERVIEW LP	*COC collection date/time missing or does not match sample label	*Sample past holding time	✓ Improper preservation
*Drinking Water Deficiency: Samples may be invalid. Analysis must not proceed without client written permission.	*Analyses/ analytes missing or clarification needed	*Temperature not within acceptance criteria (typically 0-6°C)	*Sample contains interferences (multi-phasic, solids, color, odor, etc...)
	*Required signatures are missing	*Sample arrived frozen or partially frozen	Vial(s) received with improper headspace (>6mm)
*No Sample Information Form (SIF) received with sample(s)	*Residual Chlorine presence/absence not indicated on COC	*Incorrect or improper containers received	Other: See notes below

COC				Sample Label				Sample Notes		
Sample ID	Date	Time	Container Type	Quantity	Sample ID	Date	Time		Container Type	Quantity
					003B			3P3N		PH=7

General Comments/ Client Instructions:

APPENDIX B: OPINION OF PROBABLE COSTS

DRAFT

RLP LTP

SRF Project Plan

Present Worth Back-up Calculations

The present worth calculations were performed using a discount factor of 0.3 percent over a 20 year period, which is the requested term of the SRF loan.

The salvage values were calculated by evaluating each line of the opinions of probable cost and classifying the item as one of the following:

- Civil/Site Work/Piping – site improvements, grading and piping
- Structures – includes new buildings and concrete flooring
- Mechanical – includes process equipment; pumps; and heating, and ventilation
- Electrical/Other – includes electrical equipment, instrumentation, and other items that do not fit into another category
- Engineering – costs associated with the design and construction
- Contingencies – additional costs to account for unknown factors prior to final design

The costs for each category were added for each process area. The service life assigned to each category is summarized in Table B-1.

Table B-1. Service Life by Category

Category	Service Life
Civil/Site Work/Piping	40
Structures	40
Mechanical	20
Electrical/Other	20
Engineering	20
Contingencies	20

The cost assignments are included with the opinions of probable costs, included herein (Appendix B).

No assets were assigned a salvage value. The life span of landfill and service life of the equipment will correspond.

The O&M costs predominantly consist of energy usage. The assumptions used to develop the O&M costs for Alternatives A, B and C can be found in the tables that are included in this appendix (Appendix B).



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331

Telephone: (877) 633-5520

PROJECT: RLP SRF Project Plan

DATE: 3/18/24

LOCATION: Riverview, Michigan

PROJECT NO. 4231588

BASIS FOR ESTIMATE: CONCEPTUAL PRELIMINARY FINAL

ESTIMATOR: NRS

WORK: Alternative A - GAC and FF

CHECKED BY: AK

Leachate Treatment Plant

Design Summary

Alternative A

Construction and Equipment Costs Summary

	Total Project Costs	Service Life	Present Worth of Capital Investments	Salvage Value at End of Planning Period	Net Present Worth (Cost)
Civil/Site Work/Piping	\$632,588	40	\$632,588	\$0	\$632,588
Structures	\$889,400	40	\$889,400	\$0	\$889,400
Mechanical	\$4,973,475	20	\$4,973,475	\$0	\$4,973,475
Electrical/Other	\$277,880	20	\$277,880	\$0	\$277,880
Engineering	\$880,534	20	\$880,534	\$0	\$880,534
Contingencies	\$1,148,081	20	\$1,148,081	\$0	\$1,148,081
Total Capital Cost	\$8,801,958			Total	\$8,801,958

Annual Costs (O&M) Summary

Type	Annual Cost	Net Present Worth of O&M
O&M	\$1,638,800	\$31,743,557

Total \$31,743,557

Net Present Worth \$40,545,515

Weighted Useful Life (years) 23.46

Assumptions:

Present Worth Factor Salvage Value --

Present Worth Factor O&M 19.37

Discount Rate (%) 0.3

Planning Period (years) 20

Weighted Useful Life = ((Item Cost A * Service Life A)+(Item Cost B * Service Life B) + (etc.)) / (Total Capital Cost)



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331
 PROJECT: RLP SRF Project Plan
 LOCATION: Riverview, Michigan
 BASIS FOR ESTIMATE: [X] CONCEPTUAL [] PRELIMINARY [] FINAL
 WORK: Alternative B - GAC and FF
 Leachate Treatment Plant

Telephone: (877) 633-5520
 DATE: 3/18/24
 PROJECT NO. 4231588
 ESTIMATOR: NRS
 CHECKED BY: AK

Design Summary
 Alternative B

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT		Civil/Site Work/Piping	Structure	Mechanical	Other	Engineering	Contingencies
1	General Conditions	2	LS	\$100,000.00	\$200,000		\$200,000					
2	Mobilization/Demobilization	2	LS	\$75,000.00	\$150,000		\$150,000					
3	Existing Equipment Removals, Demolition	2	LS	\$50,000.00	\$100,000		\$100,000					
4	Deliver and install SAFF Unit	2	LS	\$20,000.00	\$40,000				\$40,000			
5	Deliver and install Oil/Water Separator	2	LS	\$5,000.00	\$10,000				\$10,000			
6	Deliver and install Lamella Clarifier	2	LS	\$25,000.00	\$50,000				\$50,000			
7	Install 4-inch SCH 80 PVC Piping, Hangers, and assoc. Equipment	800	LF	\$50.00	\$40,000		\$40,000					
8	Program Process Automation and Controls	2	LS	\$15,000.00	\$30,000				\$30,000			
9	Pressure and Hydraulic Testing	2	LS	\$5,000.00	\$10,000				\$10,000			
10	Leachate Disposal During Construction	1,680,000	GAL	\$0.13	\$215,880					\$215,880		
11	Process Optimization and Training by EPOC Enviro	50	HR	\$1,000.00	\$50,000					\$50,000		
12	New EQ Tank	1	EA	\$500,000.00	\$500,000				\$500,000			
13	New LTP Building	1	EA	\$389,400.00	\$389,400			\$389,400				
14	Other Mis Costs for New Building Construction	1	EA	\$500,000.00	\$500,000			\$500,000				
15	SAFF40 Unit	2	Unit	\$1,800,000.00	\$3,600,000				\$3,600,000			
16	Oil water separator	2	Unit	\$35,600.00	\$71,200				\$71,200			
17	Lamella Clarifier	2	LS	\$128,400.00	\$256,800				\$256,800			
18	Flocculant and Coagulant Mixers	2	LS	\$4,022.28	\$8,045				\$8,045			
19	Bulk Chemical Storage Tank	2	LS	\$7,715.22	\$15,430				\$15,430			
20	Sampling ports	40	Unit	\$50.00	\$2,000				\$2,000			
21	GAC System	1	LS	\$380,000.00	\$380,000				\$380,000			
22	Concrete Pad	2000	SF	\$18.90	\$37,800		\$37,800					
23	SAFF Unit Supports	12	EA	\$399.00	\$4,788		\$4,788					
24	Leachate Transfer Pump Stations	2	EA	\$50,000.00	\$100,000		\$100,000					
25												
26												
27												
28												
29												
30												
31												
32												
33	Electrical				\$12,000					\$12,000		
34	Contingency	15	%		\$1,148,081							\$1,148,081
35	Engineering	13	%		\$880,534						\$880,534	
TOTAL CONSTRUCTION COST					\$8,801,958	Total	\$632,588	\$889,400	\$4,973,475	\$277,880	\$880,534	\$1,148,081



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331

PROJECT: RLP SRF Project Plan

LOCATION: Riverview, Michigan

BASIS FOR ESTIMATE: CONCEPTUAL PRELIMINARY FINAL

WORK: Alternative B - GAC and IX

Leachate Treatment Plant

Telephone: (877) 633-5520

DATE: 3/18/24

PROJECT NO. 4231588

ESTIMATOR: NRS

CHECKED BY: AK

Design Summary

Alternative B

Construction and Equipment Costs Summary

	Total Project Costs	Service Life	Present Worth of Capital Investments	Salvage Value at End of Planning Period	Net Present Worth (Cost)
Civil/Site Work/Piping	\$738,000	40	\$738,000	\$0	\$738,000
Structures	\$889,400	40	\$889,400	\$0	\$889,400
Mechanical	\$1,941,461	20	\$1,941,461	\$0	\$1,941,461
Electrical/Other	\$515,760	20	\$515,760	\$0	\$515,760
Engineering	\$531,001	20	\$531,001	\$0	\$531,001
Contingencies	\$692,343	20	\$692,343	\$0	\$692,343
Total Capital Cost	\$ 5,307,965			Total	\$5,307,965

Annual Costs (O&M) Summary

Type	Annual Cost	Net Present Worth of O&M
O&M	\$1,791,205	\$34,695,654

Total	\$34,695,654
Net Present Worth	\$40,003,619
Weighted Useful Life (years)	26.13

Assumptions:

Present Worth Factor Salvage Value

--

Present Worth Factor O&M

19.37

Discount Rate (%)

0.3

Planning Period (years)

20

Weighted Useful Life = ((Item Cost A * Service Life A)+(Item Cost B * Service Life B) + (etc.)) / (Total Capital Cost)



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331
 PROJECT: RLP SRF Project Plan
 LOCATION: Riverview, Michigan
 BASIS FOR ESTIMATE: CONCEPTUAL PRELIMINARY FINAL
 WORK: Alternative B - GAC and IX
 Leachate Treatment Plant

Telephone: (877) 633-5520
 DATE: 3/18/24
 PROJECT NO. 4231588
 ESTIMATOR: NRS
 CHECKED BY: AK

Design Summary

Alternative B

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT		Civil/Site Work/Piping	Structure	Mechanical	Other	Engineering	Contingencies
1												
2	Bulk Chemical Storage Tank	2	LS	\$7,715.22	\$15,430				\$15,430			
3	Pumps, total	2	LS	\$14,993.61	\$29,987				\$29,987			
4	Flow Meters, total	2	LS	\$13,684.35	\$27,369				\$27,369			
5	Actuated and Manual Valves	2	LS	\$4,459.11	\$8,918				\$8,918			
6	Flocculant and Coagulant Mixers	2	LS	\$4,022.28	\$8,045				\$8,045			
7	Level Sensors/Transmitters	2	LS	\$2,330.99	\$4,662				\$4,662			
8	IX Vessels	2	LS	\$59,950.00	\$119,900				\$119,900			
9	Air Compressor	2	LS	\$15,455.99	\$30,912				\$30,912			
10	Hot Water Heater	2	LS	\$469.00	\$938				\$938			
11	Lamella Clarifier	2	LS	\$128,400.00	\$256,800				\$256,800			
12	Dynasand Filter	2	LS	\$100,000.00	\$200,000				\$200,000			
13	Sampling ports	70	Unit	\$50.00	\$3,500				\$3,500			
14	GAC System	1	LS	\$380,000.00	\$380,000				\$380,000			
15	General Conditions	2	LS	\$200,000.00	\$400,000		\$400,000					
16	Mobilization/Demobilization	1	LS	\$150,000.00	\$150,000		\$150,000					
17	Existing Equipment Removals, Demolition	2	LS	\$50,000.00	\$100,000		\$100,000					
18	Tank and Equipment Mounts	32	EA	\$1,500.00	\$48,000		\$48,000					
19	Existing Equipment Relocation and Installation	4	EA	\$5,000.00	\$20,000				\$20,000			
20	Deliver and Install DyanSand Filter	2	EA	\$30,000.00	\$60,000				\$60,000			
21	Deliver and Install Lamella Clarifier	2	EA	\$25,000.00	\$50,000				\$50,000			
22	Deliver and Install IX System	2	EA	\$15,000.00	\$30,000				\$30,000			
23	Deliver and Install Pumps	2	EA	\$2,500.00	\$5,000				\$5,000			
24	Deliver and Install Instrumentation	2	LS	\$35,000.00	\$70,000				\$70,000			
25	Install 4-inch SCH 80 PVC Piping, Hangers, and assoc. Equipment	800	FT	\$50.00	\$40,000		\$40,000					
27	Program Process Automation and Controls	2	LS	\$50,000.00	\$100,000				\$100,000			
28	Pressure and Hydraulic Testing	2	LS	\$10,000.00	\$20,000				\$20,000			
29	Leachate Disposal During Construction	3,360,000	GAL	\$0.13	\$431,760					\$431,760		
30	System Start-up and Training	80	HR	\$150.00	\$12,000					\$12,000		
31	New EQ Tank	1	EA	\$500,000.00	\$500,000				\$500,000			
32	New LTP Building	1	EA	\$389,400.00	\$389,400			\$389,400				
33	Other Mis Costs for New Building Construction	1	EA	\$500,000.00	\$500,000			\$500,000				
34												
35												
37	Electrical				\$72,000					\$72,000		
38	Contingency	15	%		\$692,343							\$692,343
39	Engineering	13	%		\$531,001						\$531,001	
	TOTAL CONSTRUCTION COST				\$5,307,965	Total	\$738,000	\$889,400	\$1,941,461	\$515,760	\$531,001	\$692,343



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331

PROJECT: RLP SRF Project Plan

LOCATION: Riverview, Michigan

BASIS FOR ESTIMATE: CONCEPTUAL PRELIMINARY FINAL

WORK: Alternative C - RO

Telephone: (877) 633-5520

DATE: 3/18/24

PROJECT NO. 4231588

ESTIMATOR: NRS

CHECKED BY: AK

Leachate Treatment Plant

Design Summary

Alternative C

Construction and Equipment Costs Summary

	Total Project Costs	Service Life	Present Worth of Capital Investments	Salvage Value at End of Planning Period	Net Present Worth (Cost)
Civil/Site Work/Piping	\$1,337,500	40	\$1,337,500	\$0	\$1,337,500
Structures	\$897,963	40	\$889,400	\$0	\$897,963
Mechanical	\$6,241,300	20	\$6,241,300	\$0	\$6,241,300
Electrical/Other	\$575,760	20	\$575,760	\$0	\$575,760
Engineering	\$1,111,828	20	\$1,111,828	\$0	\$1,111,828
Contingencies	\$1,449,653	20	\$1,449,653	\$0	\$1,449,653
Total Capital Cost	\$11,614,004			Total	\$11,614,004

Annual Costs (O&M) Summary

Type	Annual Cost	Net Present Worth of O&M
O&M	\$1,638,800	\$26,961,891

Total \$26,961,891

Net Present Worth \$38,575,895

Weighted Useful Life (years) 23.85

Assumptions:

Present Worth Factor Salvage Value

--

Present Worth Factor O&M

19.37

Discount Rate (%)

0.3

Planning Period (years)

20

Weighted Useful Life = ((Item Cost A * Service Life A)+(Item Cost B * Service Life B) + (etc.)) / (Total Capital Cost)



OPINION OF PROBABLE CONSTRUCTION COST

39395 W 12 Mile Road, Suite 103, Farmington Hills, MI 48331

Telephone: (877) 633-5520

PROJECT: RLP SRF Project Plan

DATE: 3/18/24

LOCATION: Riverview, Michigan

PROJECT NO. 4231588

BASIS FOR ESTIMATE: CONCEPTUAL PRELIMINARY FINAL

ESTIMATOR: NRS

WORK: Alternative C - RO

CHECKED BY: AK

Leachate Treatment Plant

Design Summary

Alternative C

ITEM NO.	DESCRIPTION	QUANT.	UNIT	UNIT AMOUNT	TOTAL AMOUNT		Civil/Site Work/Piping	Structure	Mechanical	Other	Engineering	Contingencies
1	RO Treatment System Equipment, Start-up and Training	1	LS	\$2,165,800.00	\$2,165,800				\$2,165,800			
2	Acid Storage Tank	1	EA	\$5,000.00	\$5,000				\$5,000			
3	Influent Piping from Equalization Tanks to Treatment Plant	400	FT	\$50.00	\$20,000		\$20,000					
4	Influent Pump Station	2	EA	\$100,000.00	\$200,000		\$200,000					
5	General Conditions	1	LS	\$500,000.00	\$500,000		\$500,000					
6	Mobilization/Demobilization	1	LS	\$200,000.00	\$200,000		\$200,000					
7	Site/Survey	1	LS	\$100,000.00	\$100,000		\$100,000					
8	Soil Erosion and Sediment Control	1	LS	\$50,000.00	\$50,000		\$50,000					
9	Demolition and Removal of Existing Equipment	4	LS	\$50,000.00	\$200,000		\$200,000					
10	Tank and Equipment Mounts	10	EA	\$1,500.00	\$15,000		\$15,000					
11	Deliver and Install RO Equipment Skids	2	EA	\$50,000.00	\$100,000				\$100,000			
12	Deliver and Install RO Storage Tanks (Larger Tanks)	3	EA	\$20,000.00	\$60,000				\$60,000			
13	Deliver and Install RO and Acid Storage Tanks (Smaller Tanks)	3	EA	\$10,000.00	\$30,000				\$30,000			
14	Deliver and Install Permeate Degassifier	1	EA	\$20,000.00	\$20,000				\$20,000			
15	Deliver and Install Pump Skids	9	EA	\$10,000.00	\$90,000				\$90,000			
16	Install New Piping and Appurtenances	800	FT	\$50.00	\$40,000				\$40,000			
17	Acid Feed Pumps and Appurtenances	2	EA	\$16,000.00	\$32,000				\$32,000			
19	Program Process Automation and Controls	4	LS	\$50,000.00	\$200,000				\$200,000			
20	Pressure and Hydraulic Testing	4	LS	\$10,000.00	\$40,000				\$40,000			
21	Leachate Disposal During Construction	3,360,000	GAL	\$0.13	\$431,760					\$431,760		
22	New EQ Tank	2	EA	\$500,000.00	\$1,000,000				\$1,000,000			
23	New LTP Building	1	EA	\$389,400.00	\$389,400			\$389,400				
24	Other Mis Costs for New Building Construction	1	EA	\$500,000.00	\$500,000			\$500,000				
25	RO Treatment System Equipment, Start-up and Training	1	LS	\$2,451,000.00	\$2,451,000				\$2,451,000			
26	Acid Storage Tank	1	EA	\$2,500.00	\$2,500				\$2,500			
27	Existing Storage Tank for Feed (6,000 gal)	1	EA	-\$10,000.00	-\$10,000				-\$10,000			
28	Existing Storage Tank for Permeate (5,000 gal)	1	SA	-\$10,000.00	-\$10,000				-\$10,000			
29	Existing Storage Tank for Residual (3,000 gal)	1	EA	-\$5,000.00	-\$5,000				-\$5,000			
30	Heat Trace and Insulate Tanks Credit	6	EA	-\$40,000.00	-\$240,000				-\$240,000			
31	Concrete Pad	1750	SF	\$18.90	\$33,075			\$33,075				
32	Overhang for Weather Protection for Equipment Outside	1750	SF	\$15.35	\$26,863			\$26,863				
33	Less Concrete Pad	1500	SF	-\$18.90	-\$28,350			-\$28,350				
34	Less Overhand	1500	SF	-\$15.35	-\$23,025			-\$23,025				
35	Tank and Equipment Mounts	10	EA	\$1,500.00	\$15,000				\$15,000			
36	Deliver and Install RO Equipment Skids	2	EA	\$50,000.00	\$100,000				\$100,000			
37	Deliver and Install RO Storage Tanks (Larger Tanks)	3	EA	\$20,000.00	\$60,000				\$60,000			
38	Deliver and Install RO and Acid Storage Tanks (Smaller Tanks)	3	EA	\$10,000.00	\$30,000				\$30,000			
39	Deliver and Install Permeate Degassifier	1	EA	\$20,000.00	\$20,000				\$20,000			
40	Deliver and Install Pump Skids	9	EA	\$10,000.00	\$90,000				\$90,000			
41	Install New Piping and Appurtenances	800	FT	\$50.00	\$40,000		\$40,000					
42	Heat Trace and Insulate Piping	500	FT	\$100.00	\$50,000		\$50,000					
43	Heat Trace and Insulate Piping Credit	375	FT	-\$100.00	-\$37,500		-\$37,500					
44	Existing Tank Re-Use Install	3	EA	-\$15,000.00	-\$45,000				-\$45,000			
45												
46												
47	Electrical				\$144,000					\$144,000		
48	Contingency	15	%		\$1,449,653							\$1,449,653
49	Engineering	13	%		\$1,111,828						\$1,111,828	
	TOTAL CONSTRUCTION COST				\$11,614,004	Total	\$1,337,500	\$897,963	\$6,241,300	\$575,760	\$1,111,828	\$1,449,653

APPENDIX C: CORRESPONDENCE

DRAFT

RLP

BIOLOGICAL ANALYSIS

Prepared using IPaC

Generated by Nicole Shanks (nicole.shanks@tetrattech.com)

February 28, 2024

The purpose of this document is to assess the effects of the proposed project and determine whether the project may affect any federally threatened, endangered, proposed, or candidate species. If appropriate for the project, this document may be used as a biological assessment (BA), as it is prepared in accordance with legal requirements set forth under [Section 7 of the Endangered Species Act \(16 U.S.C. 1536 \(c\)\)](#).

In this document, any data provided by U.S. Fish and Wildlife Service is based on data as of February 28, 2024.

Prepared using IPaC version 6.105.1-rc1

RLP BIOLOGICAL ASSESSMENT

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1 DESCRIPTION OF THE ACTION

1.1 PROJECT NAME

RLP

1.2 EXECUTIVE SUMMARY

Modifications to the Leachate Treatment Plant for a landfill. System will wither be modified within the building, next to or at the existing CNG Station. Area of modifications will occur on the property of the landfill which completed an approved Environmental Assessment when it was first approved.

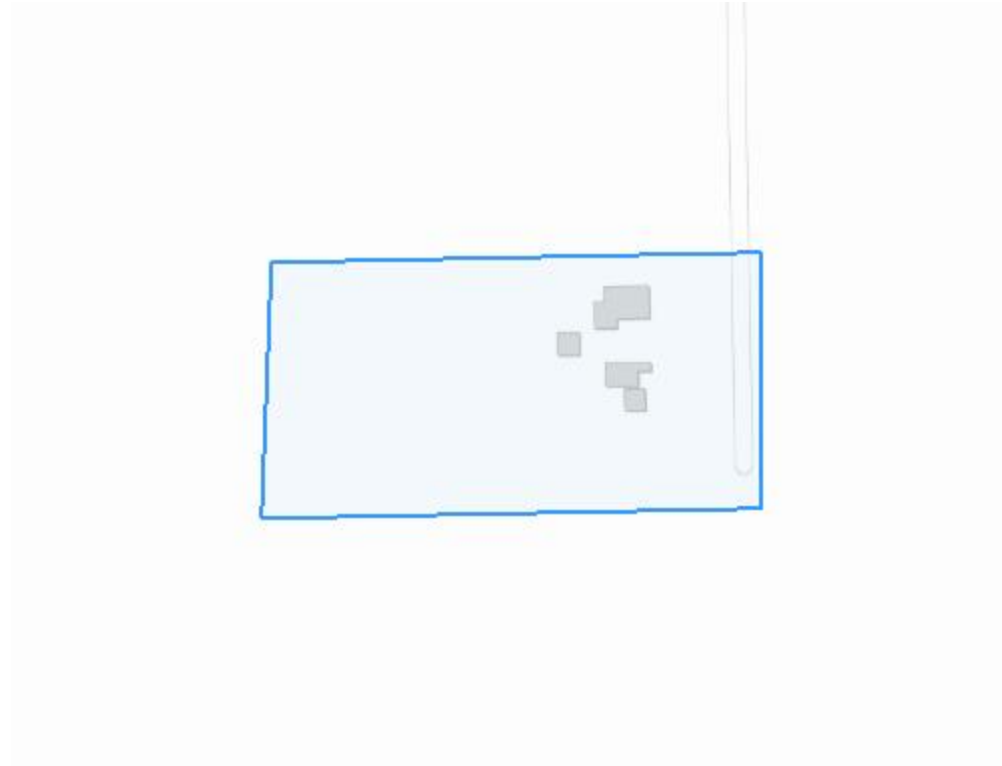
1.3 EFFECT DETERMINATION SUMMARY

SPECIES (COMMON NAME)	SCIENTIFIC NAME	LISTING STATUS	PRESENT IN ACTION AREA	EFFECT DETERMINATION
Eastern Massasauga (=rattlesnake)	Sistrurus catenatus	Threatened	No	NE
Eastern Prairie Fringed Orchid	Platanthera leucophaea	Threatened	No	NE
Indiana Bat	Myotis sodalis	Endangered	No	NE
Monarch Butterfly	Danaus plexippus	Candidate	Excluded from analysis	Excluded from analysis
Northern Long-eared Bat†. This species or critical habitat is covered by a DKey.	Myotis septentrionalis	Endangered		NE
Northern Riffleshell	Epioblasma rangiana	Endangered	No	NE
Rufa Red Knot	Calidris canutus rufa	Threatened	No	NE
Tricolored Bat	Perimyotis subflavus	Proposed Endangered	Excluded from analysis	Excluded from analysis

† This species or critical habitat is covered by a DKey.

1.4 PROJECT DESCRIPTION

1.4.1 LOCATION



LOCATION

Wayne County, Michigan

1.4.2 DESCRIPTION OF PROJECT HABITAT

Landfill and support buildings

1.4.3 PROJECT PROPONENT INFORMATION

Provide information regarding who is proposing to conduct the project, and their contact information. Please provide details on whether there is a Federal nexus.

REQUESTING AGENCY

Private Entity

FULL NAME

Nicole Shanks

STREET ADDRESS

39395 W. Twelve Mile Road

Suite 103

CITY

Farmington Hills

STATE

MI

ZIP

48331

PHONE NUMBER

9472464301

E-MAIL ADDRESS

nicole.shanks@tetrattech.com

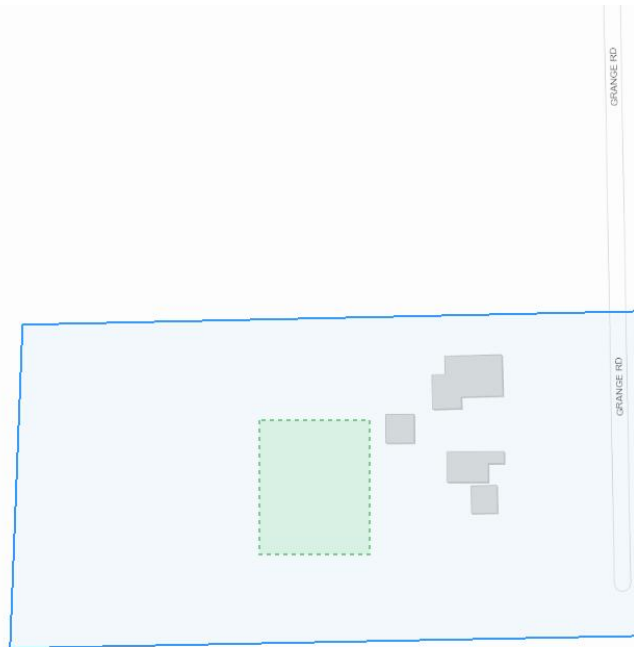
1.4.4 PROJECT PURPOSE

The project includes modifications to the LTP and potential building of an additional LTP in the former area of the CNG Station.

1.4.5 PROJECT TYPE AND DECONSTRUCTION


This project is a wastewater treatment plant construction project.

1.4.5.1 PROJECT MAP



LEGEND

 Project footprint

 Layer 1: Construct building, geotechnical investigation, in-ground utilities construction, install specific wastewater treatment components, landscaping/restoration, maintain access road, rough grading, wastewater treatment plant (structure)

1.4.5.2 WASTEWATER TREATMENT PLANT

STRUCTURE COMPLETION DATE

January 01, 2026

REMOVAL/DECOMMISSION DATE (IF APPLICABLE)

Not applicable

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

Changes to the LTO will either occur in the building or in area covered by concrete.

1.4.5.3 CONSTRUCT BUILDING

ACTIVITY START DATE

January 01, 2026

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

The changes to the system will either occur in the building or on existing concrete

1.4.5.4 GEOTECHNICAL INVESTIGATION

ACTIVITY START DATE

January 01, 2025

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

Located in area with concrete that has already been disturbed

1.4.5.5 IN-GROUND UTILITIES CONSTRUCTION

ACTIVITY START DATE

January 01, 2026

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

The changes to the system will either occur in the building or on existing concrete.
Utilities already existing

1.4.5.6 INSTALL SPECIFIC WASTEWATER TREATMENT COMPONENTS

ACTIVITY START DATE

January 01, 2026

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

The changes to the system will either occur in the building or on existing concrete

1.4.5.7 LANDSCAPING/RESTORATION

ACTIVITY START DATE

January 01, 2026

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

The changes to the system will either occur in the building or on existing concrete.
May involve minor landscaping

1.4.5.8 MAINTAIN ACCESS ROAD

ACTIVITY START DATE

January 01, 2025

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

DESCRIPTION

Access road already existing

1.4.5.9 ROUGH GRADING

ACTIVITY START DATE

January 01, 2025

ACTIVITY END DATE

Unspecified

STRESSORS

This activity is not expected to have any impact on the environment.

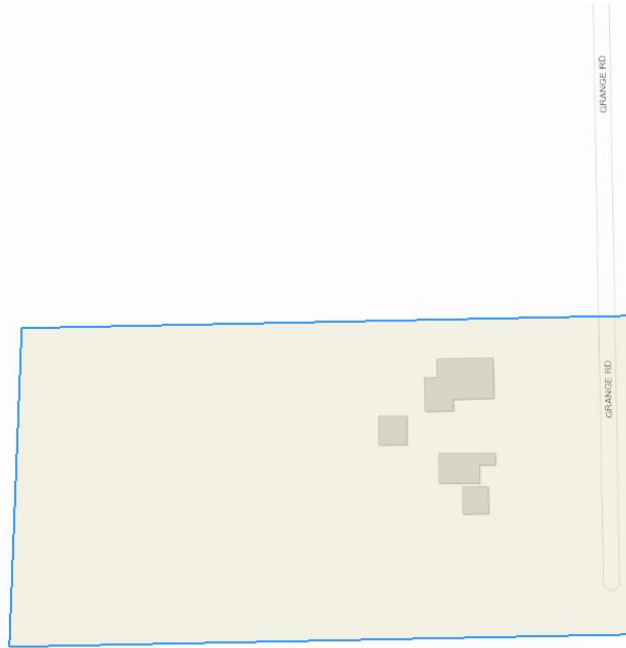
DESCRIPTION

The changes to the system will either occur in the building or on existing concrete

1.4.6 ANTICIPATED ENVIRONMENTAL STRESSORS

Describe the anticipated effects of your proposed project on the aspects of the land, air and water that will occur due to the activities above. These should be based on the activity deconstructions done in the previous section and will be used to inform the action area.

1.5 ACTION AREA



LEGEND



Project footprint



Stressor location

1.6 CONSERVATION MEASURES

Describe any proposed measures being implemented as part of the project that are designed to reduce the impacts to the environment and their resulting effects to listed species. To avoid extra verbiage, don't list measures that have no relevance to the species being analyzed.

No conservation measures have been selected for this project.

1.7 PRIOR CONSULTATION HISTORY

No recent History

1.8 OTHER AGENCY PARTNERS AND INTERESTED PARTIES

State Agency - Michigan

1.9 OTHER REPORTS AND HELPFUL INFORMATION

NA

2 SPECIES EFFECTS ANALYSIS

This section describes, species by species, the effects of the proposed action on listed, proposed, and candidate species, and the habitat on which they depend. In this document, effects are broken down as direct interactions (something happening directly to the species) or indirect interactions (something happening to the environment on which a species depends that could then result in effects to the species).

These interactions encompass effects that occur both during project construction and those which could be ongoing after the project is finished. All effects, however, should be considered, including effects from direct and indirect interactions and cumulative effects.

2.1 EASTERN MASSASAUGA (=RATTLESNAKE)

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the building and in the area of CNG Station

2.2 EASTERN PRAIRIE FRINGED ORCHID

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station

2.3 INDIANA BAT

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station. No trees will be removed

2.4 MONARCH BUTTERFLY

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station

2.5 NORTHERN RIFFLESHELL

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station

2.6 RUFA RED KNOT

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station. No trees will be removed

2.7 TRICOLORED BAT

This species has been excluded from analysis in this environmental review document.

JUSTIFICATION FOR EXCLUSION

Concrete around the LTP and CNG Station. No trees will be removed

3 CRITICAL HABITAT EFFECTS ANALYSIS

No critical habitats intersect with the project action area.

4 SUMMARY DISCUSSION AND CONCLUSION

4.1 SUMMARY DISCUSSION

The area of concern includes a Leachate Treatment PLant and concrete from either the LTP or CNG Station. No addition area will be disturbed.

4.2 CONCLUSION

No addition area will be disturbed beyond the existing buildings or surrounding concrete pads



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Michigan Ecological Services Field Office
2651 Coolidge Road Suite 101
East Lansing, MI 48823-6360
Phone: (517) 351-2555 Fax: (517) 351-1443

In Reply Refer To:
Project Code: 2024-0055420
Project Name: RLP

February 28, 2024

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see [Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service \(fws.gov\)](#).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Michigan Ecological Services Field Office

2651 Coolidge Road Suite 101

East Lansing, MI 48823-6360

(517) 351-2555

PROJECT SUMMARY

Project Code: 2024-0055420

Project Name: RLP

Project Type: Wastewater Facility - Maintenance / Modification

Project Description: LTP

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@42.165852799999996,-83.21337774610791,14z>



Counties: Wayne County, Michigan

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/B4TAFPIKMBCTJKY2A3UIDCAL3Q/documents/generated/6982.pdf	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Rufa Red Knot <i>Calidris canutus rufa</i> There is proposed critical habitat for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

NAME	STATUS
Eastern Massasauga (=rattlesnake) <i>Sistrurus catenatus</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ For all Projects: Project is within EMR Range Species profile: https://ecos.fws.gov/ecp/species/2202 General project design guidelines: https://ipac.ecosphere.fws.gov/project/B4TAFPIMKBCTJKY2A3UIDCAL3Q/documents/generated/5280.pdf	Threatened

CLAMS

NAME	STATUS
Northern Riffleshell <i>Epioblasma rangiana</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/527	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Eastern Prairie Fringed Orchid <i>Platanthera leucophaea</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Nicole Shanks
Address: 39395 W. Twelve Mile Road
Address Line 2: Suite 103
City: Farmington Hills
State: MI
Zip: 48331
Email: nicole.shanks@tetrattech.com
Phone: 9472464301

Michigan Natural Features Inventory

MSU Extension

County Element Data

The lists include all elements (species and natural communities) for which locations have been recorded in MNFI's database for each county. Information from the database cannot provide a definitive statement on the presence, absence, or condition of the natural features in any given locality, since much of the state has not been specifically or thoroughly surveyed for their occurrence and the conditions at previously surveyed sites are constantly changing. The County Elements Lists should be used as a reference of which natural features currently or historically were recorded in the county and should be considered when developing land use plans.

Choose a county

Wayne County

[Code Definitions](#)

Species

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
Acipenser fulvescens	Lake sturgeon		.I	G3 G4	S2	8	2016
Adlumia fungosa	Climbing fumitory		.I	G4	S3	1	1929
Alasmidonta marginata	Elktoe		SC	G4	S3?	9	2020
Alasmidonta viridis	Slippershell		.I	G4 G5	S2 S3	9	1933
Ambystoma texanum	Small-mouthed salamander		E	G5	S1	1	2001
Ammocrypta pellucida	Eastern sand darter		.I	G4	S1 S2	1	1936
Ammodramus savannarum	Grasshopper sparrow		SC	G5	S4	6	2008
Angelica venenosa	Hairy angelica		SC	G5	S3	5	2018
Aristida longespica	Three-awned grass		SC	G5	S2	10	2019
Asclepias hirtella	Tall green milkweed		.I	G5	S2	1	1991
Asclepias purpurascens	Purple milkweed		.I	G4 G5	S2	1	2015
Asclepias sullivantii	Sullivant's milkweed		.I	G5	S2	4	2018
Astragalus neglectus	Cooper's milk vetch		SC	G4	S3	1	2022
Battus philenor	Pipevine swallowtail		SC	G5	S2 S3	1	2015
Betula populifolia	Gray birch		SC	G5	S3	2	2001
Boechera missouriensis	Missouri rock-cress		.I	G5	S2	1	1990
Bombus affinis	Rusty-patched bumble bee	LE	E	G2	SH	1	1914
Bombus borealis	Northern amber bumble bee		SC	G4 G5	S3	1	1921

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
<i>Bombus fervidus</i>	Yellow bumble bee		SC	G3G4	S3	1	2020
<i>Bombus pensylvanicus</i>	American bumble bee		E	G3G4	S1	2	2021
<i>Bombus terricola</i>	Yellow banded bumble bee		SC	G3G4	S2S3	1	1974
<i>Buteo lineatus</i>	Red-shouldered hawk		SC	G5	S4	1	2006
<i>Calephelis muticum</i>	Swamp metalmark		E	G3	S1	1	1930
<i>Camassia scilloides</i>	Wild hyacinth		I	G5	S2	2	1918
<i>Cambarunio iris</i>	Rainbow		SC	GNR	S3	12	2019
<i>Carex trichocarpa</i>	Hairy-fruited sedge		SC	G4	S2	1	2015
<i>Castanea dentata</i>	American chestnut		E	G3	S1S2	1	1994
<i>Centronyx henslowii</i>	Henslow's sparrow		E	G4	S3	4	2007
<i>Cerastium velutinum</i>	Field Chickweed		X	G5T4?	SX	3	1913
<i>Chenopodium standleyanum</i>	Woodland goosefoot		SC	G5	SNR	2	1950
<i>Cincinnatia cincinnatiensis</i>	Campeloma spire snail		SC	G5	S3	3	Historical
<i>Cistothorus palustris</i>	Marsh wren		SC	G5	S3	4	2013
<i>Clemmys guttata</i>	Spotted turtle		I	G5	S2	2	1997
<i>Clinostomus elongatus</i>	Redside dace		E	G3G4	S2	1	2012
<i>Corispermum pallasii</i>	Pallas' bugseed		SC	G4?	SNR	1	1930
<i>Cryptotis parva</i>	Least shrew		I	G5	S1S2	1	1932
<i>Cyclonaias tuberculata</i>	Purple wartyback		I	G5	S2	26	2021
<i>Dasistoma macrophylla</i>	Mullein-foxtail		I	G4	S1	1	2009
<i>Eleocharis engelmannii</i>	Engelmann's spike rush		SC	G4G5	S2S3	1	1994
<i>Emydoidea blandingii</i>	Blanding's turtle		SC	G4	S2S3	6	2021
<i>Endodeca serpentaria</i>	Virginia snakeroot		I	G4	S2	2	2003
<i>Epioblasma perobliqua</i>	White catspaw	LE	E	G1	SH	1	1930
<i>Epioblasma rangiana</i>	Northern riffleshell	LE	E	G1	S1	21	2021
<i>Epioblasma triquetra</i>	Snuffbox	LE	E	G2G3	S1S2	7	2019
<i>Euonymus atropurpureus</i>	Wahoo		SC	G5	S3	4	2004
<i>Euphorbia commutata</i>	Tinted spurge		I	G5	S1	1	1889
<i>Euphyes dukesi</i>	Dukes' skipper		I	G3G4	S2	4	2013
<i>Falco peregrinus</i>	Peregrine falcon		I	G4	S3	5	2020
<i>Faxonius immunis</i>	Calico crayfish		SC	G5	S4	1	1968

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
<i>Fixsenia favonius ontario</i>	Northern hairstreak		SC	G5T4	S1	1	2008
<i>Flexamia reflexa</i>	Leafhopper		.I.	GNR	S1	1	2023
<i>Fraxinus profunda</i>	Pumpkin ash		.I.	G4	S2	1	2001
<i>Galearis spectabilis</i>	Showy orchis		.I.	G5	S2	6	1933
<i>Gallinula galeata</i>	Common gallinule		.I.	G5	S3	1	2007
<i>Gentianella quinquefolia</i>	Stiff gentian		.I.	G5	S2	2	1991
<i>Geum virginianum</i>	Pale avens		.I.	G5	S1S2	1	1895
<i>Haliaeetus leucocephalus</i>	Bald eagle		SC	G5	S4	16	2021
<i>Hiodon tergisus</i>	Mooneye		F	G5	S1	1	2012
<i>Hybanthus concolor</i>	Green violet		SC	G5	S3	1	1921
<i>Hybopsis amblops</i>	Bigeye chub		X	G5	SH	1	1936
<i>Hydrastis canadensis</i>	Goldenseal		.I.	G3G4	S2	5	2005
<i>Hypericum gentianoides</i>	Gentian-leaved St. John's-wort		SC	G5	S3	4	2018
<i>Ixobrychus exilis</i>	Least bittern		.I.	G4G5	S3	2	2007
<i>Jeffersonia diphylla</i>	Twinleaf		SC	G5	S3	2	1933
<i>Juncus anhelatus</i>	Large path rush		SC	GNR	SNR	3	2009
<i>Juncus brachycarpus</i>	Short-fruited rush		.I.	G4G5	S1S2	9	2015
<i>Juncus vaseyi</i>	Vasey's rush		.I.	G5	S1S2	1	1991
<i>Justicia americana</i>	Water willow		.I.	G5	S2	4	2002
<i>Lactuca floridana</i>	Woodland lettuce		.I.	G5	S2	3	2011
<i>Lampsilis fasciola</i>	Wavyrayed lampmussel		.I.	G5	S2	9	2019
<i>Lasmigona compressa</i>	Creek heelsplitter		SC	G5	S3	5	2017
<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	15	2020
<i>Lepisosteus oculatus</i>	Spotted gar		SC	G5	S2S3	1	2007
<i>Leucospora multifida</i>	Conobea		SC	G5	SNR	4	2014
<i>Liatris squarrosa</i>	Plains blazing star		X	G5	SX	1	1904
<i>Ligumia recta</i>	Black sandshell		.I.	G4G5	S1?	22	2019
<i>Limotettix elegans</i>	Elegant spikerush leafhopper		SC	GNR	SNR	1	1994
<i>Lithobates palustris</i>	Pickerel frog		SC	G5	S3S4	2	2005
<i>Lycopodiella subappressa</i>	Northern appressed clubmoss		SC	G2	S2	1	1991

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
<i>Lycopus virginicus</i>	Virginia water-horehound		SC	G5	S2	1	2003
<i>Lysimachia hybrida</i>	Swamp candles		X	G5	SX	1	1927
<i>Macrhybopsis storeriana</i>	Silver chub		I	G5	S1	3	1985
<i>Meropleon ambifusca</i>	Newman's brocade		SC	G4G5	S2S3	1	2012
<i>Mesomphix cupreus</i>	Copper button		SC	G5	S1	1	Historical
<i>Mimulus alatus</i>	Winged monkey flower		I	G5	S1	1	1916
<i>Morus rubra</i>	Red mulberry		I	G5	S2	4	2006
<i>Moxostoma carinatum</i>	River redhorse		I	G4	S2	1	1984
<i>Moxostoma duquesnei</i>	Black redhorse		SC	G5	S2	1	2017
<i>Myotis lucifugus</i>	Little brown bat		I	G3G4	S1	1	1928
<i>Myotis sodalis</i>	Indiana bat	LE	E	G2	S1	1	1865
<i>Necturus maculosus</i>	Mudpuppy		SC	G5	S3S4	2	2021
<i>Nelumbo lutea</i>	American lotus		SC	G4	S2	5	2023
<i>Neonympha mitchellii mitchellii</i>	Mitchell's satyr	LE	E	G2T2	S1	1	1931
<i>Notropis anogenus</i>	Pugnose shiner		E	G3	S1S2	2	1894
<i>Noturus miurus</i>	Brindled madtom		I	G5	S2	2	2004
<i>Noturus stigmosus</i>	Northern madtom		E	G3	S1	3	2016
<i>Nycticorax nycticorax</i>	Black-crowned night-heron		SC	G5	S3	1	2006
<i>Obliquaria reflexa</i>	Threehorn wartyback		E	G5	S1	5	2019
<i>Obovaria olivaria</i>	Hickorynut		E	G4	S1	18	2020
<i>Obovaria subrotunda</i>	Round hickorynut	LI	E	G3	S1	11	2019
<i>Opsopoeodus emiliae</i>	Pugnose minnow		E	G5	S1	4	1986
<i>Paetulunio fabalis</i>	Rayed bean	LE	E	G2	S1S2	6	2019
<i>Panax quinquefolius</i>	Ginseng		I	G3G4	S2S3	4	2008
<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	7	2020
<i>Pantherophis gloydi</i>	Eastern fox snake		I	G3	S2	14	2022
<i>Papaipema beeriana</i>	Blazing star borer		SC	G3?	S2	4	2023
<i>Papaipema sciata</i>	Culvers root borer		I	G2G3	S3	1	2022
<i>Papaipema speciosissima</i>	Regal fern borer		SC	G3G4	S2S3	1	2023
<i>Paroxya hoosieri</i>	Hoosier locust		SC	G5	S1S3	1	1913
<i>Patera pennsylvanica</i>	Proud globelet		SC	G4	SNR	2	Historical

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
<i>Penstemon pallidus</i>	Pale beard tongue		X	G5	SX	2	1939
<i>Percina copelandi</i>	Channel darter		E	G4	S1	5	1952
<i>Percina shumardi</i>	River darter		E	G5	S1	1	1941
<i>Phaseolus polystachios</i>	Wild bean		X	G5	SX	1	1896
<i>Pisidium simplex</i>	A fingernail clam		SC	G5	SNR	1	1998
<i>Platanthera leucophaea</i>	Prairie white-fringed orchid	LT	E	G2G3	S1	1	2016
<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4G5	S3	14	2019
<i>Polygala cruciata</i>	Cross-leaved milkwort		SC	G5	S3	1	1991
<i>Pomatiopsis cincinnatiensis</i>	Brown walker		SC	G4	SH	1	Historical
<i>Potamilus alatus</i>	Pink heelsplitter		SC	G5	SNR	27	2020
<i>Potentilla supina</i>	Sand cinquefoil		T	G5	SH	1	1949
<i>Prenanthes crepidinea</i>	Nodding rattlesnake-root		T	G4	SNR	1	2023
<i>Prosartes maculata</i>	Nodding mandarin		X	G4	SX	1	1922
<i>Protonotaria citrea</i>	Prothonotary warbler		SC	G5	S3	1	2006
<i>Ptychobranthus fasciolaris</i>	Kidney shell		SC	G4G5	S2	23	2019
<i>Pycnanthemum verticillatum</i>	Whorled mountain mint		SC	G5	S2	1	1973
<i>Quercus shumardii</i>	Shumard's oak		SC	G5	S2	5	2015
<i>Rallus elegans</i>	King rail		E	G4	S2	1	1986
<i>Rhexia virginica</i>	Meadow beauty		SC	G5	S3	2	1994
<i>Ruellia humilis</i>	Hairy wild petunia		T	G5	S1	1	1931
<i>Sagittaria montevidensis</i>	Arrowhead		T	G5	S1S2	3	1988
<i>Sagittunio nasutus</i>	Eastern pondmussel		E	G4	S2	28	2019
<i>Sander canadensis</i>	Sauger		E	G5	S1	3	1993
<i>Sanguisorba canadensis</i>	Canadian burnet		E	G5	S1	1	1923
<i>Scleria pauciflora</i>	Few-flowered nut rush		E	G5	S1	1	1995
<i>Scleria triglomerata</i>	Tall nut rush		SC	G5	S3	4	1994
<i>Setophaga cerulea</i>	Cerulean warbler		T	G4	S3	1	2009
<i>Setophaga citrina</i>	Hooded warbler		SC	G5	S3	1	2006
<i>Silene virginica</i>	Fire pink		E	G5	S1	2	1917
<i>Silphium laciniatum</i>	Compass plant		E	G5	S1S2	2	2002

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Occurrences in County	Last Observed in County
<i>Silphium perfoliatum</i>	Cup plant		.I.	G5	S2	12	2017
<i>Simpsonaias ambigua</i>	Salamander mussel		F.	G1G2	S1	2	1998
<i>Sistrurus catenatus</i>	Eastern massasauga	L.I.	.I.	G3	S3	1	1858
<i>Smilax herbacea</i>	Smooth carrion-flower		SC	G5	S3	1	1896
<i>Speyeria idalia</i>	Regal fritillary		X	G3?	SH	1	1931
<i>Spiranthes ovalis</i>	Lesser ladies'-tresses		SC	G5?	S1	1	2015
<i>Spiza americana</i>	Dickcissel		SC	G5	S3	2	2005
<i>Sterna forsteri</i>	Forster's tern		.I.	G5	S2	1	1985
<i>Sterna hirundo</i>	Common tern		.I.	G5	S2	6	2009
<i>Strophostyles helvula</i>	Trailing wild bean		SC	G5	S3	4	2014
<i>Stylurus laurae</i>	Laura's snaketail		SC	G4	S3	1	1933
<i>Stylurus notatus</i>	Elusive snaketail		.I.	G3	S1S2	1	2010
<i>Stylurus plagiatus</i>	Russet-tipped clubtail		F.	G5	S1	2	2015
<i>Symphyotrichum praealtum</i>	Willow aster		SC	G5	S3	1	2011
<i>Thalictrum pubescens</i>	Tall meadowrue		SC	G5	SNR	1	1931
<i>Thamnophis butleri</i>	Butler's garter snake		SC	G4	S4	3	2021
<i>Toxolasma parvum</i>	Lilliput		F.	G5	S1	10	2018
<i>Trichophorum clintonii</i>	Clinton's bulrush		SC	G4	S3	2	1994
<i>Trillium recurvatum</i>	Prairie trillium		SC	G5	S2S3	1	1905
<i>Truncilla donaciformis</i>	Fawnsfoot		F.	G5	S1	3	2008
<i>Truncilla truncata</i>	Deertoe		SC	G5	S2S3	12	2019
<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	5	2011
<i>Wisteria frutescens</i>	Wisteria		.I.	G5	S1	1	2003
<i>Zizania aquatica</i>	Wild rice		.I.	G5	S2S3	4	2014

Natural Communities

Community Name	Global Rank	State Rank	Occurrences in County	Last Observed in County
Floodplain Forest	G3?	S3	1	2003
Great Lakes Marsh	G2	S3	2	2015
Lakeplain Oak Openings	G2?	S1	2	1994
Lakeplain Wet Prairie	G2	S1	2	2009

Community Name	Global Rank	State Rank	Occurrences in County	Last Observed in County
Lakeplain Wet-mesic Prairie	G1?	S1	3	1994
Mesic Sand Prairie	G2	S1	2	1994
Mesic Southern Forest	G2G3	S3	1	1981
Wet-mesic Flatwoods	G2G3	S2	4	2015



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APPENDIX D: PUBLIC HEARING

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NOTICE OF PUBLIC HEARING

Riverview Land Preserve Leachate Treatment Plant

The City of Riverview will hold a public hearing on a proposed project plan for a Riverview Land Preserve (RLP) Leachate Treatment Plant to address PFAS and other emerging pollutants. The hearing will be held in person at 6:00 p.m. on April 25, 2024, at the following location: Riverview City Hall, Council Chambers, 14100 Civic Park Drive, Riverview, MI 48193.

The proposed project plan will detail impacts to the environment, estimated costs and associated construction costs. The proposed project plan will be available for public viewing on the [Riverview, Michigan \(cityofriverview.com\)](http://cityofriverview.com) homepage in “Public Notices” section and in person at the following locations: Riverview City Hall, 14100 Civic Park Drive, Riverview, MI 48193 and Riverview Veterans Memorial Library, 14300 Sibley Road, Riverview, MI 48193. Comments will be accepted beginning April 9, 2024. The public can comment on the project plan and ask questions. Public comment shall close on the project plan on April 25, 2024. All public comment will be considered by City of Riverview. The public may comment electronically to TreatCommentsRLP@gmail.com. Electronic comments should be directed to the Director of Solid Waste.

Comments in writing must be mailed to:

Riverview Land Preserve
Attn: Director of Solid Waste
20863 Grange Road
Riverview, MI 48193