Draft Environmental Assessment – Mexichem Fluor, Inc. Lithium Hexafluorophosphate ($LiPF_6$) Manufacturing Unit Project (DOE/EA-2236D)

Prepared by:

U.S. Department of Energy - National Energy Technology Laboratory

Pursuant to:

The Manufacturing Deployment Office in the Office of Critical Minerals and Energy Innovation Grant Opportunity - Battery Materials Processing and Battery Manufacturing (DE-FOA-0002678)

May 2026

U.S. DEPARTMENT of ENERGY

NATIONAL ENERGY TECHNOLOGY LABORATORY

This page intentionally left blank.

National Environmental Policy Act (NEPA) Compliance

Cover Sheet

Proposed Action:

Mexichem Fluor, Inc. (Mexichem) proposes to construct and operate a lithium hexafluorophosphate ($LiPF_6$) manufacturing unit at Mexichem's facility in St. Gabriel, Iberville Parish, Louisiana. The facility would produce at least 10,000 megatons (MT) of $LiPF_6$ annually. $LiPF_6$ is a crucial component in lithium-ion batteries which has been shown to have a higher efficiency and be longer lasting. DOE's proposed action is to provide $100,000,000.00 of the project's total award value of $399,155,183.00 in a cost-shared arrangement.

Type of Statement: Draft Environmental Assessment

Lead Agency: U.S. Department of Energy; National Energy Technology Laboratory

DOE Contacts:

Project Information:
Shawn George
Project Officer
U.S. Department of Energy
Manufacturing Deployment Office in the Office of Critical Minerals and Energy Innovation
1000 Independence Ave., SW
Washington, DC 20585
240-937-6560
shawn.george@hq.doe.gov (e-mail)

NEPA Information:
Stephen Witmer
NEPA Compliance Officer
U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
412-386-7589
stephen.witmer@netl.doe.gov (e-mail)

Abstract:

The proposed project would be constructed on the remaining, undeveloped portion of Mexichem's 155-acre tract of land at 4990B Ici Road in St. Gabriel, Louisiana. Mexichem is bound to the west by Olin Chlor Alkali Products (Olin), by Syngenta Crop Protection LLC (Syngenta) to the north, and undeveloped property to the south and east. The proposed buildings, parking lot, stormwater management features, and other infrastructure would cover approximately 45 acres.

The environmental analysis identified that the most notable changes to result from the proposed action would occur in the following areas: water consumption, wastewater generation, and generation of regulated wastes, with net-positive impacts to local socioeconomic conditions.

Public Participation:

This Draft Environmental Assessment (EA) is being released for public review and comment. The public is invited to provide oral, written, or e-mail comments on this Draft EA to DOE by the close of the 15-day comment period on June 12, 2026. Copies of the Draft EA are also being distributed to cognizant Federal and State agencies and Tribal Nations. Comments received by the close of the comment period will be considered in preparing a Final Environmental Assessment for the proposed Mexichem project. Comments received after the end of the comment period will be

addressed to the extent practicable. Comments should be marked "Mexichem Draft EA Comments" and include your name, address, and organization (if applicable). Individual names and addresses (including email addresses) received as part of the public comment period normally are considered part of the public record. Persons wishing to withhold names, addresses, or other identifying information from the public record must state this request prominently at the beginning of their submitted comments. DOE will honor this request to the extent allowed by law. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be included in the public record and open to public inspection in their entirety. The Draft EA is available on the National Energy Technology Laboratory (NETL) website at https://netl.doe.gov/node/6939 and the DOE NEPA EA website at https://www.energy.gov/nepa/doe-environmental-assessments. A copy of the Draft EA is also available at the East Iberville Parish Library, located at 5715 Monticello Drive St. Gabriel, LA 70776.

Page Limit Certification: DOE certifies it has considered factors mandated by NEPA, that this Draft EA represents DOE's good-faith effort to prioritize documentation of the most important considerations required by the statute within congressionally mandated page limits (and that this prioritization reflects DOE's expert judgment), and that considerations addressed briefly or left unaddressed were, in DOE's judgment, comparatively not of a substantive nature that meaningfully informed the consideration of environmental effects and the resulting decision.

Contents

Tables

Figures

Appendices

Acronyms and Abbreviations

AOI	Area of Interest
BIL	Bipartisan Infrastructure Law
BMP	Best management Practice
CAA	Clean Air Act
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DOE	Department of Energy
EA	Environmental Assessment
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FOA	Funding Opportunity Announcement
FY	Funding Year
gpd	gallons per day
IPaC	Information for Planning and Consultation
kWh	kilowatt-hour
kWh/yr	kilowatt hours per year
LOCD	Louisiana office of Cultural Development
MT	Megatons
mgd	million gallons per day
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide

NRHP	National Register of Historic Places
O_3	Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter 10 microns in diameter or less
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
ppm	parts per million
ROD	Record of Decision
SO_2	Sulfur Dioxide
SIP	State Implementation Plan
SWPPP	Stormwater Pollution Prevention Plan
tpy	tons per year
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1.0 Introduction & Purpose and Need

1.1 Introduction

This Draft Environmental Assessment (EA) was prepared by the United States Department of Energy (DOE) - National Energy Technology Laboratory (NETL) pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended, (Title 42, Section 4321 et. Seq., United States Code) and DOE's NEPA implementing procedures (updated and effective as of February 6, 2026) to evaluate the potential environmental impacts of DOE's proposed action to provide funding to Mexichem for its proposed project. The purpose of this Draft EA is to provide the information needed to assess the potential environmental and social impacts associated with the proposed project to construct a lithium hexafluorophosphate (LiPF6) manufacturing facility in St. Gabriel, Louisiana that will produce 10,000MT of LiPF6 in St. Gabriel, Louisiana.

The DOE Manufacturing Deployment Office (MDO) in the Office of Critical Minerals and Energy Innovation (CMEI) and NETL are aware that the Council on Environmental Quality (CEQ), on February 25, 2025, issued an interim final rule to remove its NEPA implementing regulations at 40 C.F.R. Parts 1500–1508. The NEPA review and EA development was initiated in 2023 - relying on the CEQ NEPA implementing regulations. Based on CEQ guidance, and to promote completion of their NEPA review in a timely manner, MDO and NETL relied on the CEQ regulations, in addition to DOE's own regulations implementing NEPA at 10 C.F.R. Part 1021, for a portion of this Draft EA to satisfy the legal requirements imposed by NEPA, 42 U.S.C. §§ 4321 *et seq*. Although this document was partially prepared under the previous guidance, updates were made where practicable to align with more recent guidance.

1.2 Background

Mexichem Fluor (Mexichem) was selected for a potential grant under the DOE Funding Opportunity Announcement (FOA) DE-FOA-0002678, titled "Battery Materials Processing and Battery Manufacturing." This FOA is managed by DOE's Manufacturing Deployment Office (MDO) in the Office of Critical Minerals and Energy Innovation (CMEI). Projects awarded under the FOA will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act (IIJA)

DOE prepared an environmental synopsis to evaluate and compare potential environmental impacts for each proposal deemed to be within the competitive range from proposals received in response to the FOA. The Department used the synopsis to evaluate appreciable differences in potential environmental impacts from those proposals. The synopsis included: (1) a brief description of background information for the area of interest, (2) a general description of the proposals DOE received in response to the DE-FOA-0002678and deemed to be within the competitive range, (3) a summary of the assessment approach DOE used in the initial environmental review to evaluate potential environmental impacts associated with the proposals, and (4) a summary of environmental impacts that focused on potential differences among the proposals.

DOE selected numerous projects under twelve topic areas of interest and provided cost-shared funding for project definition activities; all of the projects are subject to the completion of project-specific NEPA reviews. DE-FOA-0002678 supports new, retrofitted, and expanded commercial-scale domestic facilities to produce battery materials, processing, and battery recycling and manufacturing demonstrations.

The applications reviewed under this FOA were selected for negotiations in October 2022. Twelve topic areas of interest (AOIs; Table 1) were included in the FOA and each AOI outlined project objectives that were specific to that AOI. The twelve AOIs were separated according to the IIJA sections 40207(b)(3)(A) and 40207(c)(3)(A): AOIs 1–3 and 6–11 were directed to commercial level projects. AOIs 4, 5, and 12 were directed to demonstration level projects.

Table 1: Areas of Interest under DE-FOA-0002678

Areas of Interest
Battery Material Processing Grants pursuant to Section 40207(b)(3)(A)
1: Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks
2: Commercial-scale Domestic Production of Battery-Grade Graphite from Synthetic and Natural Feedstocks
3: Commercial-scale Domestic Separation and Production of Battery-grade Precursor Materials (Open Topic)
4: Demonstrations of Domestic Separation and Production of Battery-grade Materials from Unconventional Domestic Sources
5: Demonstrations of Innovative Separation Processing of Battery Materials Open Topic
Battery Component Manufacturing and Recycling Grants pursuant to Section 40207(c)(3)(A)
6: Commercial-scale Domestic Battery Cell Manufacturing
7: Commercial-scale Domestic Battery Cathode Manufacturing
8: Commercial-scale Domestic Battery Separator Manufacturing
9: Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes
10: Commercial-scale Domestic Battery Component Manufacturing Open Topic
11: Commercial-scale Domestic Battery Recycling and End-of Life Infrastructure
12: Domestic Battery Cell and Component Manufacturing Demonstration Topic

DOE selected the project proposed by Mexichem under AOI 3 of DE-FOA-0002678 to support construction of Mexichem's St. Gabriel, Louisiana facility. DOE's Proposed Action is to provide $100,000,000 of the project's total cost of $399,155,183 in a cost-shared arrangement.

1.3 Purpose and Need for Department of Energy Action

The overall purpose and need for DOE action is to accelerate the development of a resilient supply chain for high-capacity batteries by increasing investments in battery materials processing and battery manufacturing projects. IIJA investments in the battery supply chain would include five main steps including: (1) raw material production, (2) materials processing including material refinement and processing, (3) battery material/component manufacturing and cell fabrication, (4) battery pack and end use product manufacturing, and (5) battery end-of-life and recycling. DOE considers Mexichem's proposed project and location to be one that can meet the focus of IIJA sections: a) creating and retaining good-paying jobs; b) supporting workforce development efforts to strengthen America's competitive advantage; c) ensuring that the United States has a viable battery materials processing industry to supply the North American battery supply chain; d) expanding the capabilities of the United States in advanced battery manufacturing; e) enhancing national security by reducing the reliance of the United States on foreign competitors for critical materials and technologies; f) enhancing the domestic processing capacity of minerals necessary for battery materials and advanced batteries; and g) ensuring that the United States has a viable domestic manufacturing and recycling capability to support and sustain a North American battery supply chain. The Project site was selected due to its proximity to existing operations at the Mexichem facility. DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this and other projects selected under DE-FOA-0002678.

1.4 National Environmental Policy Act and Related Procedures

This EA is prepared in accordance with the National Environmental Policy Act (NEPA), as amended (42 U.S.C. 4321) and DOE's implementing procedures for compliance with NEPA (10 CFR 1021). This Draft EA allows for public input into the federal decision-making process, informs federal decision-makers of potential environmental effects of their decisions before making these decisions, and documents the NEPA process.

1.5 Agency Consultation

DOE initiated consultations with the United States Fish and Wildlife Service (USFWS) under the Endangered Species Act, and the Louisiana Office of Cultural Development under Section 106 of the National Historic Preservation Act (NHPA). Response letters are included in Appendix B.

1.6 Consultation with Tribal Nations

DOE initiated consultations with the Alabama-Coushatta Tribe of Texas, Apache Tribe of Oklahoma, Chitimacha Tribe of Louisiana, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, and Seminole Tribe of Florida through each Tribal Nation's Tribal Historic Preservation Office. Response letters, if received, are included in Appendix C.

2.0 Proposed Action and Alternatives

2.1 Department of Energy's Proposed Action

DOE proposes, through a grant awarded to Mexichem, to partially fund the construction of the $LiPF_6$ unit at the Mexichem facility in St. Gabriel, Louisiana. If approved, DOE proposes to provide $100,000,000.00 of the project's $399,155,183.00 total costs. Mexichem's private cost share would be $299,155,183.00.

2.2 Mexichem's Proposed Project

The proposed project is the construction and operation of a lithium hexafluorophosphate ($LiPF_6$) manufacturing unit at Mexichem's property in St. Gabriel, Iberville Parish, Louisiana (Figure 1) that will produce 10,000MT of $LiPF_6$ in St. Gabriel, Louisiana

Mexichem currently owns and operates a facility that manufactures hydrofluorocarbon (HC-134a), referred to as the KLEA unit, and a transloading and blending facility within its 155-acre tract of land at 4990B Ici Road in St. Gabriel, Louisiana. Mexichem is bound to the west by Olin Chlor Alkali Products (Olin), by Syngenta Crop Protection LLC (Syngenta) to the north, and undeveloped property to the south and east.

The proposed $LiPF_6$ plant would utilize existing infrastructure at the Mexichem facility to the extent that is possible. This would be accomplished by modification of the existing facility to support $LiPF_6$ production that includes increased boiler use, rail loading, and fugitive emissions. Additionally, a new cooling tower and wastewater treatment unit would be constructed to support $LiPF_6$ production. The $LiPF_6$ plant expansion would include two new detention ponds, the $LiPF_6$ unit, warehouses, an administrative building, and parking. A site map is provided as Figure 2.

The $LiPF_6$ would manufacture an electrolyte material used in lithium-ion batteries. $LiPF_6$ is produced by reacting LiF with other compounds using a proprietary process to form $LiPF_6$ and HCl. LiF as a raw material is supplied to the reaction train from an onsite storage area where solid LiF is stored; PCl_3 and HF are fed from the storage tanks and Cl_2 is supplied to the reaction train from a pipeline.

After the reaction, the $LiPF_6$ product and the HCl byproduct are separated; the $LiPF_6$ is routed through purification and drying steps to form the final $LiPF_6$ product. HCl is directed to a distillation column for purification, then stored in tanks onsite.

The $LiPF_6$ product is packaged in containers of various sizes. Hydrochloric acid (36% percent nominal strength) is shipped out in bulk by means of rail cars.

Waste gases from the manufacturing process are sent to a scrubber system to remove any acid gases.

2.3 Alternatives

DOE's alternatives to this project consist of the numerous technically acceptable applications received in response to DE-FOA-0002678. Before selection, DOE made preliminary

determinations about the level of review under NEPA based on potentially significant impacts it identified during review of technically acceptable applications. DOE conducted these preliminary reviews and prepared a synopsis for projects under the FOA.

DOE's Proposed Action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, therefore, DOE's decision is limited to either accepting or rejecting a project as proposed by the proponent, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a no-action alternative for each selected project.

2.4 No Action Alternative

Under the No Action Alternative, DOE would not provide funds to the Proposed Project. Without DOE funding, the project will not be completed as proposed. Mexichem would need to identify other funds equal to the amount of funding that would be received from DOE under the above-listed funding opportunity. If DOE would not fund the proposed action, this project schedule could be delayed while Mexichem seeks other funding opportunities. If alternative funding sources do not equal the amount provided by DOE, the proposed project may require de-scoping or additional schedule delays. Additionally, expedited domestic production of high quality and reliable $LiPF_6$ to support standalone storage, energy storage systems, and military systems could be delayed and possibly not occur if DOE would not fund this project. For the purposes of establishing an environmental baseline of current conditions and comparing that baseline to potential impacts if the Proposed Project were to proceed, the analysis of impacts assumes that the Proposed Project would not likely proceed under the No Action Alternative, and all resource areas would remain unchanged from current conditions.

2.5 Alternatives Considered by Mexichem

There were no other alternatives considered by Mexichem.

2.6 Summary of Environmental Consequences

Table 2 provides a summary of the environmental, cultural, and socioeconomic impacts of the No Action Alternative and the Proposed Project. As stated above, for the purposes of establishing an environmental baseline of current conditions and comparing that baseline to potential impacts if the Proposed Project were to proceed, the analysis of impacts assumes that the Proposed Project would not likely proceed under the No Action Alternative, and all resource areas would remain unchanged from current conditions.

Table 2. Summary of Environmental, Cultural, and Socioeconomic Impacts

Impact Area	No Action Alternative		Proposed Project	
	Construction	Operations	Construction	Operations
Community Services	None	None	None	None
Parks and Recreation	None	None	None	None

Aesthetics and Visual Resources	None	None	None	None
Land Use	None	None	None	None
Socioeconomics	None	None	Minor Beneficial	Minor Beneficial
Wetlands and Floodplains	None	None	Minor	Negligible
Surface Water and Groundwater	None	None	Minor	Moderate
Air Quality	None	None	Minor	Minor
Noise and Vibration	None	None	Negligible	Negligible
Geology, Soils, and Topography	None	None	Minor	Negligible
Cultural Resources	None	None	None	None
Vegetation and Wildlife	None	None	Minor	Negligible
Waste Management (Solid and Hazardous Wastes)	None	None	Minor	Moderate
Utilities and Energy Use	None	None	Negligible	Moderate
Transportation and Traffic	None	None	Minor	Minor
Public and Occupational Health and Safety	None	None	Negligible	Negligible

3.0 Environmental Consequences

3.1 Dismissed Resources

3.1.1 Community Services

The nearest community services to the proposed project site include Iberville Parish Fire District #1 and Acadian Ambulance Station (1.1 miles), East Iberville High School (2.6 miles), the St. Gabriel Police Department (3.7 miles), and the East Iberville Fire Department (4.4 miles). These services are generally located to the north and west of the project site. A Traffic Study was conducted for the Proposed Action and is further discussed in Section 3.11. Construction and operation of the proposed project would primarily rely on workers from local communities. As a result, the project is not anticipated to increase demand on police, fire, school, or other community services. Therefore, community services are dismissed from further analysis.

3.1.2 Parks and Recreation

The City of St. Gabriel operates six public parks; the nearest, William Street Park, is located approximately 0.6 miles south of the project site. Bayou Manchac, the nearest state park, is approximately 9.5 miles north of the site, and the Manchac Wildlife Management Area is approximately 18 miles southeast. No National Parks are located in the vicinity of the project area. The proposed project would be constructed within an existing industrial complex in an area already characterized by industrial activity. As such, the project would not alter or restrict existing recreational resources or uses in the immediate area. Therefore, parks and recreation are dismissed from further analysis.

3.1.3 Aesthetics and Visual Resources

The proposed project would be constructed within an existing industrial complex, with adjacent land uses consisting of industrial facilities and wooded areas to the north, south, and east. The scale and appearance of the project would be consistent with surrounding industrial development. Although construction activities may be visible from nearby roadways and the closest residential area, no adverse visual impacts to motorists are anticipated. The project would comply with all City of St. Gabriel zoning ordinances, including required buffers and setbacks from the nearest residences, located approximately 1,500 feet west of the site. Accordingly, the project is not expected to affect aesthetics or visual resources, and this resource area is dismissed from further analysis.

3.1.4 Land Use

According to the City of St. Gabriel Zoning Ordinance, the project site is zoned Heavy Industrial (M2). As described previously, the proposed project would be fully located within an existing industrial complex and is primarily surrounded by other industrial facilities and uses. The project is consistent with the established industrial character of the area and is not expected to require any zoning variances or amendments for construction or operation. Therefore, land use and zoning are dismissed from further analysis.

3.2 Socioeconomics

As discussed in Section 2.2**,** the proposed project would be located within the city limits of St. Gabriel. According to the 2020 Census, the populations of St. Gabriel and Iberville Parish are 6,433 and 30,241 respectively. Approximately 14.1% of St. Gabriel and 20.2% of Iberville Parish are in poverty. Since the 2010 Census, the State of Louisiana has experienced an approximate 3% population increase, whereas the City of St. Gabriel and Iberville Parish have experienced population decreases of 4% and 9%, respectively.

The city of St. Gabriel and Iberville Parish have a total civilian labor force of 40.7% and 52.6% with an unemployment rate of 6.1% and 3.9%, respectively. Unemployment for the city and parish is above the state's unemployment rate of 3.7%. The Iberville Parish labor force is predominantly employed by the educational service industry (12.3%) followed by retail trade (10.8%), manufacturing (10.5%), health care & social assistance (10.5%), and public administration (9.89%). The most common occupation in the industries established in Iberville Parish is office & administrative support (12.3%) followed by management (12%), construction & extraction (8.16%), production (7.81%), and business & financial operations (6.98%). The proposed project is anticipated to have a minor beneficial impact on local socioeconomics during the construction and operational phases.

Construction

The proposed project is estimated to create 250 construction jobs. The construction jobs are anticipated to be sourced from the city of St. Gabriel, Iberville Parish, and other surrounding communities, as well as contracting local companies to perform various activities during the construction phase. The influx of job opportunities would have a positive impact on the unemployment rate in the city of St. Gabriel and Iberville Parish. It could also provide increased tax revenue at a municipal, parish, and state level. In addition to construction jobs, secondary jobs related to the increased economic activity stimulated by the proposed project may be created, including additional retail and business employment.

Operations

Once the proposed $LiPF_6$ facility is fully operational, an estimated 80 full-time equivalent (FTE) employees and 20 nested contract personnel would be hired in addition to the 80 FTEs and 20 contract personnel employed at the existing Mexichem Flour, Inc. St. Gabriel Facility. These estimated values do not account for construction crews used for various tasks at the existing facility and proposed facility after initial construction is completed. Since 86% of the employees at existing facility live within 25 miles of the facility, there is no expected impact to the housing demand and population as a result of the proposed project. Mexichem is planning to hire a majority of the employees for the proposed project from local communities. Mexichem would continue to participate in the St. Gabriel Community Advisory Panel, East Iberville Incorporated, and LED Fast-Start Program.

3.3 Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires Federal agencies to consider the effects of their undertaking on historic properties. There are eight federally recognized tribes that have a cultural interest in projects in Iberville Parish: Alabama-Coushatta Tribe of Texas, Apache Tribe of Oklahoma, Chitimacha Tribe of Louisiana, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, and the Seminole Tribe of Florida.

The proposed project area is relatively flat and covered in mixed hardwoods and grasslands. Based on available historic topographic maps and aerial imagery from 1862 to 2024, the site has been undeveloped with uses confined to row cropping, haying, and cattle grazing. The areas surrounding the proposed project were predominantly used for row cropping and plantations until the 1930s when residential structures started to develop in the area. The next significant development in the surrounding area was the development of the industrial facilities in the 1970s. Since then, residential development has been stagnant in the surrounding area while industrial development has continued to grow.

All Phases Archaeology conducted the *2023 Phase I Cultural Resource Survey* (CRS) for the proposed action. It was noted in the 2023 Phase I CRS that there are no listed National Register of Historic Places (NRHP) properties or historic districts within a one-mile radius of the proposed facility. During the 2023 Phase I CRS for the Proposed St. Gabriel Property, All Phases Archaeology conducted 174 shovel tests consisting of 166 negative shovel tests and 8 untestable locations due to asphalt, gravel, and/or standing water. The Phase I CRS identified no cultural resources or historic properties, and no further cultural investigations were recommended by All Phases Archaeology.

According to the Louisiana Office of Cultural Development Division of Archaeology's Louisiana Cultural Resources Map, the following archeological sites, historic resources and cemeteries are present within one mile of the proposed action:

- 6 archaeological sites
    - Site 16IV133 is known as Mrs. Heath's place and is assumed to have served as a plantation or sugarhouse site in the 19th century.
    - Site 16IV221 had late 19th to early 20th century subsurface artifact scatter associated with domestic use of the property.
    - Site 16IV222 has late 19th to early 20th century artifact scatter and a small structure associated with domestic use of the property.
    - Site 16IV223 has low density late 19th to early 20th century artifact scatter associated with domestic use of the property.
    - Site 16IV223 has low density late 19th to early 20th century artifact scatter associated with domestic use of the property.
    - Site 16IV225 has two architectural features, piers from demolished structures, and low-density artifact scatter from early 20th century domestic use of the property.
- 1 historic resource

    - Historic resource #24-01161 is an industrial site that was built for a pharmaceutical company in the 1970s. The landscape consists of industrial structure and buildings with minimal open space for trees.
- 2 historic cemeteries.
    - Mount Bethel Baptist Cemetery
    - Jerusalem Baptist Cemetery

None of the previously identified sites, surveys, or resources are located within the proposed project area with the exception of 3 previous Phase I CRSs. Surveys LDOA #22-2907, #22-3187, and #22-6402 partially overlap the proposed project area. There were no cultural resources identified during all three surveys.

DOE initiated consultation with the Louisiana Office of Cultural Developments (LOCD) Division of Historic Preservation on April 14th, 2025, and initiated tribal consultation with the Alabama-Coushatta Tribe of Texas, Apache Tribe of Oklahoma, Chitimacha Tribe of Louisiana, Coushatta Tribe of Louisiana, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, Muscogee (Creek) Nation, and the Seminole Tribe of Florida in April 2025.

On May 8th, 2025, LCOD determined that the proposed project would have no effect on properties listed in or eligible for listing in the NRHP, and that no future coordination would be required with LCOD unless the proposed project changes or if archaeological remains are discovered during the course of the proposed project (Appendix B).

The Alabama-Coushatta Tribe of Texas responded on May 19th, 2025, that the Tribe has no comments on the proposed project, but noted that if the project were to change in any way or if items of cultural significance are discovered during the project, the Tribe's Historic Preservation Office should be further consulted (Appendix C). Mexichem and DOE will adhere to these stipulations.

Based on the results of the Phase I Cultural Resources Survey, and comments received to date from LCOD and the Alabama-Coushatta Tribe of Texas, DOE's Proposed Action and Mexichem's Proposed Project would have no effects on cultural resources within and near the project area. Copies of this Draft EA have been submitted to LCOD, along with THPOs and Tribal leaders of the eight tribal nations noted above for review and comment.

Mitigation Measures

If cultural artifacts and/or human remains are discovered during the development of the proposed facility, all work would cease. In addition to work stopping, DOE, LCOD, and the previously mentioned federally recognized tribes will be notified of the findings and further consultation would occur.

3.4 Wetlands and Floodplains

Executive Order 11990 was established to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Executive Order 11988 was established to avoid to the extent possible the long - and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

The proposed action area is approximately 45 acres that is primarily undeveloped forested land. Approximately 0.16 acres of Palustrine Emergent Wetlands (PEM) and 1.9 acres of Palustrine Forested (PFO) wetlands are present near the southern border and within the western corner of the proposed project area. Surface water flows to the Iberville Drainage Lateral that feeds the wetlands. Location of wetlands and surface flow pattern is shown on Figure 3. Several site layout options were evaluated; however, the current configuration is the only alternative that meets the project's purpose and need while remaining within property currently owned by Mexichem and minimizing potential impacts to wetlands and floodplains.

According to the FEMA FIRM Panel 22047C0355D (effective 11/6/2013), approximately 40.5 acres of the proposed project is in Flood Zone X, area with reduced flood risk due to levee, and the other 4.5 acres are in a Special Flood Hazard Area - Flood Zone A without a base flood elevation (BFE) (Figure 4). The new facility would be constructed within the Flood Zone X. The proposed project is anticipated to have a minor impact to wetlands and floodplains during the construction phase and a negligible impact during operations.

Construction

Although the facility was sited to comply with EO 11990 to avoid impacts to the wetlands to the extent possible, the proposed action is expected to impact approximately 0.25 acres of Palustrine Forested (PFO) wetlands and approximately 4,613 linear feet of jurisdictional Waters of the U.S. (WOUS). Mexichem applied for a Section 404 permit (MVN-2022-00332-CR) on July 24, 2025, and approval is pending.

The Iberville Parish Floodplain Administrator was contacted to issue a BFE for the proposed project and returned an official letter from the USACE, on October 18, 2023, stating the BFE for the Flood Zone A within the proposed project boundary is 17 feet. The letter from the USACE is provided in Appendix D. According to the Iberville Parish Council Code of Ordinances Section 7.5, the lowest floor (including basement) of a structure shall be elevated one foot above the base flood elevation. The $LiPF_6$ unit would be constructed with a base elevation equal or higher than 18 feet.

Operations

Operations are not anticipated to affect wetlands or the floodplain. With the facility elevated above the Base Flood Elevation (BFE), the risk of flooding during a 100-year storm event is effectively mitigated. Furthermore, the project is designed to ensure no offsite drainage impacts.

Mitigation Measures

During construction, best management practices (BMPs), including the use of silt fencing, will be implemented around nonimpacted wetlands to protect these sensitive areas. Given the design of the facility, mitigation measures are not anticipated to be necessary during operations. As part of the Section 404 permit, Mexichem purchased 0.5 acres of wetland mitigation credits at the Morgan

Branch Mitigation bank owned by Resource Environmental Solutions to compensate for the unavoidable impacts to the 0.25 acres of PFO wetlands. The letter confirming the purchase of mitigation credits, dated April 1, 2026, is included in Appendix D.

Floodplain and Wetlands Assessment, and Statement of Findings

DOE has determined that a portion of Mexichem's proposed project would be located within a base 100-year floodplain. As described above, 4.5 acres would be in a Special Flood Hazard Area. Although the facility was sited to comply with EO 11990 to avoid impacts to the wetlands to the extent possible, the proposed project would also occur within 0.25 acres of Palustrine Forested wetlands. These areas would be developed with detention ponds as part of Mexichem's overall project. Appendices B and D contain maps that show the area of potential effect and its location relative to the impacted floodplain and wetlands. Mexichem has been in contact with the U.S. Army Corps of Engineers and its local FEMA floodplain administrators regarding the proposed project. As described above, Mexichem received a Section 404 permit (MVN-2022-00332-CR), and approval is pending. The Iberville Parish Floodplain Administrator was contacted to issue a BFE for the proposed project and returned an official letter from the USACE on October 18, 2023, stating the BFE for the Flood Zone A within the proposed project boundary is 17 feet. The letter from the USACE is provided in Appendix D. According to the Iberville Parish Council Code of Ordinances Section 7.5, the lowest floor (including basement) of a structure shall be elevated one foot above the base flood elevation. The $LiPF_6$ unit would be constructed with a base elevation equal or higher than 18 feet.

DOE's alternatives to this project consist of the numerous technically acceptable applications received in response to DE-FOA-0002678 and the No Action Alternative. Mexichem's project was selected based on the reasons described in Chapter 2. Due to the proximity of DOE's proposed action and Mexichem's proposed project to Mexichem's existing facility, no other practical alternative sites exist or were considered by Mexichem. DOE's statement of findings is that a small portion of floodplains and wetlands would be directly impacted by Mexichem's proposed project and DOE's proposed action. However, due to design elements incorporated by Mexichem, impact minimization measures, wetland mitigation credits purchased, and permits issued by the U.S. Army Corps of Engineers and Iberville Parish Floodplain Administrator, the impacts to wetlands and floodplains are expected to be minor.

3.5 Surface Water and Groundwater

The proposed project site is located approximately 2,133 feet from the Mississippi River in Iberville Parish, Louisiana. The Mississippi River is the nearest major water body to the proposed project. Immediately south of the project area is a drainage canal that flows northeast, generally parallel to Bayou Braud, until their confluence approximately 1 mile northeast of the site. From this point, surface waters continue through interconnected bayous and drainage channels before ultimately contributing to the larger Amite River watershed.

The primary freshwater aquifer underlying the parish is the Mississippi River Alluvial Aquifer (MRAA), which is typically encountered at depths ranging from approximately 75 to 120 feet below ground surface. This aquifer is not considered to be a Sole Source aquifer because it does not provide at least 50% of any specific area's drinking water (USGS). According to the U.S. Geological Survey, there are currently 403 active water wells screened in the MRAA within Iberville Parish, 34 of which are used for public supply. Approximately 27 million gallons of water per day are withdrawn from the MRAA with industry being the primary user.

The City of St. Gabriel derives the majority of its public water supply from groundwater sources, including the Chicot and Jasper Equivalent Aquifer Systems, with an estimated withdrawal of approximately 1.38 million gallons per day (MGD). This supply is supplemented with an additional 0.58 MGD of treated surface water from the Mississippi River. Annual precipitation in Iberville Parish averages between 50 and 70 inches, increasing from north to southeast, consistent with the regional humid subtropical climate. Mexichem currently has two water wells with depths of 180 and 186-feet that pull from the Mississippi River Alluvial Aquifer for its process water. Potable water for the facility comes from the Iberville Parish Municipal water system.

Surface Water

Construction

Construction of the proposed project would have minor and temporary impacts on surface waters from sheet flow from the construction site during rain events. Potential impacts to surface waters from direct run-off would be minimized through the implementation of a Construction Stormwater Pollution Prevention Plan (SWPPP) and BMPs as required under the Louisiana Pollutant Discharge Elimination System (LPDES) Construction Stormwater Permit LAR100000 for stormwater discharges associated with a project footprint of five acres or more. A Water Quality Certification (WQC) was issued by LDEQ on December 9, 2025. A WQC satisfies Section 401 of the Clean Water Act. The WQC is included in Appendix B.

Operation

A Drainage Impact Study (Appendix D) was conducted to optimize site drainage and stormwater storage capacity. The study identified the need for two detention ponds to be constructed to contain stormwater. Pond A1, would be located on the southwest border of the proposed project area. Pond A1 would be approximately 8.8 acres in size with a depth of 6.5-feet. This pond would have a capacity of over 18 million gallons. Pond A2 would be located on the southernmost part of the project area and would be approximately 1.1 acres with a depth of 7-feet. This pond would have a capacity of 2.5 million gallons. Pond A1 would outfall into an existing drainage ditch that flows towards the Iberville Parish Drainage Lateral located to the south of the proposed project area. Pond A2 would outfall directly into the Drainage Lateral. From the Drainage Lateral, water flows east towards Bayou Braud, then flows north into Bayou Paul. For a detailed drainage map, see Figure 3.

The proposed ponds would limit the outfall location's post-developed flow rate (based on the 100-year storm event) to less than or equal to the pre-developed flow rate (based on the 10-year storm event) through the use of the outfall pipes being used as control structures. As described in Section

2.2, the $LiPF_6$ plant will require approximately 119,520 gallons per day (gpd) of water for its process operations and 4,725 gpd for potable water. The $LiPF_6$ plant would cause the facility as a whole to increase its process and potable water by 30 and 112% respectively. Water for process operations would come from existing water wells that are discussed below and from Olin, a neighboring facility. Consumption of raw water is estimated to increase by 67% from 2023 use rates. Potable water would come from a new tie into the Iberville Parish municipal water system. Mexichem would obtain a permit from Iberville Parish prior to starting work on the municipal water tie-in. Approximately 131,040 gpd of process wastewater and sanitary wastewater would be treated onsite and then discharged through Olin's outfall into the Mississippi River. This would result in an increase in wastewater discharge of approximately 69% t from the 2023 use rates for the existing facility.

Groundwater

Construction

There are no anticipated impacts to groundwater during construction.

Operations

Operations of the $LiPF_6$ unit would require only a 0.88% increase in demand on the Mississippi River Alluvial Aquifer (MRAA), representing a minor addition relative to the aquifer's overall capacity. According to the U.S. Geological Survey, groundwater recharge to the MRAA is estimated at approximately 2.6 inches per year, which provides a continuous natural replenishment of the aquifer system. Given this recharge rate, the incremental withdrawal associated with the proposed operations is not expected to measurably affect aquifer levels or regional groundwater availability. Furthermore, the projected demand remains well within sustainable use thresholds and does not pose a risk of depleting groundwater storage or adversely impacting other permitted users. Routine monitoring of groundwater withdrawal and compliance with state and federal water management regulations would ensure that operations remain within allowable limits. Based on these factors, the impact of $LiPF_6$ operations on the MRAA is considered negligible under current regulatory and hydrologic conditions.

Mitigation Measures

Construction

As previously mentioned, BMPs such as a silt fence would be installed around the construction area to prevent sediment and debris from washing offsite to nearby surface waters. There are no anticipated mitigation measures for groundwater during construction.

Operations

Surface water impacts would be mitigated through the use of detention ponds. Mitigation is not anticipated for discharge of treated process wastewater to the Mississippi River. Increases in discharge are expected to be negligible to the volume of the Mississippi River. The proposed project is anticipated to have moderate impacts to surface and groundwater resources during construction and operation.

3.5 Vegetation and Wildlife

Based on historical aerial imagery, the proposed project area has been utilized for row cropping, cattle grazing, and haying from the 1930s until the late 1970s. From the late 1970s to present the proposed project area has consisted of forested land. The typical vegetation in open land (cropping, grazing, and haying) and woodland (forest) habitats in Iberville Parish include grain/seed crops (e.g., wheat, millet, cowpeas, and sunflowers), grasses/legumes (e.g., fescue, ryegrass, clover, and vetch), wild herbaceous plants (e.g., bluestem, switchgrass, panicum grasses, and paspalum grasses), and hardwoods (e.g., oak, sweetgum, dogwood, and water hickory). The majority of the project area that would be developed consists of forested habitat. A U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) was completed to identify any potential habitats within the proposed project area for threatened and/or endangered species as well as migratory birds and bald/golden eagles. The IPaC revealed one proposed endangered species - Tricolored Bat (*Perimyotis subflavus*) and two proposed threatened species - Alligator Snapping Turtle (*Macrochelys Temminckii*) and Monarch Butterfly (*Danaus Plexippus*). The IPaC listed that there are no critical habitats for these species within the proposed project area. The IPaC Species List is provided in Appendix B.

A Determination Key was completed for the Tricolored Bat. A Determination Key is a structured questionnaire on the IPaC website that assists users in determining whether a project qualifies for a predetermined consultation outcome based on USFWS standing analysis. The proposed project received a determination of "May Effect" for the Tricolored Bat due to tree clearing and potential for an increase in artificial lighting. The Determination Key is provided in Appendix B. DOE's consultation with the USFWS regarding Mexichem's Proposed Project, the "May Effect" determination, and proposed conservation measures are described in the "Construction" and "Mitigation Measures" sections below.

Construction

The construction of the proposed facility would convert approximately 40 acres of woodland habitat to industrial setting. The woodland habitat is approximately 50 years old with minimal impacts from development or agricultural practices. Given this information, the proposed facility was strategically located to avoid woodland and wetland habitats whenever possible as well as using BMPs such as mulching, vegetation, and dust control to prevent soil erosion in construction and non-construction areas. As previously stated, the IPaC conducted for the proposed project did not identify any critical habitats for threatened or endangered species. The IPaC did identify seven migratory birds with breeding seasons near the proposed facility. For the migratory species listed, the probability of presence is most likely to occur in April, with breeding season varying for each species. The woodland habitats within and surrounding the proposed project area have the potential to provide habitat to migratory birds, but best management practices (BMPs) can be utilized during construction and operations to avoid or minimize impacts to migratory birds.

Although no critical habits have been identified within the proposed project area, Mexichem assumes that the 40 acres of woodlands habitat is suitable habitat for the Tricolored bat due to canopy density and tree maturity. To decrease potential impacts to the Tricolored Bat, tree clearing would not take place during pup season. Pup season in Louisiana takes place from May 1 to July

15. Additionally, any required lighting that is within 1,000 feet of suitable habitat (forested areas) and has the potential to increase ambient light levels would be downward facing, full cut-off lens lights. These lights decrease ambient light exposure outside of the lit area and are the recommended mitigation for the Tricolored Bat by USFWS. While the potential habitat for migratory birds would be minimally impacted during construction, BMPs such as avoiding or limiting construction during breeding seasons, implementing a daytime construction schedule to avoid excessive noise and artificial lighting during the night, minimizing construction runoff to adjacent woodland/wetland habitats, and coordinating with DOE, USFWS and/or Louisiana Department of Wildlife and Fisheries (LDWF) if a nest is found during construction would be followed.

Operation

The operation of the proposed facility is not anticipated to impact vegetation and wildlife.

Mitigation Measures/Consultation with USFWS

As discussed above, DOE initiated informal consultation via email with the USFWS – Louisiana Ecological Services Field Office regarding its Proposed Action, Mexichem's Proposed Project, and the "May Effect" determination for the Tricolored bat on February 5, 2026. Representatives from DOE, Mexichem, CSRS, and the USFWS also met on February 19, 2026, to discuss Mexichem's Proposed Project and proposed conservation measures based on the "May Effect" determination for the Tricolored bat. In particular (and as discussed above) – it is assumed that the 40 acres of woodland habitat to be converted to industrial use from Mexichem's Proposed Project is suitable habitat for the Tricolored bat. However, Mexichem has proposed (and would adhere) to two conservation measures for the Tricolored bat. The first conservation measure is time of year restrictions on tree clearing. No tree clearing would take place during pup season (May 1 – July 15). Additionally, any required lighting that is within 1,000 feet of suitable habitat (forested areas) and has the potential to increase ambient light levels would be downward facing, full cut-off lens lights. These lights decrease ambient light exposure outside of the lit area and are the recommended mitigation for the Tricolored bat by USFWS. Full details of the proposed conservation measures can be found in Appendix B. DOE submitted these conservation measures to the Louisiana Ecological Services Field Office on April 10, 2026, for review and approval. The Louisiana Ecological Services Field Office responded that the proposed conservation measures would justify a "not likely to adversely effect" determination for the Tricolored Bat on May 5, 2026. USFWS consultation documents are provided in Appendix B. DOE's initial determination of effect is that the Proposed Action and Mexichem's Proposed project is Not Likely to Adversely Affect the Tricolored bat, Alligator snapping turtle, or Monarch butterfly. DOE has submitted a copy of this Draft EA to the Louisiana Ecological Services Field Office for review and comment on this determination and the Draft EA as a whole.

3.6 Air Quality

The Clean Air Act (CAA) establishes the framework for national, state, and local efforts to protect air quality in the United States (42 USC 7401-7642) Through the CAA, the USEPA has developed a set of standards known as the National Ambient Air Quality Standards (NAAQS) for six criteria

air pollutants. Those pollutants are as follows: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), sulfur dioxide (SO2), lead (Pb), and particulate matter (PM10 and PM2.5). In 2016, LDEQ issued a request to amend to the five parish State Implementation Plan (SIP) to redesignate it from a non-attainment zone to an attainment (maintenance) zone. The request was approved in 2017. Included in the SIP, there are specific emission thresholds for the seven criteria air pollutants as seen in Table 1.

Table 3: Emission thresholds for parishes within the SIP zone

Pollutant	Threshold Value (tons/year)
Carbon Monoxide (CO)	100
Lead (Pb)	25
PM_{10} or $PM_{2.5}$	100
SO_2	100
NO_X	100
VOC	100

Affected Environment

Iberville Parish, Louisiana was designated as a Marginal Maintenance zone for the Ozone 8-hr 2008 standard in 2017. The parish is in attainment for all other NAAQs according to the EPA Green Book. The proposed plant would require a minor source air permit and is not anticipated to change the regional criteria pollutant maintenance status.

As discussed in Section 2.2, Mexichem currently operates the Klea facility under Minor Source air permit No. 1280-00040-10 issued on August 19, 2021. Table 3 below provides the permitted emissions of regulated pollutants for current operations at the Mexichem facility in tons per year (tpy). The proposed project is anticipated to have minor impacts on air quality during construction and operations.

Table 4: Current Operations Emissions

Pollutant	Permitted Emissions for Current Operations (tpy)
PM_{10}	3.63
$PM_{2.5}$	3.63
SO_2	0.43
NO_x	22.90
CO	41.04
VOC	14.01

Note: Data obtained from Mexichem's Minor Source Air permit application

Construction

In addition to tailpipe emissions from heavy equipment, ground surface disturbances during excavation, and grading activities could potentially generate fugitive dust. Fugitive dust can affect both air quality and public health. Construction personnel would implement mitigation measures such as applying water to exposed surfaces, adding vegetation or mulching in non-construction

areas, and applying water to roads on a as needed basis to mitigate fugitive emissions from dust. Construction work areas would be managed through housekeeping and regular daily clean up from construction operations to minimize dust and dust particles from becoming airborne. DOE expects the overall impacts from fugitive dust emissions would be temporary in duration and of minor intensity.

Construction of the proposed project would result in a temporary increase in emissions from sources such as vehicle transportation of equipment and materials, use of construction machinery, and welding. Use of electricity above the baseline may indirectly increase emissions depending on electric generation sources and methods employed by local utilities serving the site.

A conformity analysis was performed to determine if emissions from the construction phase of the proposed project would be under the *de minimis* thresholds set by the SIP. NOx and VOCs can react with each other and CO to produce ground level ozone. Thus, NOx and VOCs were the two critical criteria pollutants analyzed in the conformity analysis. The summary of the analysis shown in Table 5 below demonstrates that the construction phase of the project would be under the 100 tpy thresholds set by the SIP. For the full conformity analysis, see Appendix E.

Table 5: Summary of Emissions during Construction Phase

Equipment	HorsePower (HP)	Run Time (Hr/Wk)	Wk/ Year	Number of	NOx	VOC
Bull Dozer	165	20	24	2	103.945	49.477
Excavators	200	20	24	3	188.99	89.957
Tree Cutters	200	20	12	2	62.996	29.986
Tree Chipper	350	20	12	1	55.122	26.238
Dump Trucks	500	20	24	15	2362.38	1124.468
Skid Steers	100	16.7	52	4	227.943	108.499
Pile drivers (Crane)	200	20	16	2	83.996	39.981
Concrete Trucks	480	5.6	24	10	423.338	201.505
Forklift	200	20	52	4	545.972	259.877
Crawler Cranes	200	22.5	48	5	708.713	337.340
Cherry Picker	200	20	52	4	545.972	259.877
SPMT	300	20	24	8	755.961	359.830
Manlifts	70	22.5	52	6	322.464	153.490
Diesel Hammer	50	20	16	2	196.318	50.934
Diesel Welder	40	20	52	6	1531.278	397.284
Light Plants	25	20	52	12	1914.097	496.605
Generators	25	20	52	4	638.032	165.535
UTVs	25	20	52	12	1914.097	496.605
Pickup Trucks*	400	20	52	6	13.653	3.542
				lbs/year	**12,595.26**	**4,651.03**
				tons/year	**6.30**	**2.33**
				total (tons/ year)		**8.62**

Operations

Mexichem applied to modify its minor source air permit to include the $LiPF_6$ facility on June 30, 2025. The permit modification request was approved on December 18, 2025. Table 6 below provides the permitted emissions of regulated pollutants for current and future $LiPF_6$ operations at the Mexichem facility. It is anticipated that a long-term, minor increase in overall emissions would result from the proposed project.

Table 6: Anticipated Emissions for Operations

Pollutant	Permitted Emissions for Current Operations (tpy)	Anticipated Emissions for Future Operations (tpy)
PM_{10}	3.63	3.89
$PM_{2.5}$	3.63	4.06
SO_2	0.43	0.45
NO_x	22.90	24.7
CO	41.04	44.69
VOC	14.01	12.5

Under the EPA's GHG Reporting Rule (40 CFR part 98), facilities that produce more than 25,000 metric tons of carbon dioxide equivalent (CO_2e) are required to report GHG emissions. Mexichem emits more than 25,000 metric tons of CO_2e on an annual basis and has been a required reporter since 2009. Mexichem's estimated CO_2e emissions including CO_2 in reporting year 2024 were 37,503.58 metric tons, a 26% decrease from reporting year 2023 emissions. With the addition of the LiPF6 unit there would be a minimal increase in CO_2e emissions since there will be no new fired process equipment.

Raw materials would be separated and purified within the unit process. Waste gases from the manufacturing process are sent to a scrubber system to remove any acid gases. Acidic wastewater streams are neutralized in a central wastewater treatment system. In addition to the six criteria pollutants listed in Table 6, the Mexichem facility emits minor amount of hazardous air pollutants/toxic air pollutants (HAPS/TAPS).

Mitigation Measures

During Construction, typical mitigation measures to minimize air quality issues caused by fugitive dust and tailpipe emissions would include the following:

- Require all construction crews and contractors to comply with state regulations for fugitive dust control during construction.
- Maintain the engines of construction equipment according to manufacturers' specifications.

- Minimize the idling of equipment while the equipment is not in use.
- Implement reasonable measures, such as applying water to exposed surfaces or stockpiles of dirt, when windy or dry conditions promote problematic fugitive dust emissions.

For operations the $LiPF_6$ facility will be required to meet the conditions set by the minor source air permit.

3.7 Noise and Vibration

The proposed project site is situated within two miles of three major Louisiana State Highways: LA 75, LA 74, and LA 30. The state highways in addition to the Canadian National Railroad immediately north of the proposed project contribute to existing noise and vibration levels. The nearest sensitive community receptor is a residential area approximately 0.3 miles southwest of the proposed facility, while additional sensitive receptors, including a high school, church, and residential communities, are located approximately two miles north.

Construction

According to the U.S. Department of Transportation – Federal Highway Administration, the average construction noise level at 50 feet from the source is 85 dBA, while construction-related vibration levels average 0.27 in/sec. Using this information, the anticipated noise level at the southwest and southeast borders of the property was calculated using the inverse square law to be approximately 59 dBA. Pile driving activities were estimated to be at least 1,000 feet away from the perimeter of the site. The location of construction is a sufficient distance from the nearest sensitive receptor. Noise and vibration impacts are anticipated to be negligible to offsite receptors.

Construction activities would last approximately 31 months. For onsite receptors (i.e. construction workers), noise mitigation strategies would be implemented to reduce noise impact. These mitigation strategies include the use of noise-reducing equipment attachments (i.e. mufflers, silencers, etc) and PPE for workers to comply with OSHA noise exposure standards. The construction workforce would consist of approximately 280 employees, though not all will be on-site simultaneously. Traffic would vary throughout construction, with:

- First nine months: 35 to 40 vehicles/day
- Final twenty-three months: 100 to 200 vehicles/day

Given that construction workers would be sourced locally and regionally, traffic-related noise and vibration would be consistent with existing conditions in Iberville Parish and the City of St. Gabriel.

Operation

During operation, noise and vibration levels are expected to align with those of the existing facility and surrounding industrial operations. The facility would be required to comply with OSHA noise and vibration standards to ensure worker safety. Traffic-related noise impacts during operation are expected to be less than those during construction, though they would be long-term.

According to the City of St. Gabriel Comprehensive Zoning Ordinance Section 18.01, industrial properties must adhere to a maximum permissible sound level of 65 dBA at Zone Boundary and a maximum vibration level ranging from 0.05 in/sec (lot line) to 0.10 in/sec (zone boundary). A noise study was completed for the existing facility in 2018. According to the noise contour map included in Appendix F, the noise levels along the Mexichem site boundary caused by unit operations range from 57 to 61.8 db. A high noise source located near the site boundary emits noise at approximately 89.2 dB, however, noise from this source is blocked from offsite attenuation by office buildings. The Zone Boundary between the M2 industrial area and the nearest residential area is approximately 0.35 miles southwest of the proposed project. Operational noise levels are currently below 65 dB at the site boundary. Operational noise levels are expected to be less than 65 dB at the Zone Boundary.

Mitigation Measures

During operations, the facility would comply with the noise limits set by the City of St. Gabriel Zoning Ordinance Section 18.01. Koura's Safety, Health, and Environmental Policy document requires that all employees must wear hearing protection when necessary to comply with OSHA regulations.

3.8 Geology, Topography, and Soils

The Project site is located to the east of the Mississippi River and located within the Lower Mississippi alluvial valley. (USGS). The surface geology is characterized by Holocene alluvial deposits, primarily consisting of unconsolidated sediments such as gravelly sand, sandy mud, silt, and clay. These materials have been deposited over time through the river's natural levee formation and overbank flooding events. The lithology of St. Gabriel reflects a landscape shaped by fluvial dynamics, with sediment composition varying from coarse gravelly sands to fine silts and clays, depending on the depositional environment. The region has a distinctive low-lying topography with much of the terrain being flat, with subtle elevation changes that define natural levees along the riverbanks, gradually sloping into backswamps and wetlands further inland.

The proposed project site contains three soil types as listed below:

- Cl, Commerce silt loam, 0 to 1% slopes, 17.2% of site
- Cm, Commerce silty clay loam, 63.1% of site
- Sg, Sharkey clay, 0 to 1% slopes, rarely flooded, deltaic plain, 19.7% percent of site

The intent of the Farmland Protection Act (FPPA) 7 CFR Part 658 is to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. According to the U.S. Department of Agriculture's (USDA) Web Soil Survey tool, the entire project footprint is considered prime farmland. Approximately 40 acres of prime farmland soils would be permanently impacted. However, the proposed project would not be subject to the Farmland Protection Policy Act, as the project area is within the St. Gabriel City limits, not currently used for farming, in close proximity to other industrial buildings and urbanized

areas, and zoned for Heavy Industrial. Thus, impacts are considered minor as zoning prevents the land from being used for agricultural purposes.

There are no active and producing oil wells in the immediate vicinity of the proposed project. The nearest active and producing gas well is approximately 2.25 miles to the northeast of the site. (LDNR, 2025) The nearest mineral resource location is the Geismar Phosphorus processing plant approximately 3.31 miles from the site. The facility produces phosphoric acid and manufactures nitrogen solutions, phosphate fertilizer and other industrial products.

There are no records of earthquakes occurring in Iberville Parish. The nearest historic earthquake was in 2005 in the town of French Settlement (35.6 miles away). USGS Earthquake Catalog states that the earthquake had a magnitude of 3. The proposed project is located in seismic zone 0, the lowest seismic risk zone defined by the Uniform Building Code, which has no additional enforceable earthquake safety requirements for structural design. Seismic activity in this region is negligible and would be adequately addressed through compliance with local building codes.

The proposed project is anticipated to have minor impacts to geology, topography, and soils during construction and a negligible impact during operations.

Construction

Construction will involve the installation of approximately 300 to 350 piles, with depths ranging from 80 to 110 feet. A Geotechnical Report prepared by Eustis Engineering in 2024 recommends the use of square precast concrete (SPC) piles installed with a diesel hammer.

Pile installation may extend through the confining clay layer of the Mississippi River Alluvial Aquifer (MRAA), which occurs at depths of approximately 75 to 100 feet below ground surface in Iberville Parish. The MRAA is not designated as a sole source aquifer. During driving, friction between the piles and surrounding soils is expected to result in soil displacement and compaction around the pile shafts, thereby limiting the potential for vertical migration along the pile-soil interface.

Overall, impacts to site geology are anticipated to be negligible. The proposed construction activities would not alter the regional geologic framework.

Operations

As previously discussed in Section 3.5, operation of the $LiPF_6$ unit is projected to result in a marginal 0.3% increase in demand on the MRAA. Site operations are anticipated to have negligible impacts on underlying geologic formations and no adverse effects on soil resources.

Mitigation Measures

No mitigation measures are anticipated for geology, topography, and soils.

3.9 Waste Management

Affected Environment

Mexichem's existing facility is classified as a Large Quantity Generator (LQG) of hazardous waste. In accordance with LAC 33:V, Chapter 41, LQGs are required to submit annual hazardous waste reports to the Louisiana Department of Environmental Quality (LDEQ). These reports identify the types and quantities of hazardous waste generated on site and document the methods of offsite transportation and management.

According to Mexichem's most recent Annual Hazardous Waste Report, hazardous wastes generated in 2024 included waste calcium oxide, trichloroethylene (TCE), and contaminated absorbents. A total of 14.8 tons of hazardous waste was generated at the facility during the reporting year. All hazardous waste is accumulated in accordance with applicable regulations and transported off site by licensed contractors for treatment, disposal, or recycling at permitted facilities.

The proposed project is anticipated to result in minor impacts to waste management during the construction phase, primarily associated with construction-related debris and limited hazardous materials. During operations, impacts to waste management are expected to be moderate due to the projected increase in waste generation, which will continue to be managed in compliance with applicable state and federal regulations.

Construction

Solid and sanitary waste generated during construction activities would be limited to common construction-related waste streams and sanitary waste. Typical solid waste may include scrap lumber, concrete debris, packaging materials, metal fragments, and general refuse associated with construction operations. All construction-related waste would be managed in accordance with applicable federal, state, and local regulations, and best management practices (BMPs) will be employed to minimize waste generation and encourage recycling where feasible. Construction waste would be segregated by type and transported to approved disposal or recycling facilities, including landfills permitted to receive such waste streams. Mexichem estimates the following volumes of waste, in cubic yards (cy), to be generated during the construction phase:

- Clearing and grubbing: 120 cy
- Pile driving: 90 cy
- Heavy Construction: 920 cy

Sanitary waste would be managed through licensed third-party vendors, which would provide portable toilet facilities throughout the construction site. These vendors would conduct routine servicing, collection, and off-site disposal of sanitary waste at appropriately permitted facilities to ensure compliance with health and environmental standards. Waste collection activities, transport, and disposal would be documented through manifests and logs maintained for the duration of the construction period.

In addition, construction contractors would be required to follow site-specific waste management plans to ensure accountability and compliance. Routine inspections would be conducted to verify proper waste handling, segregation, labeling, and storage practices, and corrective actions would be implemented as necessary. All waste management activities would be recorded and summarized in project compliance reports to demonstrate adherence to regulatory requirements and to provide transparency to oversight agencies.

Operations

The proposed operations at the facility would involve the use, storage, and management of several hazardous and toxic materials, including hydrogen chloride (HCl), phosphorus trichloride (PCl_3), chlorine gas (Cl_2), hydrofluoric acid (HF), elemental phosphorus (P), phosphorus pentafluoride (PF_5), lithium fluoride (LiF), and lithium hexafluorophosphate ($LiPF_6$). Operations are expected to include moderate impacts from regulated wastes. The volume of universal and hazardous materials accepted by the facility each year will see an increase of 35 to 40% t under the proposed project.

Hydrofluoric acid (HF), hydrogen chloride (HCl), and phosphorus trichloride (PCl_3) would be transported to the facility via the on-site railway system, which is already in use and capable of accommodating such shipments. Based on current operations, Mexichem anticipates receiving three railcars per week of PCl_3, three additional railcars per week of HF, and four additional rail cars per week of HCl. These estimates are subject to change based on railcar size. Chlorine gas (Cl_2) would be supplied through a pipeline tie-in to an existing line, minimizing overland transport risks. Lithium fluoride (LiF) would be delivered to the site by truck in sea cans and stored in supersacks or other specialized containers appropriate for reactive solids. Mexichem anticipates receiving four truck deliveries a week to maintain continuous operations. Phosphorus pentafluoride (PF_5), due to its volatility and reactivity, would be stored separately from other chemicals in a designated warehouse located on the northern border of the project area.

Table 7: Summary of Incoming Chemicals for the $LiPF_6$

Chemical	Tons per year	Tons per day
HF	9,300	25.48
PCl3	9,600	26.30
Cl2	4,900	13.42
LiF	2,176	5.96

The key component produced on-site, lithium hexafluorophosphate ($LiPF_6$), would result in the generation of a solid hazardous waste byproduct. This waste would be in a solid phase (crystalline or powder). It would be removed from the process system as part of regular maintenance cleanouts of unit operations which will take place approximately every nine to ten days. This waste product would cause an estimated increase of 38 tpy of hazardous waste to be shipped offsite to a permitted landfill. The waste is considered hazardous because it will have residual HF in the material. The finished $LiPF_6$ product would be stored in a warehouse equipped with a loading dock on the eastern portion of the project site.

Currently, hazardous wastes generated on-site are transported offsite by Heritage Environmental Services and treated or disposed of at Rineco Chemical Industries. Under the proposed expansion, it is expected that similar partnerships or contractual arrangements would be maintained or expanded to ensure proper offsite management of increased hazardous waste volumes. As a large-quantity generator of hazardous waste, the facility is required to have a Preparedness and Prevention Program and a RCRA Contingency Plan in accordance with 40 CFR 262.34(a)(4) and to train its employees on the safe and proper handling of hazardous waste.

Mitigation Measures

During construction, preventative measures such as erecting fencing around the construction site, establishing contained storage areas, and controlling the flow of construction equipment and personnel would reduce the potential for a release or accident to occur. If a release or accident occurs, immediate action would be taken to contain, remediate, and dispose of any contaminated materials in accordance with Federal, State, and local regulations and site-specific spill plans. The facility would comply with all LQG storage, recordkeeping, disposal, and reporting requirements, as applicable. During operations, the adoption of safety and emergency response plans to include the new processes and the safe handling and storage of chemicals at the site as well as employee training limit the potential for a release at the plant.

3.10 Utilities and Energy Use

Affected Environment

The proposed facility would receive the same utility services that the existing Mexichem facility receives. Entergy provides electricity to the current facility, and an upgrade will be required to provide electricity to the proposed project site. Natural gas is provided by EnLink, no upgrades are required. Air Liquide, a neighboring industrial business, provides nitrogen. No upgrades are required to supply nitrogen to the proposed facility. Drinking water is provided by the City of St. Gabriel. Process water comes from wells within Mexichem's existing facility.

Construction

Construction of the proposed project would have short-term, negligible impacts on utilities, including electricity, gas, water, and sewer. During the construction period, the proposed project site would rely on a new tie into Iberville Parish water system and portable bathrooms to accommodate increase in demand for water and sewer from workers and equipment on the project site. Iberville parish would construct the tie in point with a 4-inch flange from which Mexichem would install their own pipeline to transport potable water to the project site. The transformers that are currently on Mexichem's property would be utilized to provide power to the project site during construction.

Operation

The proposed project requires the installation and use of utility services on the project site. It would have long-term, moderate impacts on local utilities and energy use as the industrial processes involved will increase the demand for electricity, water, gas, and sewer at the proposed project site. Infrastructure tie-ins to existing services and limited upgrades to existing utility

infrastructure are anticipated to be necessary for facility operation. To meet increased electricity demands from operation of the proposed project (31,407,998 kWh/yr) the transformer that is currently on site would be upgraded from a 10 MVA to a 20 MVA transformer. The upgraded transformer would remain within the same footprint as the previous transformer.

The proposed project is anticipated to increase demand for potable water by approximately 185,055 gallons per year, a quantity that would be procured by Mexichem from Iberville Parish. The tie-in point that will be established during the construction period will be utilized for the ongoing operation of the facility. To address wastewater generated by operations, the proposed project would use its existing internal pretreatment, then send water to an outfall at Olin. The anticipated increase in wastewater produced is 102,400 gpd. There are no anticipated upgrades for natural gas or nitrogen services.

Mitigation Measures

There are no mitigation measures for utility and energy use. The proposed project is anticipated to have a negligible impact to utilities and energy use during construction and a moderate impact during operations.

3.11 Transportation and Traffic

Affected Environment

The proposed action area is located within the Industrial Corridor that extends along the river between Baton Rouge and New Orleans. The proposed project site lies within a large area zoned for heavy industrial use and is approximately 7.95 miles west of Interstate 10. Access to I-10 is available by traveling north on LA Highway 75 for 1.3 miles, then turning east onto LA Highway 74 and continuing 7.83 miles to the interstate. The site is located approximately 0.75 miles west of LA Highway 75, which follows the Mississippi River levee. In addition, LA Highway 30 runs north of the site; traveling north on LA 30 leads to Baton Rouge, while traveling east leads to Geismar.

The Canadian National Railway runs parallel to the facility in a northwest direction before turning north at Ici Rd. Several spurs from this railroad extend into Mexichem and other nearby chemical facilities properties. The facility currently employs 80 full-time employees and daily traffic to and from the site reflects their commute trips and any truck deliveries to the site.

Construction

Short term, measurable impacts to traffic and transportation are expected during the construction phase of the proposed project. During the site preparation phase of the proposed project, the estimated traffic count would be 35 to 40 vehicles a day with a peak of 40 vehicles for six months. During the pile driving stage, the estimated traffic count would be 35 to 40 vehicles, with a peak of 40 vehicles for three months. During the heavy construction phase the traffic count is estimated to start off at 100 and continually increase to a peak of 200 for four months. The total construction period is anticipated to be 31 months from start to finish. The roads most impacted will be Ici

Road and Highway 75. Those roads are designed to accommodate industrial truck traffic and are not anticipated to be adversely affected by the increase in traffic.

Operations

The proposed project would generate minor long-term increases to traffic from the anticipated daily truck and personal vehicle traffic into and out of the industrial park. The number of full-time employees commuting to and from the site is expected to increase from 80 to 160. However, approximately half of these employees would be commuting to the site during the day and the other half at night. A traffic study was completed in June of 2025 and determined that no off-site improvements were needed to accommodate the increase in traffic . A Louisiana Department of Transportation and Development (LDOTD) traffic generator permit was obtained on December 8, 2025. The permit is included in Appendix G.

Traffic generated from the transportation of raw materials and final products is anticipated to increase from previous operations. Raw materials would enter the facility through railcar, pipeline, and trucks. The finished product would be packed in containers and transported via trucks offsite. There are no anticipated impacts to traffic on or offsite. There are no anticipated upgrades to rail or roadway infrastructure as a result of the operation of the proposed project.

Mitigation Measures

No mitigation measures are anticipated for transportation.

The proposed project is anticipated to have minor impacts to transportation and traffic during construction and operations.

3.12 Public and Occupational Health and Safety

The Mexichem facility maintains robust public and occupational health and safety protocols through the implementation of a facility-specific Emergency Response Plan (ERP). This plan establishes a systematic framework for identifying, mitigating, and managing process hazards and emergency scenarios, ensuring compliance with OSHA, EPA, and other regulatory requirements. Despite the presence of preventative safety measures, inherent operational risks necessitate a comprehensive emergency preparedness strategy.

The ERP defines critical personnel roles, emergency response procedures, incident communication protocols, and regulatory reporting requirements that ensure a structured and coordinated approach to risk management. It encompasses response actions for chemical releases, fires, natural disasters, and external threats, which integrate real-time hazard assessment and containment strategies. The facility conducts regular emergency response drills, personnel training, and compliance audits to enhance readiness and operational resilience. The ERP undergoes annual review and revision to align with evolving industry standards, regulatory mandates, and operational risk assessments in an effort to reinforce an efficient and proactive ERP.

Construction

A Hazard and Safety Plan (HASP) would be developed for the site that would incorporate protocols and action items for identified hazards onsite and mitigation measures for each hazard.

The HASP will also outline clear roles and responsibilities for all personnel to ensure accountability and consistent implementation of safety procedures. In addition, it would establish emergency response protocols, communication channels, and incident reporting requirements to promote swift and coordinated action in the event of an unforeseen event. Regular training sessions and safety drills would be incorporated to reinforce awareness and preparedness among staff. The plan would be reviewed and updated on a routine basis to account for changes in site conditions, applicable regulations, and newly identified hazards. Finally, monitoring and inspection procedures would be built into the HASP to ensure compliance and continuous improvement of safety practices.

Operations

Mexichem would operate using the existing ERP system, ensuring seamless integration with established processes and minimizing the need for additional infrastructure. In the event of an emergency, alarm systems, shelter-in-place protocols, and evacuation procedures would be activated to safeguard employees and surrounding communities. The facility would also implement shutdown, suppression, and decontamination procedures for fire and chemical incidents, while leveraging mutual aid agreements with neighboring facilities for added support. Strict adherence to OSHA construction safety regulations would be maintained, including the use of appropriate PPE, hazard controls, and comprehensive emergency response measures in high-risk environments. Preparedness would be reinforced through regular training, drills, and audits, with full-site emergency exercises conducted on an annual basis. Employees would receive continuous training in hazard recognition, PPE use, and evacuation protocols to ensure readiness at all times.

To maintain regulatory compliance, the LiPF6 operations would be integrated into the existing safety and environmental management systems.

In addition, the proposed facility would include a secure perimeter fence with reinforced entry points and 24/7 surveillance provided by high-resolution cameras strategically positioned throughout the site. A dedicated on-site security team would actively monitor live video feeds, conduct patrols fix or more times per twelve-hour shift, and manage access control to ensure rapid response to potential threats. Local law enforcement would further support security operations during the construction phase by assisting with traffic control, site patrols, and ensuring safe vehicle movement around the facility.

The nearest emergency service to the project site is the Iberville Parish Fire District #1 and Acadian Ambulance Station which are approximately 1.1 road miles away. The St. Gabriel Police Depart is 3.7 road miles away. These local first responders are equipped to handle emergencies at the many industrial facilities in the area. Additionally, industrial neighbors have agreements to provide mutual aid assistance as needed. Mexichem and other industries communicate with the Local Emergency Planning Committee (LEPC) that utilizes a parish wide warning system via text message.

Mitigation Measures

Mexichem would ensure ongoing compliance with federal, state, and local regulations by staying informed of legal updates through resources such as the Federal Register, Louisiana Register, trade journals, and professional organizations. The company's Louisiana Chemical Association (LCA) membership and environmental, health and safety, and governmental affairs committees will provide direct insight into regulatory developments. Regulatory updates would be communicated through site procedures and training programs ensuring all relevant personnel remain informed and compliant with evolving industry requirements.

4.0 References

All Phases Archeology, LLC. (2023). *Phase I Cultural Resources Survey (CRS) for the Proposed St. Gabriel Property*. St. Gabriel, Louisiana.LA Cultural Resources Map

Google. (n.d.). *Google Earth* (Version 9.x) [Computer software]. Google LLC. Retrieved [Month Day, Year], from https://earth.google.com

https://cityofstgabriel.us/sites/default/files/fileattachments/planning_and_zoning_commission/page/2563/comprehensive_zoning_ordinance.pdf

Federal Highway Administration. (n.d.). *Chapter 9: Construction Equipment Noise Levels and Ranges* (from *Highway Construction Noise Handbook*). U.S. Department of Transportation. Retrieved [access date], from https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm

Federal Railroad Administration, & New Jersey Transit Corporation. (2021, May). *Chapter 12B: Vibration* (Final Environmental Impact Statement and Final Section 4(f) Evaluation). U.S. Department of Transportation, Federal Railroad Administration. https://railroads.dot.gov/sites/fra.dot.gov/files/2021-05/12B%20Vibration_2021-05-27.pdf

Historic Aerials. (n.d.). *Historic Aerials: Viewer* [Web application]. Historic Aerials. Retrieved September 8, 2025, from https://www.historicaerials.com/viewer

INEOS Fluor North America. (2022). *Site Emergency Response Plan (SP-SF-014, Rev. 43)*.

INEOS Fluor North America. (2023, July 18). *Safety, Health, and Environmental Policy (SP-SHE-001, Rev. 12)*.

INEOS Fluor North America. (2022, November 7). *Identification and Review of Legal and Other Requirements (SP-SHE-002, Rev. 8)*

INEOS Fluor North America. (2024, March 20). *Safety, Health, & Environmental Training (SP-SHE-003, Rev. 11)*

INEOS Fluor North America. (2024, January 23). *Internal Compliance Evaluation (SP-SHE-004, Rev. 8)*

U.S. Census Bureau. (n.d.). *QuickFacts: Louisiana; Iberville Parish, Louisiana; St. Gabriel city, Louisiana; United States* [Web application]. https://www.census.gov/quickfacts/fact/table/LA,ibervilleparishlouisiana,stgabrielcitylouisiana,US/PST045224 [Accessed February 12, 2025]

U.S. Bureau of Labor Statistics. (n.d.). *U.S. Bureau of Labor Statistics* [Web application]. Retrieved February 2025, from https://www.bls.gov/ [Accessed February 12, 2025]

Data USA. (n.d.). *Iberville Parish, LA profile* [Web application]. https://datausa.io/profile/geo/iberville-parish-la [Accessed February 12, 2025]

Lindaman, M. A. (2024). *Chloride concentrations in groundwater from the western part of the Southern Hills regional aquifer system, Louisiana, 2021–22* (U.S. Geological Survey Scientific Investigations Report 2024–5057). U.S. Geological Survey. https://doi.org/10.3133/sir20245057

U.S. Geological Survey. (2021). *Water resources of Iberville Parish, Louisiana* (by M. A. Lindaman & V. E. White; U.S. Geological Survey Fact Sheet 2021–3014). U.S. Geological Survey. https://doi.org/10.3133/fs20213014

Louisiana Administrative Code. (n.d.). Title 33: Environmental Quality, Part XV: Chapter 14 — Regulation and Licensing of Naturally Occurring Radioactive Material (NORM). Retrieved September 8, 2025, from Justia: Title 33, Part XV, Chapter 14

Louisiana Department of Culture, Recreation & Tourism, Office of Cultural Development, Division of Archaeology. (n.d.). LA Cultural Resources Map [ArcGIS Experience application]. Retrieved September 8, 2025, from https://experience.arcgis.com/experience/eb1f50bf72d1494cb735268529630acf.

Louisiana Department of Energy and Natural Resources, Office of Conservation. (n.d.). *SONRIS GIS (Template ID 181)* [Web application]. SONRIS – Strategic Online Natural Resources Information System. Retrieved September 8, 2025, from https://sonris-www.dnr.state.la.us/gis/agsweb/IE/JSViewer/index.html?TemplateID=181

Louisiana Department of Environmental Quality. (n.d.). *Draft Air Permit No. 1280-00040-10*. Baton Rouge, LA. Retrieved September 8, 2025.

Natural Resources Conservation Service – Farmland Protection Policy Act, from https://www.nrcs.usda.gov/conservation-basics/land/cropland/farmland-protection-policy-act. Accessed May 5, 2026.

U.S. Fish and Wildlife Service. (n.d.) Information for Planning and Consultation (IPaC) [Web application]. https://ecos.fws.gov/ipac/ [Accessed April 16, 2025].

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. (n.d.). *Web Soil Survey* [Online application]. Available online: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. [Accessed August 19, 2025].

U.S. Geological Survey. (n.d.). *Latest earthquakes* [Interactive map]. USGS Earthquake Hazards Program. https://earthquake.usgs.gov/earthquakes/map/?currentFeatureId=usp000e6fr&extent=29.99479,-91.42685&extent=30.50548,-90.32822&range=search&sort=oldest&timeZone=utc&search={"name":"Search%20Results","params":{"starttime":"1900-01-01%2000:00:00","endtime":"2025-03-13%2023:59:59","maxlatitude":31.241,"minlatitude":29.152,"maxlongitude":-88.989,"minlongitude":-94.482,"minmagnitude":2.5,"orderby":"time-asc"}} [Accessed September 8, 2025]

Eustis Engineering LLC. (2024, May 24). Draft report: Geotechnical exploration for Koura Global Infrastructure Project Plant Expansion, St. Gabriel, Louisiana (Eustis Engineering Project No. B0782). Prepared for Mexichem Fluor Inc.

Vectura Consulting Services, LLC. (2025, June 17). *Traffic Impact Study: Koura Site: St. Gabriel, Louisiana*. Prepared for the City of St. Gabriel.

CSRS, LLC. (2025, August 22). *Koura Industrial Park – Drainage Impact Study: Draft for Review* (CSRS Project Number 222347). Prepared for Mexichem Fluor Inc.

5.0 List of Preparers

Department of Energy
Mr. Stephen Witmer, NEPA Compliance Officer, B.S., Environmental Science, 16 years NEPA experience
Mexichem Fluor, Inc.
Don Pulliam, HSE Manager, B.A.S., Environmental Science, 20 years of environmental experience
NEPA Contractor
Kelly Faerber, M.S. NEPA and Environmental Permitting Practice Lead M.S., Earth and Environmental Sciences B.S., Biological Sciences 21 years of experience, 10 years NEPA experience
Lauren Soileau, EI Environmental Engineer I B.S., Environmental Engineering 4 years of experience, 3 years NEPA experience

6.0 Distribution List

DOE coordinated with the following agencies, tribal nations, and stakeholders throughout development of the Draft EA. Entities were communicated with through consultation letters, meetings, e-mails, and/or notification of the availability of the Draft EA for review and comment.

State and Local Offices

Louisiana Office of the Governor – Jeff Landry
PO Box 94004
Baton Rouge, LA 70804
225-342-0991

Mayor Lionel Johnson, Jr.
Mayor – St. Gabriel, LA
5035 Iberville Street
P.O. Box 597
St. Gabriel, LA 70776
225-642-9600

Lionel Johnson, Jr.
Floodplain Administrator of St. Gabriel
P.O. Box 597
St. Gabriel, LA 70776
225-642-9600

Steve Gullotto
Floodplain Manager
Iberville Parish
P.O. Box 389
Plaquemine, LA 70765
225-687-5150

East Iberville Parish Library
5715 Monticello Drive
St. Gabriel, LA 70776
225-642-8380

State of Louisiana – Office of the Lieutenant Governor
Department of Culture, Recreation & Tourism
Office of Cultural Development
P.O. Box 44247
Baton Rouge, LA 70804
225-342-8200

Ms. Aurelia S. Giacometto
Secretary
Louisiana Department of Environmental Quality
P.O. Box 4301
Baton Rouge, LA 70821
225-219-3950

Federal Offices

U.S. Army Corps of Engineers
New Orleans District
P.O. Box 60267
New Orleans, LA 70160
504-862-1577

Robert Houston
U.S. Environmental Protection Agency
Region 6
Staff Director
Office of Communities, Tribes and Environmental Assessment
1201 Elm Street, Suite 500
Dallas, TX 75270
214-665-8565

U.S Fish and Wildlife Service
200 Dulles Drive, Lafayette, LA 70506
337-291-3113
Louisiana Ecological Services Field Office
Southeast Region

Tribal Nations

Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351
936-563-1100

Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005
405-247-9493

Chitimacha Tribe of Louisiana
P.O. Box 661
Charenton, LA 70523
337-923-9923

Coushatta Tribe of Louisiana
P.O. Box 10
Elton, LA 70532
337-584-1401

Jena Band of Choctaw Indians
P.O. Box 14
Jena, LA 71342
877-595-6239

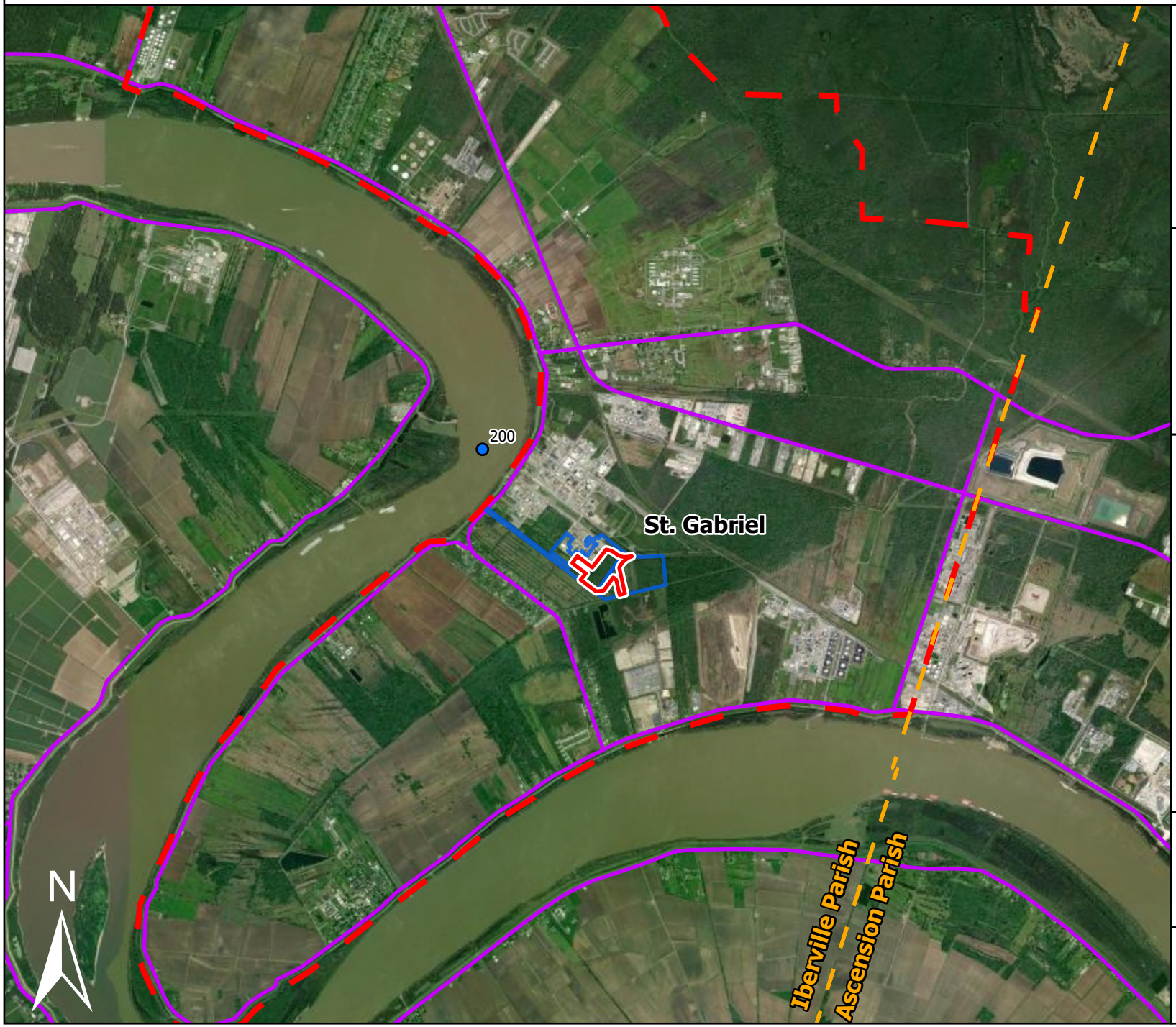
Mississippi Band of Choctaw Indians
101 Industrial Road
Choctaw, MS 39350
601-656-5251

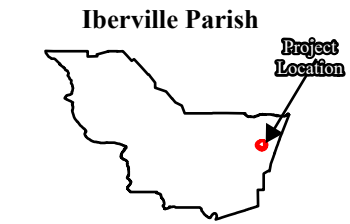
Muscogee (Creek) Nation
1008 East Eufaula Street
Okmulgee, OK 74447
918-732-7733

Seminole Tribe of Florida
6300 Stirling Road
Hollywood, FL 33024
954-966-6300

Figures

Figure 1: Location Map





Legend

- LiPF6 Site (±45 a.c.)
- Koura Parcels
- City Limits
- Mississippi River Mile Markers

Major Roads

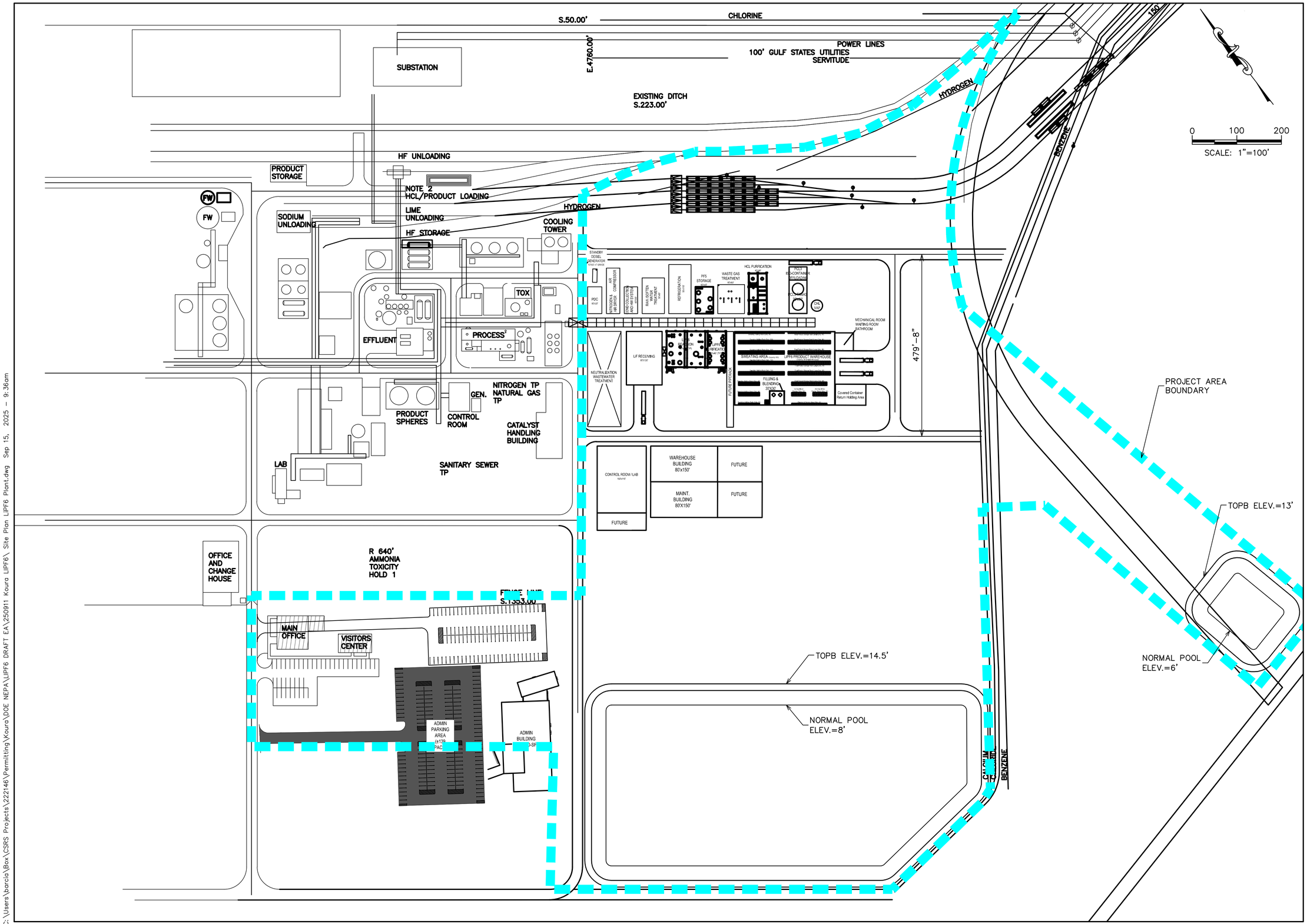
- Interstate
- State Highway
- US Highway
- Parish Boundary

0 0.33 0.65 1.3 Miles

CSRS
a Westwood company

Project Name:	Koura LiPF6
Project Number:	222146
Date:	8/27/2025
Drawn by:	LJS

Folder: C:\Users\soileau\Box\CSRS Projects\222146\Permitting\Koura\USACE Permitting\Permit Maps\



C:\Users\barcia\Box\CSRS Projects\222146\Permitting\Koura\DOE NEPA\LiPF6 DRAFT EA\250911 Koura LiPF6\ Site Plan LiPF6 Plant.dwg Sep 15, 2025 - 9:36am

CSRS
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com | westwoodps.com

Project:

Koura LiPF6
St. Gaberiel, LA

Client:

Koura
An Orbia Business

Revisions:

#	Date	Description

Sheet Title:

Figure 2 Site Map

Date:	09/15/25
Project Number:	222146
Drawn By:	CBB
Checked By:	LS

Sheet:

1.0

EARTHWORK TABLE		
	CUT	FILL
IMPACTED WATERS	4,164 CY	11,847 CY
IMPACTED WETLANDS	147 CY	1 CY

SCALE: 1" =500'

CSRS
8555 United Plaza Blvd Baton Rouge, LA 70808
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

SITE LAYOUT Figure 3: Wetlands Map

Date: JULY 2025

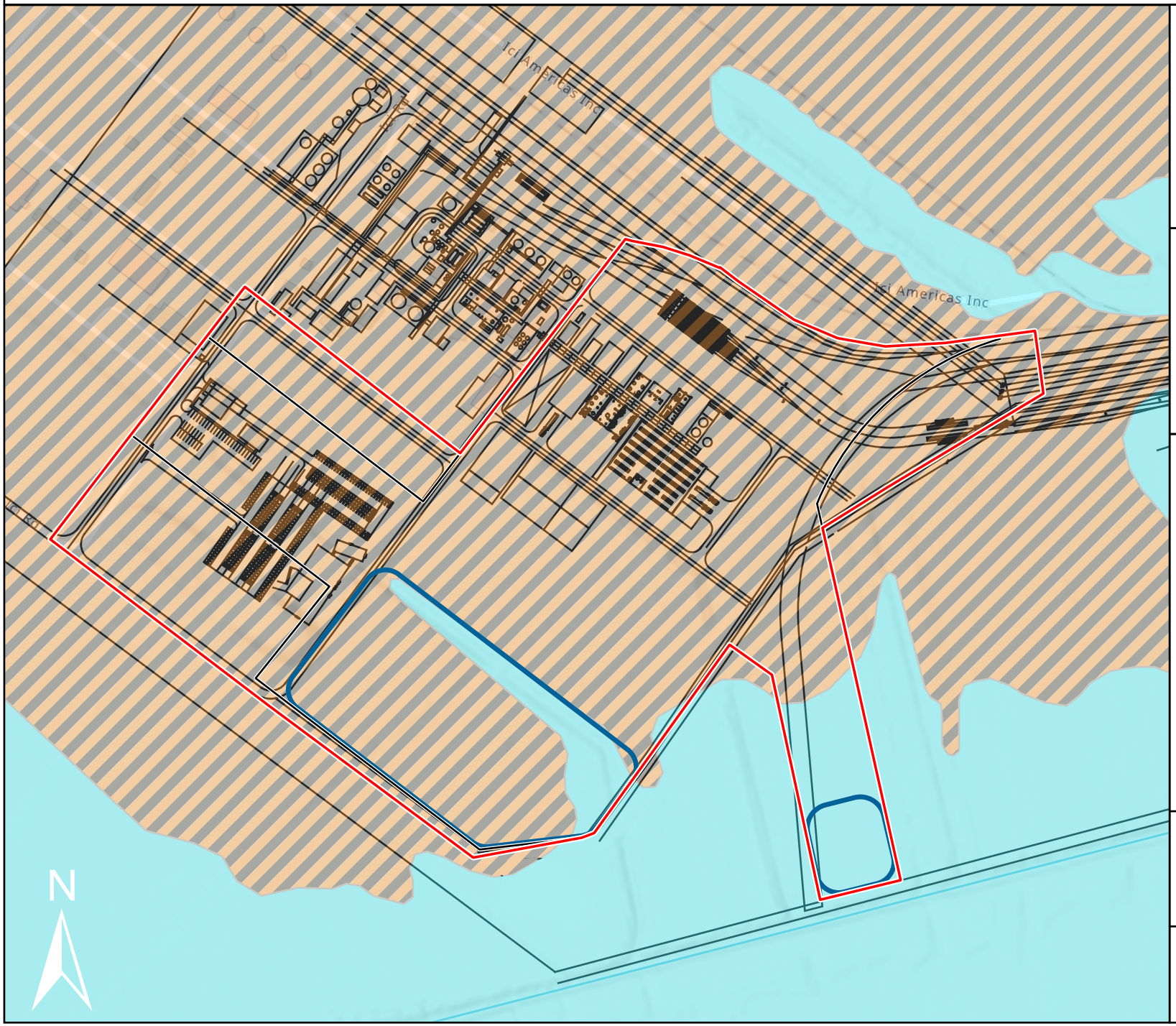
Project Number: 222347

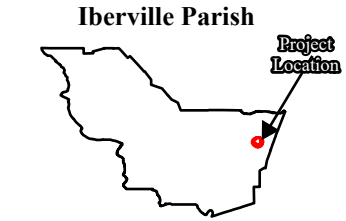
KOURA INDUSTRIAL
ST GABRIEL, LA

PRELIMINARY WORK
THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

CSRS
8555 United Plaza Blvd Baton Rouge, Louisiana 70809
Telephone: 225 769-0546
www.csrsinc.com

Figure 4: Floodplains Map





Legend

LiPF6 Site (±45 a.c.)

Flood Hazard Zones

1% Annual Chance Flood Hazard

Area with Reduced Risk Due to Levee

0 0.02 0.04 0.09 Miles

CSRS
a Westwood company

Project Name:	Koura LiPF6
Project Number:	222146
Date:	8/27/2025
Drawn by:	LJS

Folder: C:\Box\CSRS Projects\222146\Permitting\Koura\USACE Permitting\Permit Maps\

Appendix A - Agency Consultations

Louisiana Office of Cultural Development (LOCD)

April 14, 2025

Louisiana Office of Cultural Development
Division of Historic Preservation
Attn: State Historic Preservation Officer
1051 North 3rd Street, Room 405
Baton Rouge, LA 70802

Subject: Hard Copy of Phase One Cultural Resources Survey in Support of Consultation for DOE/EA-2236D

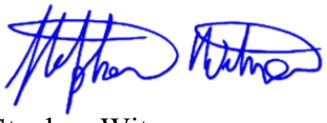
To Whom It May Concern,

The U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) National Environmental Policy Act Division had previously submitted electronic copies of a Phase One Cultural Resource Survey, along with details of a proposed project by Mexichem Fluor (Mexichem) partially funded by a DOE financial assistance grant to the Louisiana Office of Cultural Development. These materials were submitted to initiate Section 106 consultation as part of the development of a National Environmental Policy Act Draft Environmental Assessment (DOE/EA-2236D) for Mexichem's proposed project. Per a discussion with a member of your office (Sadie Whitehurst), I am submitting a hard copy of the Phase One Cultural Resource Survey for your review. I have also attached the cover letter and site plan for Mexichem's proposed facility that were also electronically submitted to your office, for reference.

If you have any questions concerning this project or the materials submitted, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Site Layout.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf
3. Mexichem_Section 106 Review consultation letter_4-11-2025

BILLY NUNGESSER
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

CARRIE BROUSSARD
INTERIM ASSISTANT SECRETARY

8 May 2025

Stephen Witmer
NEPA Compliance Officer
US Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Rd
Pittsburgh, PA 15236

Re: Draft Report
La Division of Archaeology Report No. 22-7798
A Phase I Cultural Resources Survey for the Proposed St. Gabriel Property, Iberville Parish, Louisiana

Dear Stephen Witmer:

We acknowledge receipt of your letter dated 14 April 2025 and one copy of the above-referenced report.

Based on the description of the Area of Potential Effect (APE), the proposed ground-disturbing activities, and the identification of historic properties within the APE, our office concurs that no historic properties listed in or eligible for listing in the National Register of Historic Places will be affected by this project. Our office has no concerns with this project.

Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal, and glass objects. The federal agency or the applicant receiving federal assistance should contact our office immediately. If human remains are encountered, the provisions of the Louisiana Unmarked Human Burial Sites Preservation Act (Revised Statute 8:671-681) should be followed.

We have accepted the report as final; no further submissions are necessary. If you have any questions, please contact Sadie Whitehurst at swhitehurst@crt.la.gov or 225-342-6931.

Sincerely,

Carrie Broussard

Carrie Broussard
State Historic Preservation Officer

Army Corps of Engineers (USACE)

U.S. Army Corps of Engineers (USACE)

AUTHORIZATION TO ACT AS AN AGENT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act, the proponent agency is CECW-COR.

Form Approved - OMB No. 0710-0003 Expires 2027-10-31

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-003, is estimated to average 5 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Purpose: This form is used by members of the public to authorize an agent (for example - a private consultant) to act on their behalf in all matters relating to all dealings with the USACE regarding the project. This includes taking all necessary actions for the application, processing, issuance, and/or acceptance of a Clean Water Act and/or Rivers and Harbors Act delineations, determinations, and/or permits.

This form is a component in the Corps Regulatory Request System (RRS), which is an online permitting application portal for the Regulatory Program.

ITEMS 1 THRU 3 - FOR USACE USE ONLY

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED

ITEMS 4 THRU 14 - COMPLETD BY THE APPLICANT or REQUESTOR

4. PROJECT NAME	5. PROJECT LOCATION
Koura LiPF6 Facility	St. Gabriel, Louisiana
6. APPLICANT NAME (*first, middle, last*)	7. AGENT NAME
Sean Cunningham	Elliott Boudreaux
Company (*if applicable*):	Company:
Mexichem - Koura	CSRS, LLC.
E-mail Address:	E-mail Address:
sean.cunningham@orbia.com	elliott.boudreaux@csrsinc.com
8. APPLICANT ADDRESS (*if applicable*)	9. AGENT ADDRESS (*if applicable*)
Address	Address
4990B ICI Road	8555 United Plaza Blvd.
City: St. Gabriel / State: LA	City: Baton Rouge / State: LA

10. APPLICANT PHONE NUMBERS. w/AREA CODE			11. AGENT PHONE NUMBERS. w/AREA CODE		
a. Residence	b. Business	c. Fax	a. Residence	b. Business	c. Fax
	(225) 776-6235			(225) 335-1716	

12. APPLICANT/AGENT CERTIFICATION

By signing below, I hereby authorize the agent listed above, to act on my behalf in all matters relating to all dealings with the USACE regarding the project and properties listed above, including taking all necessary actions for the application, processing, issuance, and/or acceptance of a Clean Water Act and/or Rivers and Harbors Act delineations, determinations, and/or permits. Any and all acts carried out by my agent on my behalf as it relates to this project and property shall have the same effect as acts of my own.

I agree to review all information submitted to the USACE on my behalf by my agent and certify that any information submitted on my behalf is true and correct.

13. SIGNATURE of APPLICANT or REQUESTOR	14. DATE
Sean Cunningham	2025-07-23

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

U.S. Army Corps of Engineers (USACE)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

For use of this form, see 33 CFR 325. The proponent agency is CECW-COR.

Form Approved - OMB No. 0710-0003

Expires: 2027-10-31

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcld.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED 07/25/2025	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First – Sean Middle – Last – Cunningham Company – Mexichem Fluor Inc. E-mail Address – sean.cunningham@orbia.com	First – Elliott Middle – Last – Boudreuax Company – CSRS, LLC E-mail Address – elliott.boudreaux@csrsinc.com
6. APPLICANT'S ADDRESS: Address – 4990B Ici Rd City – Saint Gabriel State – LA Zip - 70776 Country – US	9. AGENT'S ADDRESS: Address – 8555 United Plaza Blvd City – Baton Rouge State – LA Zip – 70809 Country – US
7. APPLICANT'S PHONE NOs. w/AREA CODE a. Mobile b. c. Fax +12257766235	10. AGENTS PHONE NOs. w/AREA CODE a. Primary b. c. Fax +12253351716

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Elliott Boudreuax to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

/s/ - provided on authorized agent form 07/25/2025

SIGNATURE OF APPLICANT Date

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Mexichem Fluor - St. Gabriel LiPF6 Plant

13. NAME OF WATERBODY, IF KNOWN (if applicable)

14. PROJECT STREET ADDRESS (if applicable)

Address

15. LOCATION OF PROJECT

City – St. Gabriel State – LA

Latitude: ◦N 30.2341463 Longitude: ◦W -91.0947048

Zip –

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality –

Section – Township – Range –

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

Mexichem Fluor Inc. (Mexichem) is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiPF6) manufacturing facility in St. Gabriel, Louisiana. Once completed, the Facility would produce LiPF6 to support domestic battery production. The Facility would be located within an existing industrial complex and is adjacent to an existing Mexichem fluoroproducts plant that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

This proposed LiPF6 expansion is the first of several future planned expansions at the Mexichem facility and surrounding property. At this time, the types of future projects, expansions, and details are not determined. Due to this expected phased approach of future expansions at this property, the applicant is anticipating that an Individual Permit will be required. However, if this project can qualify for alternate USACE permits such as a Nationwide or General Permit, the applicant is agreeable to amending this proposed permit application.

The Facility will be located immediately adjacent to an existing Mexichem plant that will provide the proposed facility utilities in addition to other infrastructure needs such as rail loading, cooling tower, and boilers. The Project will generally consist of a Control Room and Laboratory, an Administrative Building with associated parking area, Warehousing and Maintenance Buildings. Key chemical processing infrastructure will include a PCl3 offloading area designated for PCl3 chemical operations, PCl3 tanks and PF storage, as well as a LiF receiving area. The facility will also include a Refrigeration Unit and an HCl Purification Unit, along with a Raw/Soften Water Treatment Unit. The project will also require a series of stormwater retention ponds to adhere to city of St. Gabriel and Iberville Parish stormwater ordinances. Temporary construction areas for laydown and parking will also be located on site. Additional utility and support systems will feature a Covered Container Return Holding Area, Wastewater Treatment, Waste Gas Treatment system, and a Process Distribution Center (PDC). The production process will include a LiPF6 Reaction Area, a Sweating Area with multiple Sweating Holding Racks, and a LiPF6 Product Warehouse. Final stages of material handling will include a Cleaning and Purging Area and Final Product Storage Racks. Environmental controls and waste management systems will incorporate Neutralization and Wastewater Treatment facilities.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

This Facility will support the broader development of a resilient and stable domestic lithium-ion battery supply chain and reduce the need for Asian imports. The proposed Facility would create approximately 200 construction jobs and up to 40 new full-time jobs with benefits.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Discharges and impacts to wetlands and waters are required to support construction and long term operations of the proposed facility. All wetlands impacts are required to meet the Parish and City stormwater ordinances. Impacts to non-wetland waters are required to reroute existing drainage to the proposed retention ponds and accommodate permanent facilities and temporary construction areas.

21. Type(s) of Material Being Discharged and the Amount of Each Type:

See Appendix C

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

See Appendix C

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Each component of the project has been developed in order to reduce impacts to the greatest extent practical. The proposed project area is approximately 45 acres but is part of a larger 115-acre tract. The facility has been sited to avoid the majority of wetlands on the eastern section of the undeveloped property. The project proposes to offset the loss of impacted wetlands by purchasing compensatory mitigation credits through an approved wetlands mitigation bank within the associated watershed.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☑ No

If Yes, describe the completed work:

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address – 190 Carondelet Plz

City – Saint Louis State – MO Zip – 63105

b. Address – 4323 N River Rd

City – Port Allen | State – LA | Zip – 70767

c. Address – 4205 Highway 75

City – Saint Gabriel | State – LA | Zip – 70776

d. Address – 3905 Highway 75

City – Saint Gabriel | State – LA | Zip – 70776

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Department of Energy (DOE)	Draft Environmental Assessment - DOE National Energy Technology Laboratory	DOE/EA-2236D	06/01/2022		

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

/s/ - provided on authorized agent form		Elliott Boudreuax	07/25/2025
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Louisiana Department of Environmental Quality (LDEQ)

JEFF LANDRY
GOVERNOR

COURTNEY J. BURDETTE
SECRETARY

STATE OF LOUISIANA

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES

DEC 0 9 2025

Elliott Boudreaux
CSRS, LLC
8555 United Plaza Boulevard
Baton Rouge, Louisiana 70809

AI No.: 14535
Activity No.: CER20250001

RE: Mexichem Fluor Inc. – St. Gabriel LiPF6 Plant
Water Quality Certification WQC 250926-01
Corps of Engineers Permit MVN-2022-00332-CR
Iberville Parish

Dear Mr. Boudreaux:

The Louisiana Department of Environmental Quality, Water Permits Division (LDEQ), has reviewed the application requesting authorization to clear, grade, excavate, and place fill to expand Mexichem Fluor Inc.'s existing industrial operations off Ici Road in St. Gabriel, Iberville Parish. The proposed work includes the construction of a lithium hexafluorophosphate manufacturing facility and associated infrastructure adjacent to the existing Mexichem fluoroproducts plant.

The application and the additional information received November 18 and December 2, 2025, have been reviewed to assess compliance with State Water Quality Standards, the approved Water Quality Management Plan and applicable state water laws, rules and regulations. LDEQ has complied with its public notice procedures established pursuant to Clean Water Act Section 401(a)(1). LDEQ determined that the requirements for a Water Quality Certification have been met. LDEQ concludes that the discharge of fill will not violate water quality standards as provided for in LAC 33:IX.Chapter 11. Therefore, LDEQ hereby issues Mexichem Fluor Inc. – St. Gabriel LiPF6 Plant Water Quality Certification, WQC 250926-01.

Should you have any questions concerning any part of this certification, please contact Jace Hood at (225) 219-2743 or by email at jace.hood@la.gov. Please reference Agency Interest (AI) number 14535 and Water Quality Certification 250926-01 on all future correspondence to this Department to ensure all correspondence regarding this project is properly filed into the Department's Electronic Document Management System.

Sincerely,

Amanda Vincent, PhD, PMP
Assistant Secretary

c: IO-W

ec: jeremy.d.rodriguez@usace.army.mil

elliott.boudreaux@csrsinc.com

U.S. Fish and Wildlife Service (USFWS)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
Phone: (337) 291-3100 Fax: (337) 291-3139

In Reply Refer To: 10/08/2025 15:33:25 UTC
Project Code: 2025-0084028
Project Name: Mexichem LiPF6 Facility

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, and candidate species, as well as designated and proposed critical habitat that may occur within the boundary of your proposed project and may be affected by your proposed project. The Fish and Wildlife Service (Service) is providing this list under section 7 (c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Changes in this species list may occur due to new information from updated surveys, changes in species habitat, new listed species and other factors. Because of these possible changes, feel free to contact our office (337-291-3109) for more information or assistance regarding impacts to federally listed species. The Service recommends visiting the IPaC site or the Louisiana Ecological Services Field Office website (https://www.fws.gov/southeast/lafayette) at regular intervals during project planning and implementation for updated species lists and information. An updated list may be requested through the IPaC system 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 habitats 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 Federal trust resources and to determine whether projects may affect Federally listed 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)).

Bald eagles have recovered and were removed from the List of Endangered and Threatened Species as of August 8, 2007. Although no longer listed, please be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668 et seq.).

The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance", which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at: https://www.fws.gov/migratorybirds/pdf/management/nationalbaldeaglenanagementguidelines.pdf

Those guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. Onsite personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. If a bald eagle nest occurs or is discovered within or adjacent to the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation may be conducted on-line at: https://www.fws.gov/southeast/our-services/eagle-technical-assistance/. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary. The Division of Migratory Birds for the Southeast Region of the Service (phone: 404/679-7051, e-mail: SEmigratorybirds@fws.gov) has the lead role in conducting any necessary consultation.

Activities that involve State-designated scenic streams and/or wetlands are regulated by the Louisiana Department of Wildlife and Fisheries and the U.S. Army Corps of Engineers, respectively. We, therefore, recommend that you contact those agencies to determine their interest in proposed projects in these areas.

Activities that would be located within a National Wildlife Refuge are regulated by the refuge staff. We, therefore, recommend that you contact them to determine their interest in proposed projects in these areas.

Additional information on Federal trust species in Louisiana can be obtained from the Louisiana Ecological Services website at: https://www.fws.gov/southeast/lafayette

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 Tracking Number 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
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

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:

Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
(337) 291-3100

PROJECT SUMMARY

Project Code: 2025-0084028
Project Name: Mexichem LiPF6 Facility
Project Type: Refining - Non Energy
Project Description: Mexichem is proposing to expand its industrial operations in St. Gaberial, Louisiana to construct a hexafluorophosphate (LiPF6) manufacturing facility and supporting admin and non-industrial structures.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@30.23343905,-91.09578985550165,14z

Counties: Iberville County, Louisiana

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 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.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], 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
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

REPTILES

NAME	STATUS
Alligator Snapping Turtle *Macrochelys temminckii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed 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.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your project area.

Measures for Proactively Minimizing Eagle Impacts
For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the National Bald Eagle Management Guidelines. You may employ the timing and activity-specific distance recommendations in this document when designing your project/ activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to Bald Eagle Nesting and Sensitivity to Human Activity.

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

If disturbance or take of eagles cannot be avoided, an incidental take permit may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the Do I Need A Permit Tool. For assistance making this determination for golden eagles, please consult with the appropriate Regional Migratory Bird Office or Ecological Services Field Office.

Ensure Your Eagle List is Accurate and Complete
If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the Supplemental Information on Migratory Birds and Eagles, to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project

activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

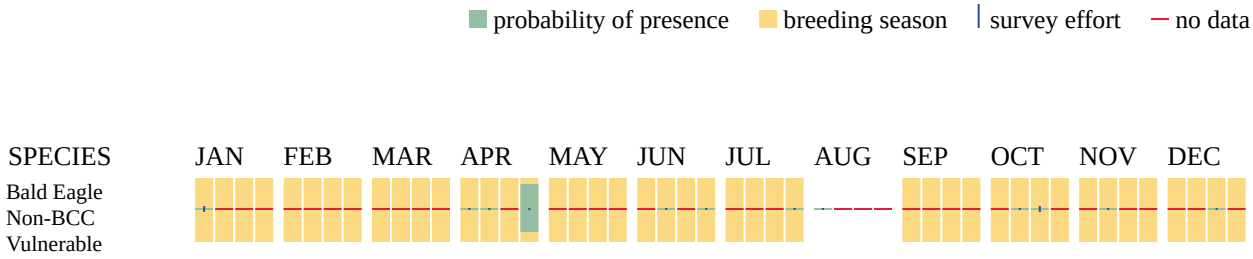
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Little Blue Heron *Egretta caerulea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9477	Breeds Mar 10 to Oct 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

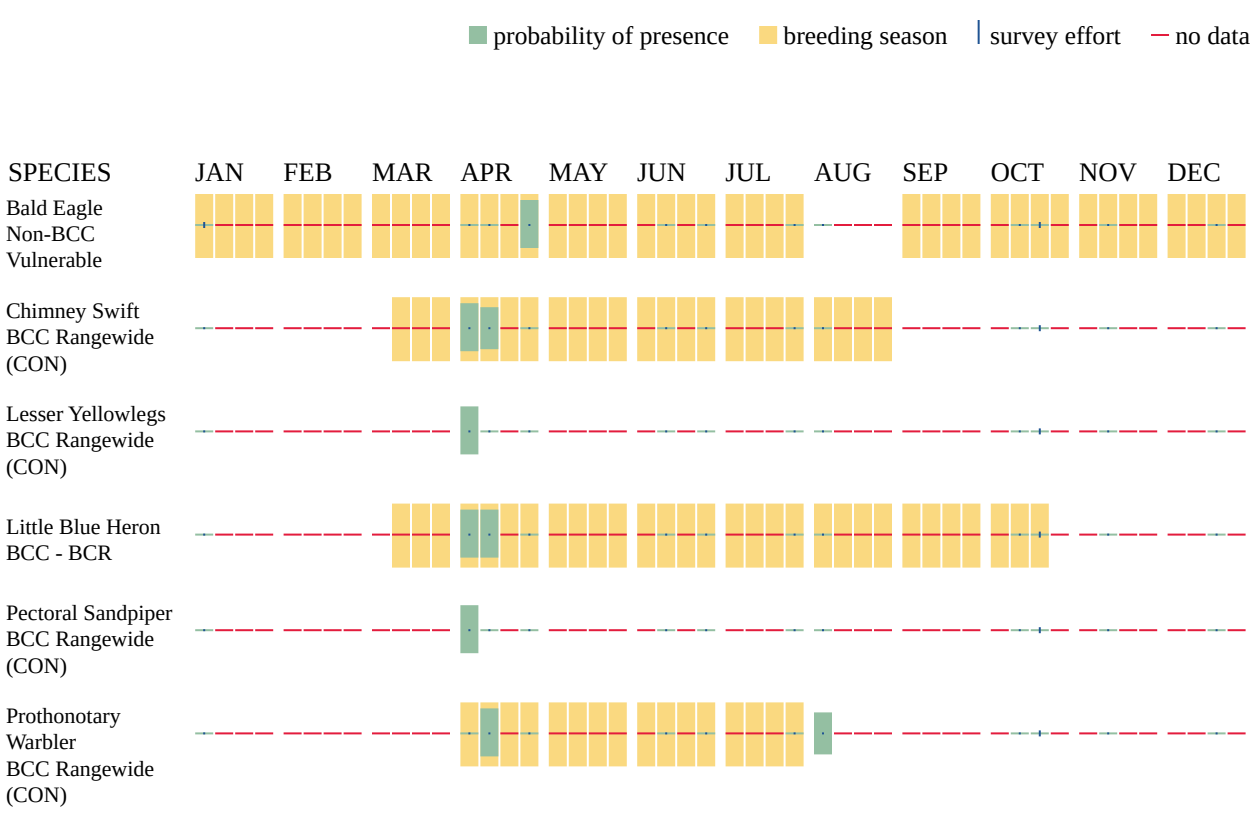
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Semipalmated Sandpiper
BCC - BCR

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: CSRS
Name: Lauren Soileau
Address: 8555 United Plaza Blvd
City: Baton Rouge
State: LA
Zip: 70809
Email lauren.soileau@csrsinc.com
Phone: 3374666537

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Department of Energy

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
Phone: (337) 291-3100 Fax: (337) 291-3139

In Reply Refer To: 02/04/2026 16:48:34 UTC
Project code: 2026-0045249
Project Name: Mexichem LiPF6

Federal Nexus: yes
Federal Action Agency (if applicable): Department of Energy

Subject: Technical assistance for 'Mexichem LiPF6'

Dear Lauren Soileau:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on February 04, 2026, for 'Mexichem LiPF6' (here forward, Project). This project has been assigned Project Code 2026-0045249 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project. **Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter.**

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	May affect

Federal agencies must consult with U.S. Fish and Wildlife Service under section 7(a)(2) of the Endangered Species Act (ESA) when an action *may affect* a listed species. Tricolored bat is proposed for listing as endangered under the ESA, but not yet listed. For actions that may affect a proposed species, agencies cannot consult, but they can *confer* under the authority of section 7(a)(4) of the ESA. Such conferences can follow the procedures for a consultation and be adopted as such if and when the proposed species is listed. Should the tricolored bat be listed, agencies must review projects that are not yet complete, or projects with ongoing effects within the tricolored bat range that previously received a NE or NLAA determination from the key to confirm that the determination is still accurate. Projects that receive a may affect determination for tricolored bat through the key, should contact the appropriate Ecological Services Field Office if they want to conference on this species.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Alligator Snapping Turtle *Macrochelys temminckii* Proposed Threatened
- Monarch Butterfly *Danaus plexippus* Proposed Threatened

You may coordinate with our Office to determine whether the Action may cause prohibited take of the species listed above.

Conclusion

Consultation with the Service is not complete. Further consultation or coordination with the Service is necessary for those species or designated critical habitats with a determination of “May Affect.” A “May Affect” determination in this key indicates that the project, as entered, is not consistent with the questions in the key. Not all projects that reach a “May Affect” determination are anticipated to result in adverse impacts to listed species. These projects may result in a “No Effect”, “May Affect, Not Likely to Adversely Affect”, or “May Affect, Likely to Adversely Affect” determination depending on the details of the project. Please contact our Louisiana Ecological Services Field Office to discuss methods to avoid or minimize potential adverse effects to those species or designated critical habitats.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Mexichem LiPF6

2. Description

The following description was provided for the project 'Mexichem LiPF6':

> Mexichem is proposing to expand its industrial operations in St. Gaberial, Louisiana to construct a hexafluorophosphate (LiPF6) manufacturing facility and supporting admin and non-industrial structures.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@30.2336236,-91.09595150328583,14z

Conservation measures, detailed in the above letter, will be implemented as part of this project to reduce effects of this project on the tricolored bat.

The Fish and Wildlife Service (Service) has reviewed the information provided and offers the following comments in accordance with the provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended, 16 U.S.C. 1531 et seq.). Based on the description of the proposed action and the responses you provided while using the Information, Planning, and Conservation (IPaC) system for project review, we concur with the Federal Action Agency's Section 7 ESA determination that the implementation of the proposed action is "not likely to adversely affect" the federally listed species analyzed in this consultation.

The Federal Action Agency may need to reassess the potential impacts of the project on federally protected species if any of the following occur: (1)The scope or location of the proposed project is changed; (2) New information reveals that the action may affect listed species or designated critical habitat; (3)The action is modified in a manner that causes effects to listed species or designated critical habitat; or (4) A new species is listed, or critical habitat is designated.

05/04/2026

Brigette D. Firmin DATE
FOR Field Supervisor
Louisiana Ecological Services Office

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   Yes

3. Your project overlaps with Zone 2 of the area where northern long-eared bats and tricolored bats may be present and roosting in trees year-round.

   Do you understand that your project may impact bats at any time during the year?

   Yes

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

   No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Note for projects in Pennsylvania: Projects requiring authorization under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act would be considered as having a federal nexus. Since the U.S. Army Corps of Engineers (Corps) has issued the Pennsylvania State Programmatic General Permit (PASPGP), which may be verified by the PA Department of Environmental Protection or certain Conservation Districts, the need to receive a Corps authorization to perform the work under the PASPGP serves as a federal nexus. As such, if proposing to use the PASPGP, you would answer ‘yes’ to this question.

   Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   No

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum or winter roost? Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

    Automatically answered

    No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    No

12. Will the action cause effects to a bridge?

    Note: Covered bridges should be considered as bridges in this question.

    No

13. Will the action result in effects to a culvert or tunnel at any time of year?

    No

14. Are trees present within 1000 feet of the action area?

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

15. Does the action include the intentional exclusion of bats from a building or building-like structure? **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    No

16. Does the action involve removal, modification, or maintenance of a human-made building-like structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

17. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average night-time traffic permanently or temporarily on one or more existing roads? **Note:** For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

20. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    Note: For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

22. Will the action include drilling or blasting?

    No

23. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use at night)?

    No

24. Will the proposed action involve the use of herbicides or pesticides (e.g., fungicides, insecticides, or rodenticides)?

    No

25. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

26. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

27. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

28. Is the project related to the production of coal, including projects that support the mining of coal, as well as the production and/or distribution of energy produced from coal?

    No

29. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

    No

30. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

    No

31. Does the project intersect with the 0- 9.9% forest density category?

    Automatically answered
    No

32. Does the project intersect with the 10.0- 19.9% forest density category map?

    Automatically answered
    Yes

33. Does the project intersect with the 20.0- 29.9% forest density category map?

    Automatically answered
    No

34. Does the project intersect with the 30.0- 100% forest density category map?

    Automatically answered
    No

35. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 5 acres in total extent?

    Yes

36. Does the action area intersect the tricolored bat species list area?

    Automatically answered
    Yes

37. Is the action area located within 0.5-mile of radius of an entrance/opening to any known tricolored bat hibernacula or winter roost?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state wildlife agency.

    Automatically answered
    No

38. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats? **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

39. Your project overlaps with an area where tricolored bats may be present and roosting in trees year-round.

    Has a presence/probable absence survey for the tricolored bat following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area? If unsure, answer "No."

    No

40. Your project overlaps with an area where tricolored bats may be present and roosting in trees year-round.

    Is suitable tricolored bat habitat present within 1000 feet of project activities? Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (*Tillandsia usneoides*), clusters of dead pine needles of large live pines) answer "Yes." Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

41. Do you have any documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

45

IPAC USER CONTACT INFORMATION

Agency: Westwood Professional Services
Name: Lauren Soileau
Address: 8555 United Plaza Blvd
City: Baton Rouge
State: LA
Zip: 70809
Email lauren.soileau@westwoodps.com
Phone: 3374666537

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Department of Energy

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

Appendix B - Tribal Consultations

April 15, 2025

Bryant Celestine
Tribal Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Mr. Celestine,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana. Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated.

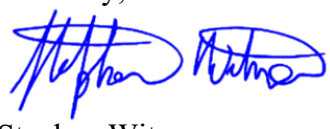
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided with electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

April 15, 2025

Ricky Sylestine
Chairman
Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chairman Sylestine,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana. Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

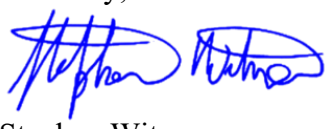
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided with electronic and hard copies where you may provide additional comments.

If you have any questions or comments concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Bryant Celestine, Tribal Historic Preservation Officer, Alabama-Coushatta Tribe of Texas

Alabama-Coushatta Tribe of Texas

Tribal Historic Preservation Office

571 State Park Road 56 • Livingston, TX 77351 • (936) 563-1181

05/19/2025

U.S Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236

SUB: DOE/EA 2236D – Saint Gabriel, LA – LiPF6 Manufacturing Plant Project

Greetings sir/madam,

The Alabama-Coushatta Tribal Historic Preservation Office is deeply committed to preserving historic tribal lands. We seek to conserve our tribal footprint, culture, artifacts, and natural habitat. We thank you for your inquiry.

The Tribe maintains a record and database of cultural, historic, and pre-historic resources in this area. After reviewing this project, cross referenced the project's legal description against our information, and we have found no instances where this project intersects or adjoins such resources. Therefore, the Alabama-Coushatta Tribe appreciates the notification and the opportunity to comment within the time available; ***we have no comments***.

However, if the project plans change in any way, the Tribe requests to please contact the Historic Preservation Office for further consultation if items of cultural significance are discovered during the project. Additionally, if you require more information or questions, please contact me at your earliest convenience.

Aliilamolo/Aliilamo,

Delvin Johnson
Tribal Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56, Livingston, TX 77315
Delvin.Johnson@actribe.org
936.563.1181

April 15, 2025

Matthew Tselee
Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chairman Tselee,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated.

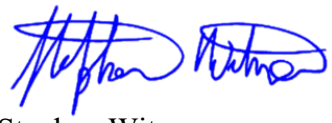
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

April 15, 2025

Melissa Darden
Chairman
Chitimacha Tribe of Louisiana
155 Chitimacha Loop
Charenton, LA 70523

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chairman Darden,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

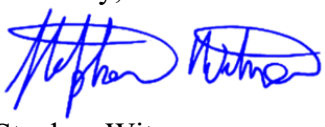
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Kimberly Walden, Tribal Historic Preservation Officer - Chitimacha Tribe of Louisiana

April 15, 2025

Kimberly Walden
Tribal Historic Preservation Officer
Chitimacha Tribe of Louisiana
P.O. Box 661
Charenton, LA 70523

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Ms. Walden,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

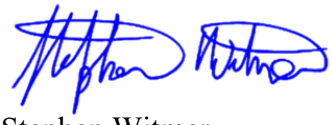
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Melissa Darden, Chairman – Chitimacha Tribe of Louisiana

April 15, 2025

Kristian Poncho
Tribal Historic Preservation Officer
Coushatta Tribe of Louisiana
P.O. Box 10
Elton, LA 70532

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Kristian Poncho,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

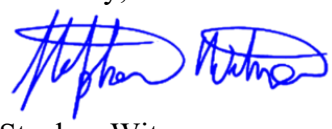
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Crystal Williams, Vice Chair – Coushatta Tribe of Louisiana

April 15, 2025

Crystal Williams
Vice Chair
Coushatta Tribe of Louisiana
1940 C.C. Bel Road
Elton, LA 70532

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Crystal Williams,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

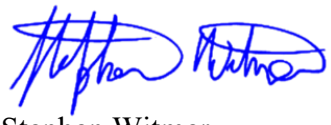
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Kristian Poncho, Tribal Historic Preservation Officer – Coushatta Tribe of Louisiana

April 16, 2025

Johnna Flynn
Tribal Historic Preservation Officer (Acting)
Jena Band of Choctaw Indians
P.O. Box 14
Jena, LA 71342-0014

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Ms. Flynn,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

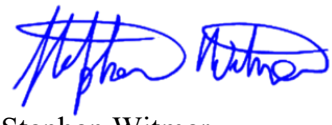
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Libby Rogers, Tribal Chief – Jena Band of Choctaw Indians

April 16, 2025

Libby Rogers
Tribal Chief
Jena Band of Choctaw Indians
1052 Chanaha Hina Street
Trout, LA 71371

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chief Rogers,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,

Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Johnna Flynn, Tribal Historic Preservation Officer (Acting) – Jena Band of Choctaw Indians

April 15, 2025

Cyrus Ben
Chief
Mississippi Band of Choctaw Indians
101 Industrial Road
Choctaw, MS 39350

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chief Ben,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated.

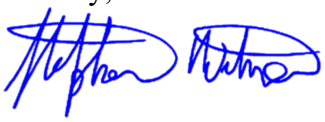
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

April 16, 2025

David Hill
Principal Chief
Muscogee (Creek) Nation
1007 East Eufaula Street
Okmulgee, OK 74447

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Chief Hill,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

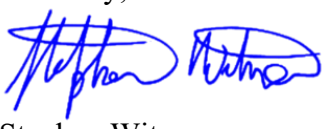
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Turner Hunt, Tribal Historic Preservation Officer – Muscogee (Creek) Nation

April 16, 2025

Turner Hunt
Tribal Historic Preservation Officer
Muscogee (Creek) Nation
P.O. Box 580
Okmulgee, OK 74447

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Mr. Hunt,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

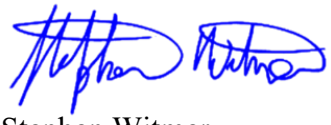
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
David Hill, Principal Chief – Muscogee (Creek) Nation

April 16, 2025

Tina Marie Osceola
Tribal Historic Preservation Officer
Seminole Tribe of Florida
30290 Josie Billie Highway, Pmb. 1004
Clewiston, FL 33440

Subject: Tribal Consultation and Section 106 Compliance for the U.S. Department of Energy's Proposed Funding to Mexichem Fluor, Inc. for the LiPF6 Manufacturing Plant Project – St. Gabriel, LA (DOE/EA-2236D)

Dear Ms. Osceola,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Mexichem Fluor, Inc. (Mexichem – also known as Koura) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

Mexichem is proposing to expand their existing industrial operations in St. Gabriel, Louisiana to construct a lithium hexafluorophosphate (LiP6F) manufacturing facility (Facility) in St. Gabriel, Louisiana (adjacent to 4990B Ici Road, St. Gabriel, LA 70776). Once completed, the Facility would produce 10,000MT of LiPF6 per year to support domestic production of more than one million full electric vehicles annually. Mexichem currently owns and operates the world's largest fluorspar mine that allows a unique "mine to market" vertically integrated position in fluorine technology and investment in recycled and alternative sources. The Facility would be located within an existing industrial complex and adjacent to an existing Mexichem fluoroproducts manufacturing facility that will supply several of the raw material inputs for the Facility. The Facility would utilize world class licensing technology to produce reliable and high quality LiPF6 to meet growing demand for a domestic supply of LiPF6.

The proposed Facility will consist of 25-acres including both permanent operations and temporary construction measures. In January 2023, a Phase I Cultural Resources Survey for the Proposed St. Gabriel Property was completed by All Phases Archeology, LLC. The area subject to the survey consisted of 105 acres (42.5 hectares) and encompasses the entire proposed Facilities footprint. The purpose of this survey was to determine if any prehistoric or historic properties exist within the limits of the Project Area, and if so, to document and assess each based on the National Register of Historic Places (NRHP) criteria. The Project Area is the same as the area of potential effect (APE). No cultural resources were encountered within the Project Area, and no historic properties are present within the Project Area.

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

I have attached additional details regarding Mexichem's proposed project, including the project boundary and Phase I Cultural Resources Survey noted above. If your review of the proposed project concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgement of that conclusion would be appreciated. Please feel free to provide any additional comments or questions you may have regarding this proposed project.

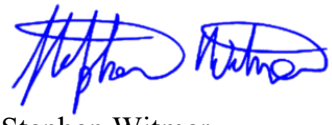
Based on the scope of the proposed Mexichem project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2236D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, you will be provided electronic and hard copies where you may provide additional comments.

If you have any questions concerning this proposed project or the NEPA process, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Mexichem Project Boundary.pdf
2. St. Gabriel Property Phase One Cultural Resources Survey_2-15-2023.pdf

cc:
Marcellus Osceola, Chairman – Seminole Tribe of Florida

Appendix C -
Wetland and Floodplain Resources

303 Rue Louis XIV, Suite 202
Lafayette, LA 70508

Corporate Headquarters
6575 West Loop South, Suite 300
Bellaire, TX 77401
Main: 713.520.5400

April 1, 2026

US Army Corps of Engineers
Regulatory Branch
4155 East Clay Street
Vicksburg, MS 39183-3435
ATTN: Jeremy Rodriguez

Mr. Rodriguez -

Fifth Louisiana Resource, L.L.C. has debited 0.5 Bottomland Hardwood acre from its Morgan Branch Mitigation Bank on behalf of Mexichem Fluor - St. Gabriel LiPF6 Plant for unavoidable work by the Department the Army permit number MVN-2022-00332.

Fifth Louisiana Resource, L.L.C. assumes the responsibility for the mitigation requirements (i.e., to implement, assure performance, and provide long-term management of the compensatory mitigation project) in accordance with provisions of the Mitigation Banking Instrument governing this bank.

Thank you,

Brittany Lancon
Client Solutions Manager
blancon@res.us | 337.380.3829

CSRS | BUILDING STRONGER, SMARTER COMMUNITIES TOGETHER.
a Westwood company

Drainage Impact Study

Draft for Review

KOURA INDUSTRIAL PARK

St. Gabriel, LA 70776

CSRS Project Number: 222347

Prepared by:

CSRS, a Westwood company

8555 United Plaza Blvd.

Baton Rouge, LA 70809

CONTENTS

1. Introduction

This document was prepared to serve as the Drainage Impact Study for the proposed Koura Industrial expansion and to show compliance with the city of St. Gabriel's Flood Prevention Ordinances as well as Article 6 of the Iberville Parish Code of Ordinances.

2. General Project Description And Location

2.1. Facilities

The industrial expansion is a total of 2 lots consisting of ±45 acres located on Ici Road adjacent to LA Highway 75 in the city of St. Gabriel, Louisiana. The proposed project will consist of a chemical plant expansion as well as associated drives, truck docking areas, loading areas, parking areas, and laydown areas.

2.2. Site Location

The proposed development is located in Iberville Parish, Louisiana. The property is bounded by Ici Rd to the west, Illinois Central railroad to the north, and an Iberville Parish drainage lateral to the south.

2.3. Site Description

The pre-developed site is a large undeveloped fielded and forested area, with a portion containing existing buildings and parking lots at the northwest corner. Existing ground elevations range from 13 to 19 feet. Soils at the site consist of Commerce silt loam (Cl), Commerce silty clay loam (Cm), and Sharkey clay (Sg). The USDA NRCS soils report is located in **Appendix 2**.

3. Watershed

3.1. General

The proposed development will drain to the existing Iberville Parish drainage lateral that borders the southern property line, then flows northeast towards Bayou Braud which flows north and ultimately outfalls into Bayou Paul.

4. Drainage Map & Catchment Areas

4.1. Existing Site Drainage Characteristics

A detailed analysis of the topography from survey data and LiDAR reveals the existing site is divided into one (1) main drainage area.

Drainage area A flows south via sheet flow and into a system of private ditches that outfall into the existing Iberville Parish drainage lateral that borders the southern property line. The lateral then flows east and outfalls into Bayou Braud. There is one (1) existing ditch that carries runoff from upstream properties across the site into the existing Iberville Parish drainage lateral.

The regional drainage area map can be viewed in **Exhibit 3.** The existing drainage conditions map can be viewed in **Exhibit 4**.

4.2. PROPOSED SITE DRAINAGE CHARACTERISTICS

The proposed drainage layout will have two (2) on-site drainage areas.

Drainage area A1 consists of the proposed plant expansion, a proposed laydown area, and a proposed detention pond. This drainage area will utilize a combination of subsurface drainage systems and drainage ditches / swales to reach the on-site detention pond A1. The pond will outfall into an existing ditch that flows towards the Iberville Parish drainage lateral. The existing ditch that carries runoff from upstream properties (mentioned in the previous section) will be incorporated into proposed pond A1. There are two existing culverts which convey flow southeast from the existing ditch across an existing pipeline corridor. These pipes will be extended into the new pond footprint. This will allow the runoff entering the pond from upstream properties to exit the pond at the same rate that the existing culverts now allow. There will be a proposed third culvert placed in-line with the existing culverts that will serve as the site-specific outfall structure. This outfall structure will be used to ensure that the runoff rates from existing to proposed conditions are not increased.

Drainage area A2 consists of a proposed laydown area, and a proposed detention pond. This drainage area will utilize a combination of drainage ditches and swales to reach the on-site detention pond A2. The pond will outfall directly into the Iberville Parish drainage lateral at the southern property line.

The proposed drainage conditions map can be viewed in **Exhibit 5**.

4.3. EXISTING AND PROPOSED LAND COVER

The existing on-site land cover consists mostly of wooded and fielded areas, with a portion consisting of existing buildings and parking areas that are to be modified. The proposed developed site will consist of a chemical plant expansion as well as associated drives, truck docking areas, loading areas, parking areas, and laydown areas. Pre-developed and post-developed land coverage characteristics (utilizing weighted curve numbers) may be referenced from the following table:

	Existing	***Proposed***
Weighted Curve Number (CN)	76	93

5. HYDRAULIC DESIGN

5.1. HYDRAULIC CRITERIA AND STORM DESIGN

- Storm Frequency – 10-year and 100-year storm events
  - 10-year rainfall depth: 8.2” over 24 hours
  - 100-year rainfall depth: 12.0” over 24 hours
- Time of Concentration Calculation – TR-55 worksheet method (see **Appendix 1**)
- Peak Flow Rate Calculations – HydroCAD using SCS Method (see **Appendix 1**)
- Pond Sizing – HydroCAD using SCS Method (see **Appendix 1**)
- Offsite Impacts Analysis – HEC-RAS 2D analysis (see **Appendix 2**)

5.2. EXISTING CONDITIONS ANALYSIS

The table below includes the results of the existing conditions drainage area runoff calculations for the 10-year and 100-year peak flows. These results were developed utilizing the "Existing Drainage Conditions Map" depicted in **Exhibit 4** and the HydroCAD Peak Flow Calculations, which can be viewed in **Appendix 1**.

Sub-Basin	Drainage Area (acres)	Weighted Curve Number (CN)	Time of Conc. (min)	10-Year Peak Discharge (cfs)	100-Year Peak Discharge (cfs)
A	44.861	76	106.6	76.27	125.90

5.3. PROPOSED CONDITIONS ANALYSIS (UNDETAINED)

The table below includes the results of the proposed conditions drainage area runoff calculations for the 10-year and 100-year peak flows. These results were developed utilizing the "Proposed Drainage Conditions Map" depicted in **Exhibit 5** and the HydroCAD Peak Flow Calculations, which can be viewed in **Appendix 1**.

.

Sub-Basin	Drainage Area (acres)	Weighted Curve Number (CN)	Time of Conc. (min)	10-Year Peak Discharge (cfs)	100-Year Peak Discharge (cfs)
A1	40.026	93	7.7	293.53	435.29
A2	4.835	93	10.6	32.40	48.06

5.4. DETENTION ANALYSIS

Proposed detention pond systems were utilized in the post-developed analysis of this site, for both drainage areas A1 and A2. Each drainage area will drain to its corresponding detention pond (drainage area A1 to pond A1 and drainage area A2 to pond A2). The proposed ponds will limit the outfall location's post-developed flow rate (based on the 100-year storm event) to the less than or equal to the pre-developed flow rate (based on the 10-year storm event) through the use of the outfall pipes being used as control structures. The 100-year storm event is contained within each of the ponds top banks, with no outflow. The sizing of the control structures are detailed in **Appendix 1** – Pre vs. Post Conditions Hydraflow Hydrographs Analysis (10-year and 100-year Storm Events). The peak water surface elevation and peak discharge rates of the pond system have been modeled using HydroCAD SCS methodology and are summarized in the table below.

5.4.1. DETENTION STORAGE SUMMARY (PEAK WATER SURFACE ELEVATIONS)

POND	Area (acres)	Top Bank Elev. (ft)	Storage Bottom Elev. (ft)	Storage (acre-feet)	Outfall Structure	10-year P.W.S (ft)	100-year P.W.S (ft)
A1	8.88	14.50	8.00	46.56	24" PVC	10.35	11.49
A2	1.10	13.00	6.00	4.21	24" PVC	8.11	8.87

5.4.2. Detention Storage Summary (Peak Discharge Rates)

POND	Area (acres)	Top Bank Elev. (ft)	Storage Bottom Elev. (ft)	Storage (acre-feet)	Outfall Structure	10-year Peak Discharge (cfs)	100-year Peak Discharge (cfs)
A1	8.88	14.50	8.00	46.56	24" PVC	19.28	25.36
A2	1.10	13.00	6.00	4.21	24" PVC	14.14	19.39

5.5 Exit Point Runoff Rates

The peak pre-developed runoff and peak post-developed runoff rates were analyzed at the overall site confluence to the east, where the limits of the property drain towards. The total area outfalling to the Iberville Parish drainage lateral utilized the proposed detention pond systems in order to result in a post-developed runoff rate (100-year storm) less than that of existing conditions (10-year storm event). The details can be reviewed in **Exhibit 4**, **Exhibit 5,** and **Appendix 1**.

Outfall No.	Existing Conditions, (cfs)		Proposed Conditions, (cfs)	
	Q_{10}	Q_{100}	Q_{10}	Q_{100}
1	76.27	125.90	31.93	43.06

6. Offsite Impacts Analysis

To ensure the proposed site improvements will not adversely impact the upstream and downstream property with runoffs draining through the site. A full 2D H&H model of the study area was developed using HEC-RAS v6.4.1 in analyzing of the pre-development and post-development drainage conditions.

The topography used in the HEC-RAS model is based on the 2020 Coastal Louisiana LiDAR dataset. Elevations in the dataset was referenced to NAVD 88 (GEOID 12B). The Soil Survey Geographic (gSSURGO) 2020 Dataset from USDA was used to define soil data in the model domain. The National Land Cover Database's (NLCD) 2021 gridded dataset was used to define land cover types.

The 2D computational mesh for all geometries has a base square cell size of 250 by 250 feet. The final mesh for both the existing and proposed conditions is identical and contains approximately 47,000 cells. The mesh was developed to capture critical high ground features and channel features by utilizing the breaklines to create a varied resolution (cell sizes).

Hydraulic structures included in the model were developed based on newly collected field survey data in major channels. For cross drain and subsurface structures on the project site, they were implemented as terrain modifications to ensure water was still able to collect and convey onsite and offsite runoffs during rainfall events.

Rain-on-Grid precipitation was utilized for the simulation of the design storms. Total rainfall depths for the design storm event was based on the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 Point Precipitation Frequency Estimates within the model area. The Soil Conservation Service (SCS) Type-III distribution, 100-Year, 24-hour duration design storm event (rainfall depth at 12 inches) was utilized for the existing and

proposed conditions as following the St. Gabrial relevant Criteria for assessing the offsite drainage and flow pattern obstruction impacts.

The proposed development was located southwest of the existing industrial area, which was intended to obstruct two off-site flows that would drain through the proposed development site. The existing conditions and proposed conditions terrain are shown in Figure 1 and 2. To mitigate the potential impacts from the obstruction, two culvert structures were proposed to convey the flows through the development site without increasing the peak water surface elevation for both upstream and downstream. The culvert locations can be found in Figure 2

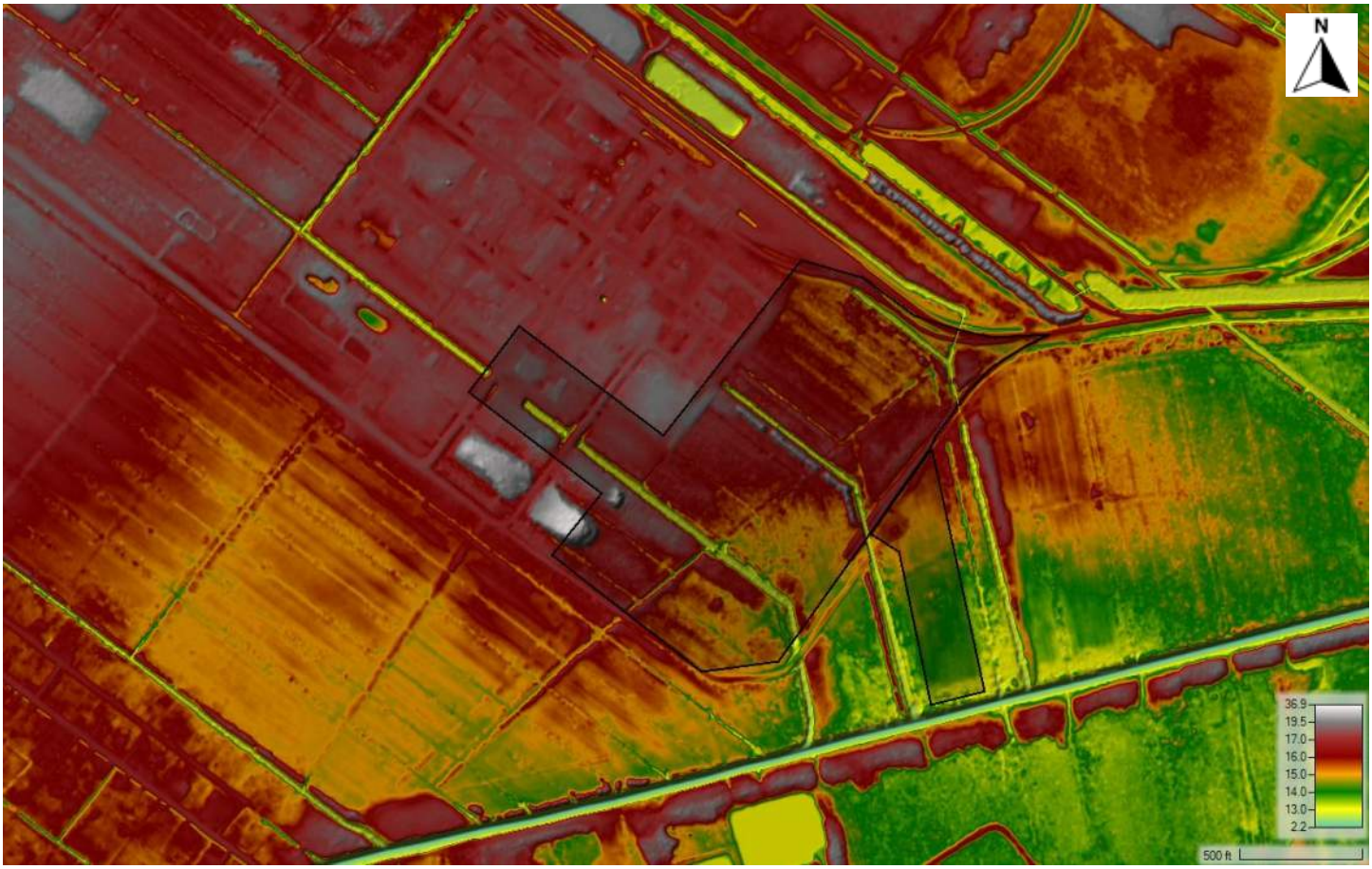


Figure 1:Existing Terrain LiDAR

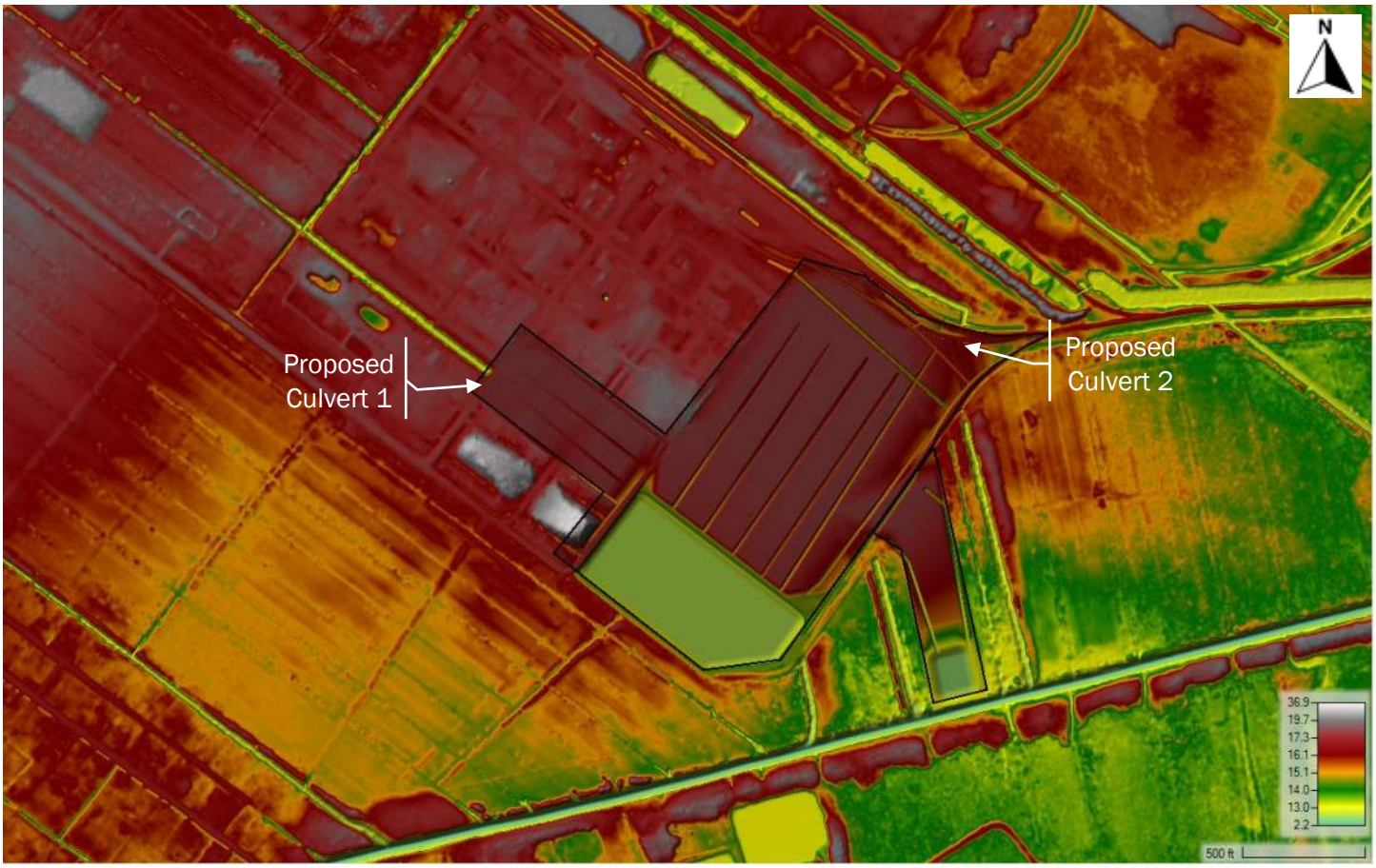


Figure 2: ***Proposed Terrain LiDAR***

With the 100-year design storm event was simulated from the pre-development and Post-Development Hydraulic Models, the peak water surface elevations were extracted compared to one another, as shown in Figure 3.

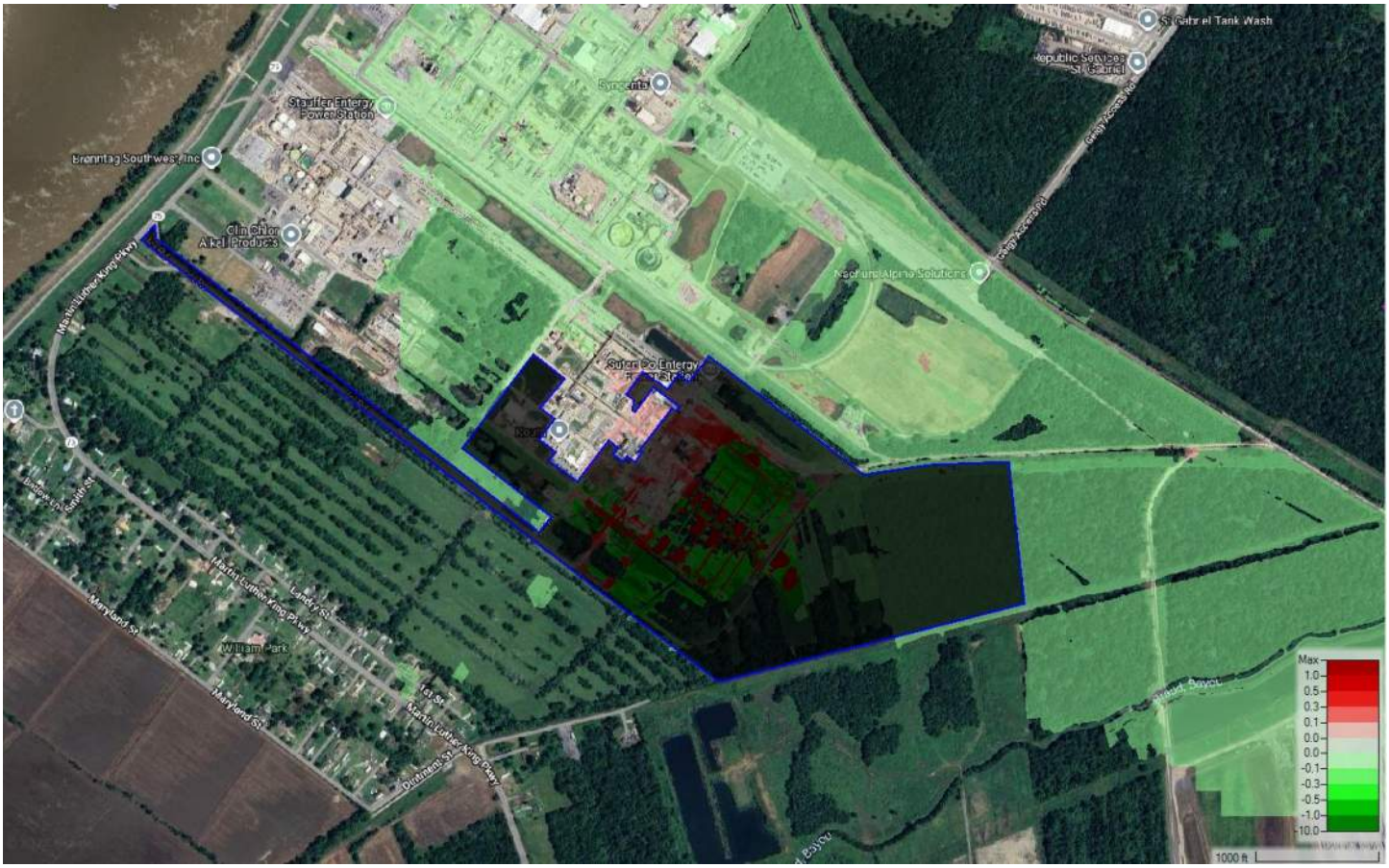


Figure 3: 100-YR WSE Differences

**This figure is not the final version, as the email we got today from Koura confirmed that the property boundary will remain the same as the blue polygon, we are cleaning the light increase area west of the property line.*

The comparisons reveal no impact on Peak WSE beyond the development site for the 100-year storm event.

7. Flood Zone Fill Mitigation

The site is located in Flood Zone "A" and partially within Zone "X" on the effective FIRM Panel Map Number 22047C0355D last revised November 6, 2013 (see **Exhibit 2** for FEMA FIRM map). Fill mitigation will not be needed to mitigate reduction of floodplain volumes from pre-developed to post-developed conditions, as there is currently no fill planned to be placed within Flood Zone "A".

9. Summary and Conclusions

In summary, the proposed site was analyzed as two (2) on-site drainage areas. Proposed developed areas A1 and A2 will utilize subsurface drainage networks and ditches / swales to convey runoff to the proposed ponds A1 and A2. Pond A1 outfalls to an existing ditch which drains south to the existing Iberville Parish drainage lateral at the southern property line. Pond A2 will outfall directly into the existing Iberville Parish drainage lateral. The existing Iberville Parish drainage lateral flows east to Bayou Braud, then flows north to Bayou Paul. The proposed detention

ponds are utilized to limit the post-developed runoff rate (based on the 100-year storm event) to the pre-developed runoff rate (based on the 10-year storm event). The proposed ponds will also contain the 100-year storm event volume from each drainage area, without any outflow from the ponds. Limiting the post-development runoff rate to the pre-development runoff rate will result in no change to the downstream water surface elevation. This study has been prepared to comply the city of St. Gabriel's Flood Prevention Ordinances as well as Article 6 of the Iberville Parish Code of Ordinances.

EXHIBITS

- Exhibit 1 Vicinity Map
- Exhibit 2 FEMA FIRM Map
- Exhibit 3 Regional Drainage Area Map
- Exhibit 4 Existing Drainage Conditions Map
- Exhibit 5 Proposed Drainage Conditions Map

APPENDICES

- Appendix 1 Pre vs. Post Conditions Hydraflow Hydrographs Analysis (10-year and 100-year Storm Events)
- Appendix 2 USDA NRCS Soils Report

EXHIBIT 1

VICINITY MAP

VICINITY MAP

Koura Industrial Park - Vicinity Map

Iberville Parish, Louisiana | August 2025

PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

N

Vicinity Map
SCALE: 1"= 2000'
0 2000' 4000' 6000'

CSRS | BUILDING STRONGER, SMARTER COMMUNITIES TOGETHER.
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

EXHIBIT 2

FEMA FIRM MAP

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 updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot 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 FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 Louisiana State Plane south zone (FIPSZONE 1702). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State 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 the 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 ground 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 Services
NOAA, N/NGS12
National Geodetic Survey
SSMC–3, #9202
1315 East–West Highway
Silver Spring, MD 20910–3282

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) 713–3242,** or visit its website at http://www.ngs.noaa.gov/.

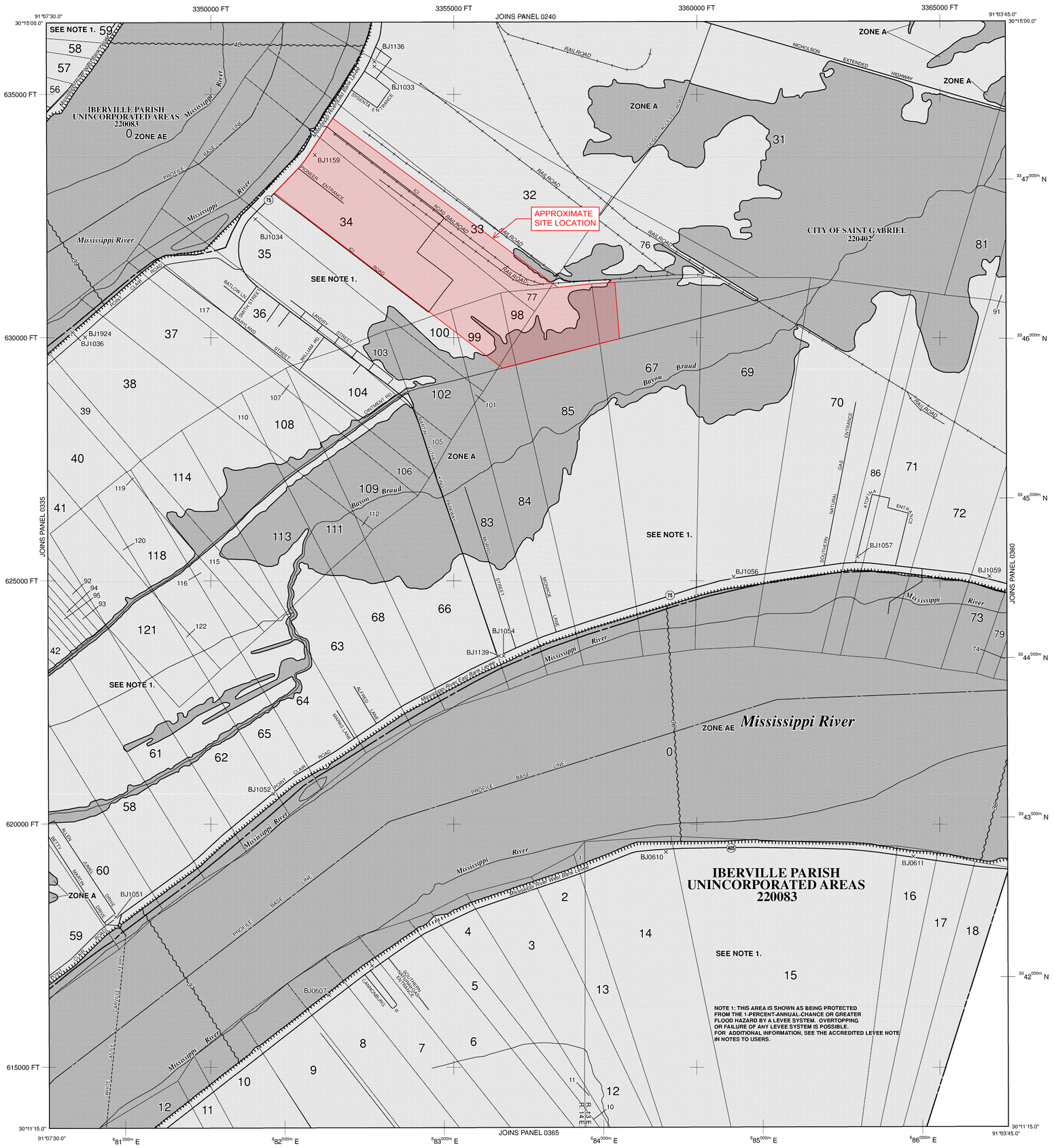
Base map information shown on this FIRM was obtained from the United States Geological Survey, the National Geodetic Survey, the Federal Emergency Management Agency, the Louisiana Oil Spill Coordinator's Office, Louisiana Department of Transportation and Development and from Iberville Parish.
This map may reflect more detailed or up to date stream channel configurations than those shown on the previous FIRM. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations and improved topographic data. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in theFIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

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 separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the **FEMA Map Service Center** website at http://msc.fema.gov. Available products may include previously issued Letters ofMap Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the **FEMA Map Service Center** website or by calling the FEMA Map Information eXchange.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1–percent–annual–chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

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.

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A — Cross section line

23 — 23 — Transect line

97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15

6000000 FT — 5000-foot grid ticks: Louisiana State Plane coordinate system, south zone (FIPSZONE 1702), Lambert Conformal Conic

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 6, 2013
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1–800–638–6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0355D

FIRM

FLOOD INSURANCE RATE MAP

IBERVILLE PARISH, LOUISIANA

AND INCORPORATED AREAS

PANEL 355 OF 475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
IBERVILLE PARISH UNINCORPORATED AREAS	220083	0355	D
ST. GABRIEL, CITY OF	220402	0355	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
22047C0355D

EFFECTIVE DATE
NOVEMBER 6, 2013

Federal Emergency Management Agency

EXHIBIT 3

REGIONAL DRAINAGE AREA MAP

EXHIBIT 4

EXISTING DRAINAGE CONDITIONS MAP

EXISTING DRAINAGE CONDITIONS

DRAINAGE AREA DATA TABLE					
DRAINAGE AREA	AREA (AC)	WEIGHTED CURVE NUMBER	TIME OF CONCENTRATION (MIN)	10-YR PEAK FLOW (CFS)	100-YR PEAK FLOW (CFS)
A	44.861	76	106.6	76.27	125.90

SYMBOL	DESCRIPTION
A	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY
30	EXIST. CONTOUR
	FLOW ARROW
	EXIST. DITCH
	HYDRAULIC LENGTH
	PROPERTY LINE
	FLOOD ZONE "A"

PROPERTY LINE
LIMITS OF DEVELOPMENT
PROPERTY LINE
PROPERTY LINE
ZONE "X"
ZONE "A"
A
EX. 51"x66" CMPA
EX. 36"x58" CMPA
EX. 24" CMP
EX. (2) 48" CMP
EX. (2) 48" CMP
ZONE "X"
ZONE "A"
ZONE "X"
ZONE "A"
SITE OUTFALL #1
Q_{10} = 76.27 C.F.S.
Q_{100} = 125.90 C.F.S.

Koura Industrial Park - Existing Drainage Conditions

Iberville Parish, Louisiana | August 2025

PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

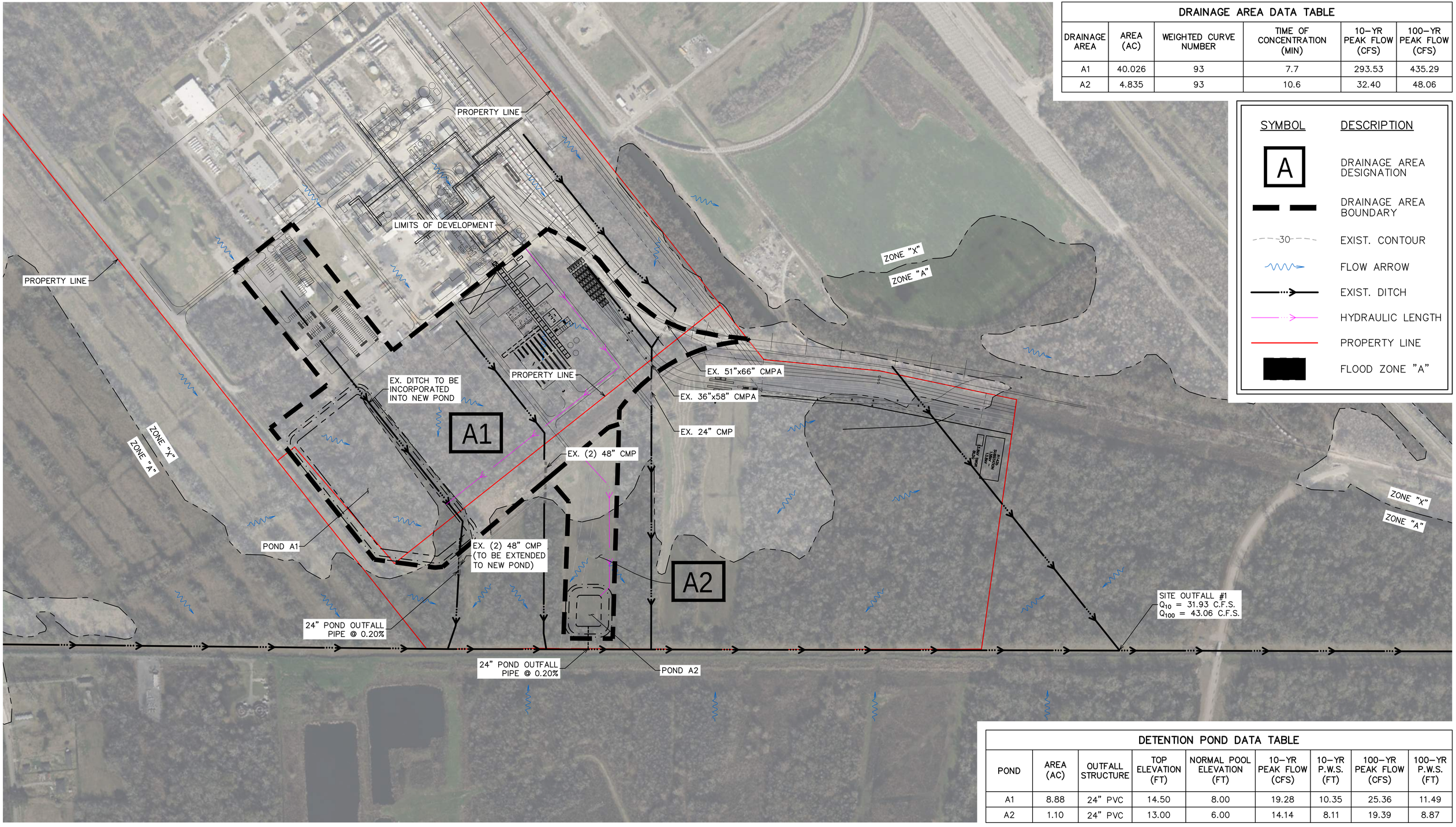
Existing Drainage Conditions
SCALE: 1"= 200'
0 200' 400' 600'

CSRS | BUILDING STRONGER, SMARTER COMMUNITIES TOGETHER.
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

EXHIBIT 5

PROPOSED DRAINAGE CONDITIONS MAP

PROPOSED DRAINAGE CONDITIONS



DRAINAGE AREA DATA TABLE

DRAINAGE AREA	AREA (AC)	WEIGHTED CURVE NUMBER	TIME OF CONCENTRATION (MIN)	10-YR PEAK FLOW (CFS)	100-YR PEAK FLOW (CFS)
A1	40.026	93	7.7	293.53	435.29
A2	4.835	93	10.6	32.40	48.06

SYMBOL	DESCRIPTION
A	DRAINAGE AREA DESIGNATION
	DRAINAGE AREA BOUNDARY
30	EXIST. CONTOUR
	FLOW ARROW
	EXIST. DITCH
	HYDRAULIC LENGTH
	PROPERTY LINE
	FLOOD ZONE "A"

DETENTION POND DATA TABLE

POND	AREA (AC)	OUTFALL STRUCTURE	TOP ELEVATION (FT)	NORMAL POOL ELEVATION (FT)	10-YR PEAK FLOW (CFS)	10-YR P.W.S. (FT)	100-YR PEAK FLOW (CFS)	100-YR P.W.S. (FT)
A1	8.88	24" PVC	14.50	8.00	19.28	10.35	25.36	11.49
A2	1.10	24" PVC	13.00	6.00	14.14	8.11	19.39	8.87

Koura Industrial Park - Proposed Drainage Conditions

Iberville Parish, Louisiana | August 2025

PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

Proposed Drainage Conditions
SCALE: 1"= 200'
0 200' 400' 600'

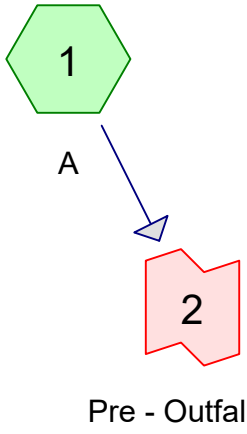
CSRS | BUILDING STRONGER, SMARTER COMMUNITIES TOGETHER.
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

APPENDIX 1

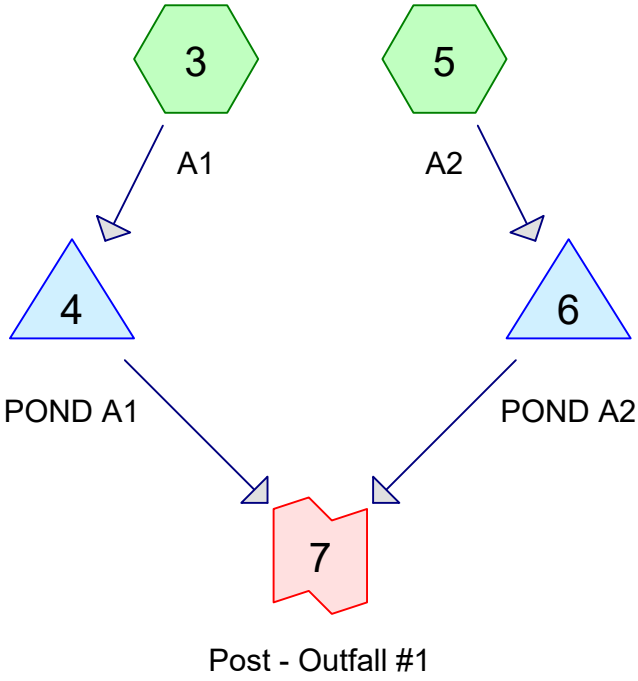
PRE VS. POST CONDITIONS HYDRAFLOW HYDROGRAPHS ANALYSIS

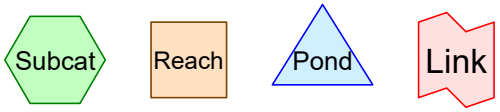
(10-YEAR AND 100-YEAR STORM EVENTS)

Pre - Development



Post - Development





Routing Diagram for Koura Industrial Park - DIS Pre to Post Mode
Prepared by CSRS, a Westwood company

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.001	79	Pasture/grassland/range, Fair, HSG C (1)
5.744	91	Urban industrial, 72% imp, HSG C (1)
44.861	93	Urban industrial, 72% imp, HSG D (3, 5)
34.116	73	Woods, Fair, HSG C (1)
89.722	**84**	**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: A Runoff Area=44.861 ac 9.22% Impervious Runoff Depth>4.84"
Flow Length=1,828' Tc=106.6 min CN=76 Runoff=76.27 cfs 18.099 af

Link 2: Pre - Outfall #1 Inflow=76.27 cfs 18.099 af
Primary=76.27 cfs 18.099 af

Subcatchment 3: A1 Runoff Area=40.026 ac 72.00% Impervious Runoff Depth>6.92"
Flow Length=1,711' Tc=7.7 min CN=93 Runoff=293.53 cfs 23.071 af

Pond 4: POND A1 Peak Elev=10.35' Storage=677,322 cf Inflow=293.53 cfs 23.071 af
24.0" Round Culvert n=0.009 L=170.0' S=0.0044 '/' Outflow=19.28 cfs 11.779 af

Subcatchment 5: A2 Runoff Area=4.835 ac 72.00% Impervious Runoff Depth>6.91"
Flow Length=727' Tc=10.6 min CN=93 Runoff=32.40 cfs 2.786 af

Pond 6: POND A2 Peak Elev=8.11' Storage=39,653 cf Inflow=32.40 cfs 2.786 af
24.0" Round Culvert n=0.009 L=102.0' S=0.0020 '/' Outflow=14.14 cfs 2.643 af

Link 7: Post - Outfall #1 Inflow=31.93 cfs 14.422 af
Primary=31.93 cfs 14.422 af

Total Runoff Area = 89.722 ac Runoff Volume = 43.956 af Average Runoff Depth = 5.88"
59.39% Pervious = 53.286 ac 40.61% Impervious = 36.436 ac

Summary for Subcatchment 1: A

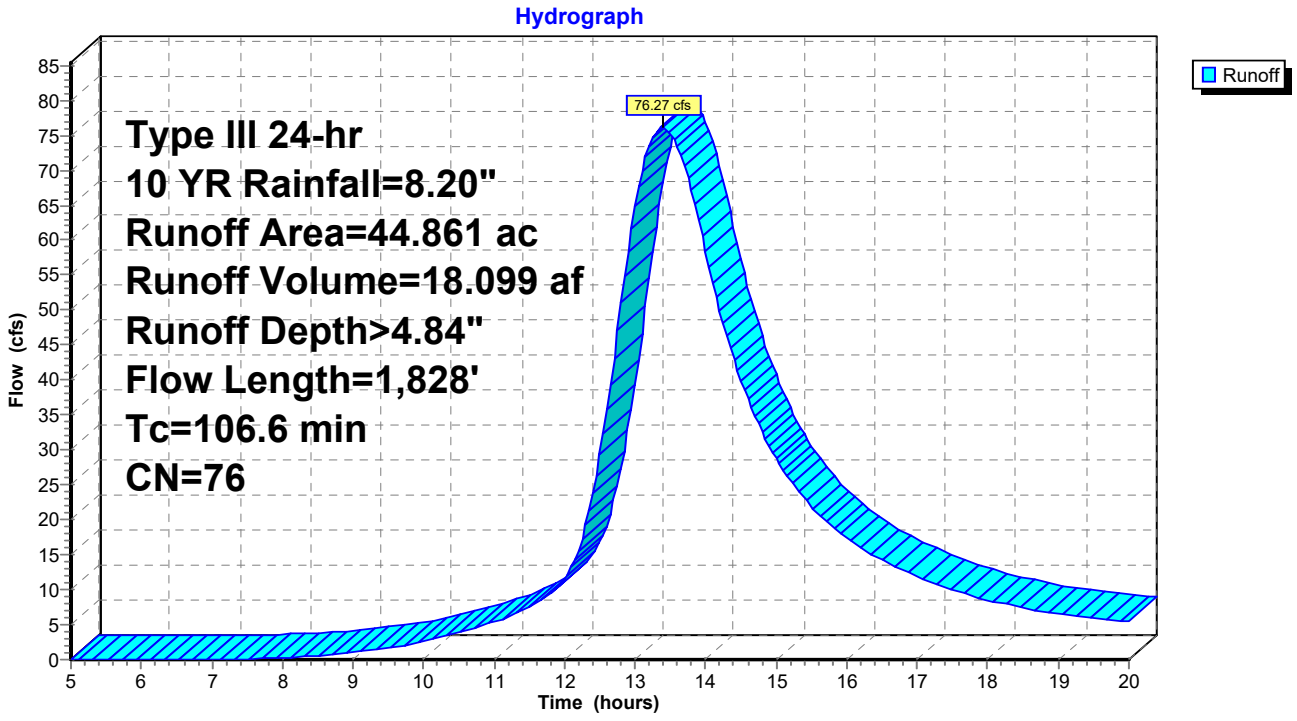
Runoff = 76.27 cfs @ 13.39 hrs, Volume= 18.099 af, Depth> 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=8.20"

Area (ac)	CN	Description
5.744	91	Urban industrial, 72% imp, HSG C
34.116	73	Woods, Fair, HSG C
5.001	79	Pasture/grassland/range, Fair, HSG C
44.861	76	Weighted Average
40.725		90.78% Pervious Area
4.136		9.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.4	164	0.0010	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.80"
6.3	178	0.0010	0.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
60.9	1,486	0.0020	0.41	33.32	**Channel Flow,** Area= 82.0 sf Perim= 33.0' r= 2.48' n= 0.300
106.6	1,828	Total			

Subcatchment 1: A

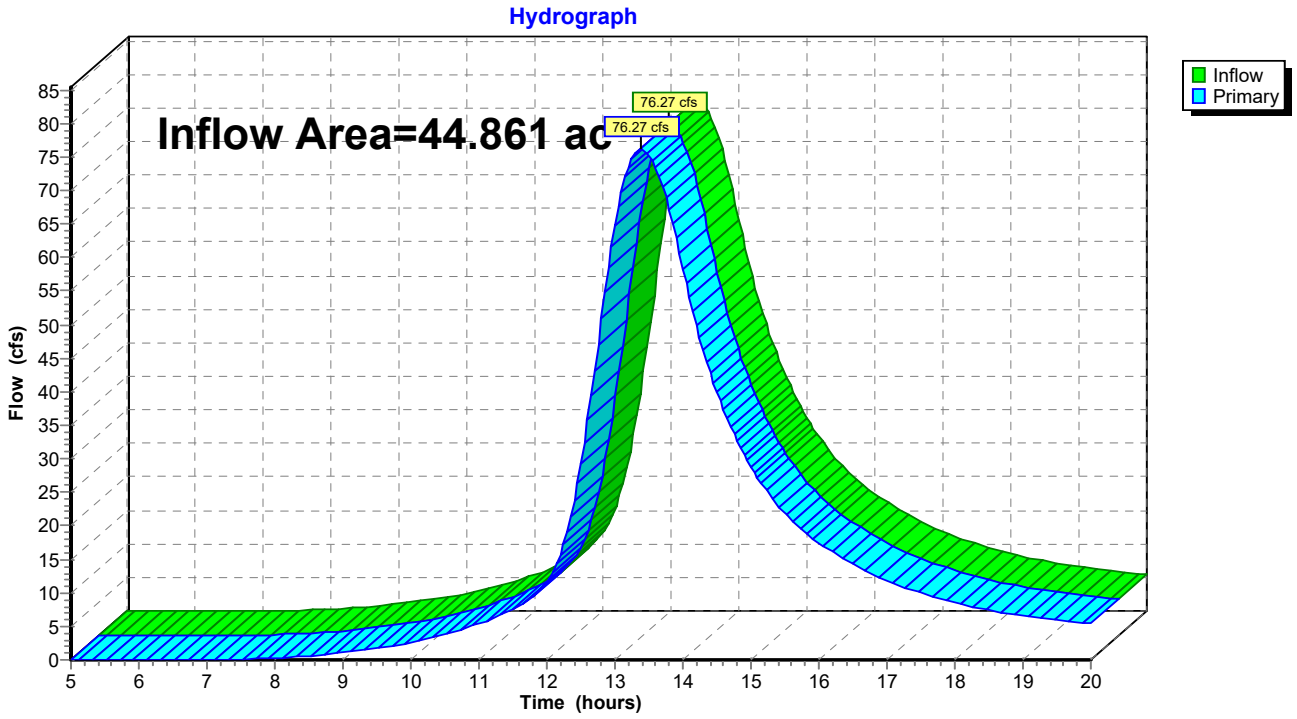


Summary for Link 2: Pre - Outfall #1

Inflow Area = 44.861 ac, 9.22% Impervious, Inflow Depth > 4.84" for 10 YR event
Inflow = 76.27 cfs @ 13.39 hrs, Volume= 18.099 af
Primary = 76.27 cfs @ 13.39 hrs, Volume= 18.099 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2: Pre - Outfall #1



Summary for Subcatchment 3: A1

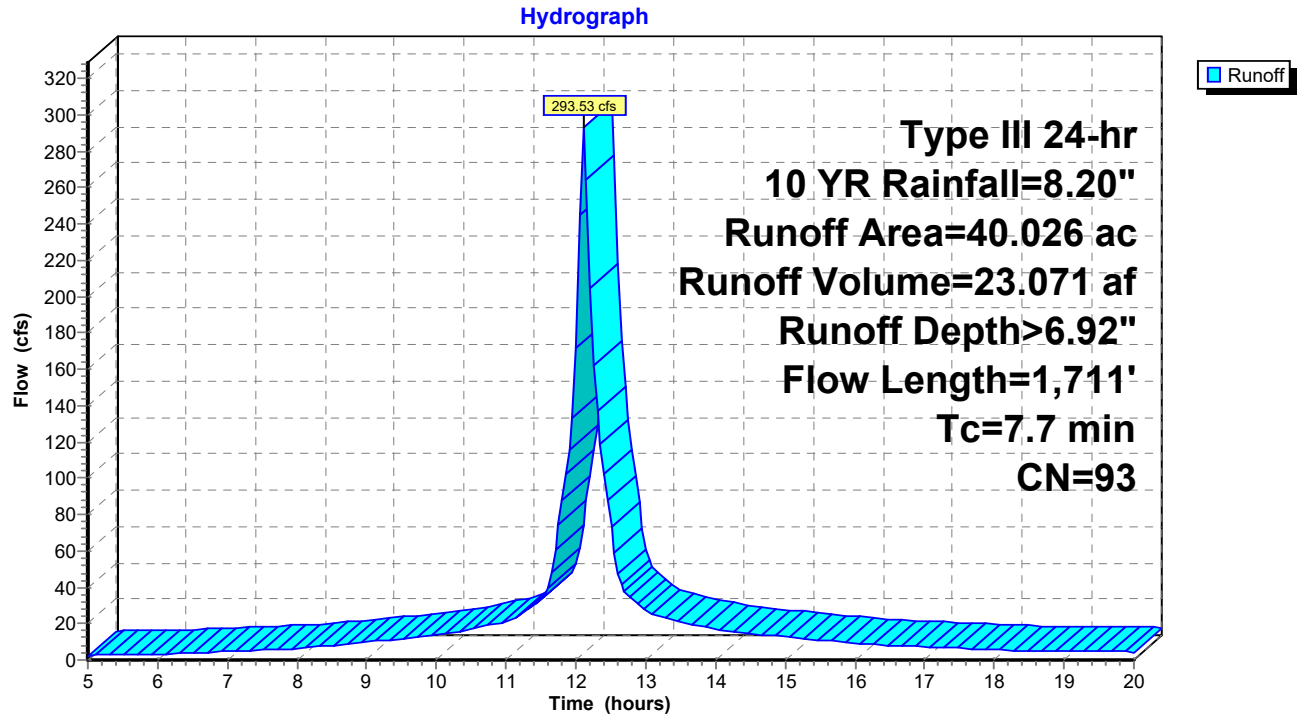
Runoff = 293.53 cfs @ 12.11 hrs, Volume= 23.071 af, Depth> 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=8.20"

Area (ac)	CN	Description
40.026	93	Urban industrial, 72% imp, HSG D
11.207		28.00% Pervious Area
28.819		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	200	0.0100	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.80"
5.4	1,511	0.0020	4.65	14.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.009 PVC, smooth interior
7.7	1,711	Total			

Subcatchment 3: A1



Summary for Pond 4: POND A1

Inflow Area = 40.026 ac, 72.00% Impervious, Inflow Depth > 6.92" for 10 YR event
Inflow = 293.53 cfs @ 12.11 hrs, Volume= 23.071 af
Outflow = 19.28 cfs @ 13.71 hrs, Volume= 11.779 af, Atten= 93%, Lag= 96.0 min
Primary = 19.28 cfs @ 13.71 hrs, Volume= 11.779 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 10.35' @ 13.71 hrs Surf.Area= 301,617 sf Storage= 677,322 cf

Plug-Flow detention time=284.0 min calculated for 11.775 af (51% of inflow)
Center-of-Mass det. time=193.1 min (937.3 - 744.2)

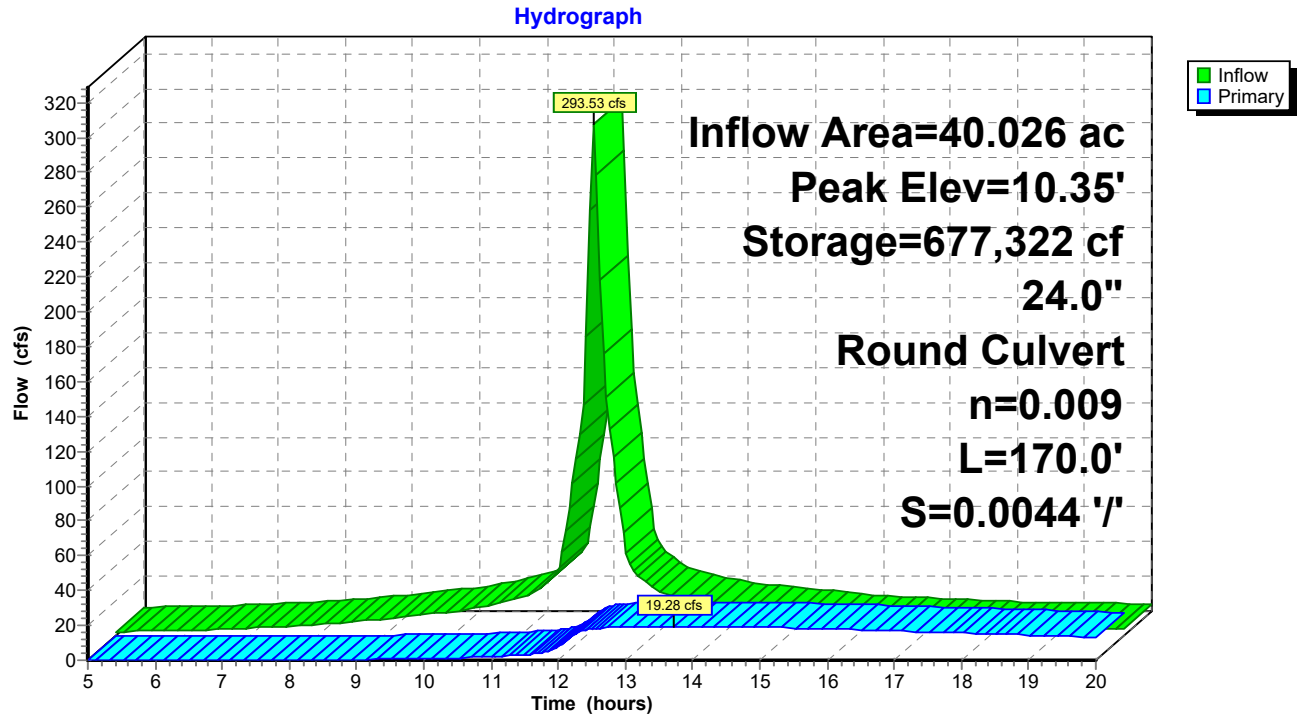
Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	2,028,088 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	274,396	0	0
14.50	349,631	2,028,088	2,028,088

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**24.0" Round Culvert** L= 170.0' Ke= 0.200 Inlet / Outlet Invert= 8.00' / 7.25' S= 0.0044 '/' Cc= 0.900 n= 0.009 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=19.28 cfs @ 13.71 hrs HW=10.35' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 19.28 cfs @ 6.57 fps)

Pond 4: POND A1



Summary for Subcatchment 5: A2

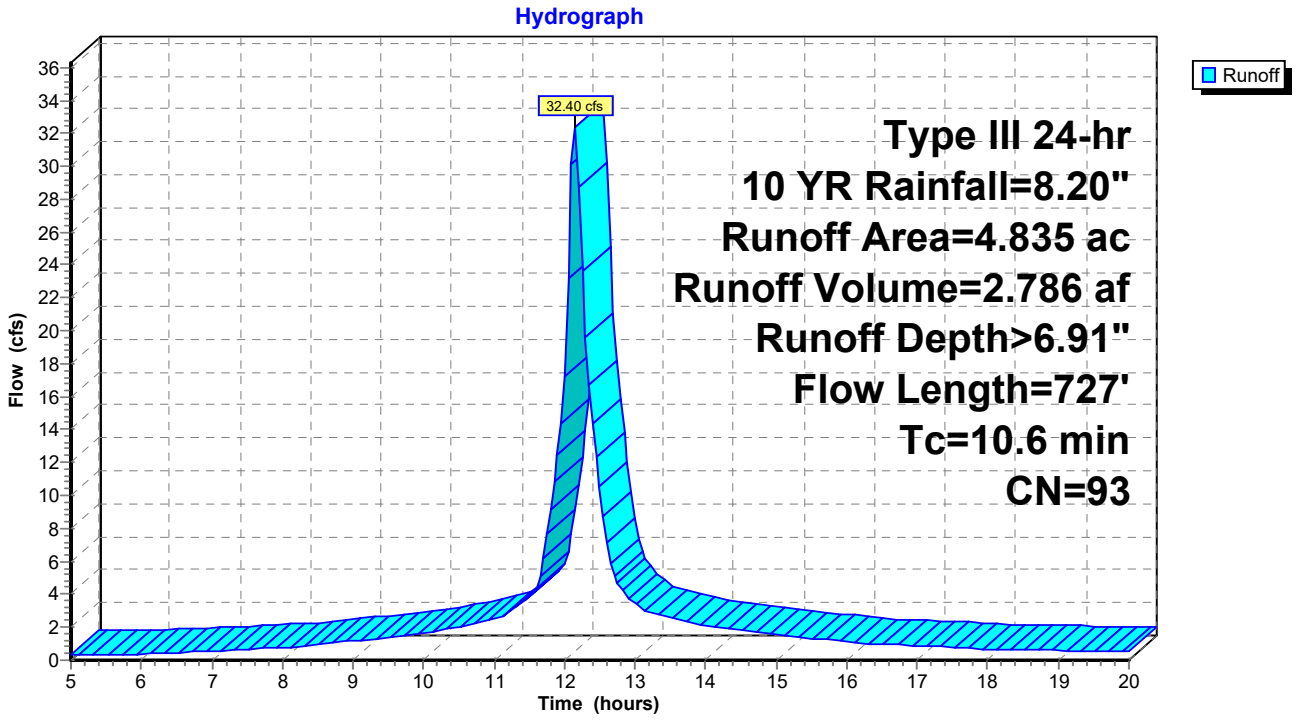
Runoff = 32.40 cfs @ 12.14 hrs, Volume= 2.786 af, Depth> 6.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=8.20"

Area (ac)	CN	Description
4.835	93	Urban industrial, 72% imp, HSG D
1.354		28.00% Pervious Area
3.481		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	200	0.0100	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.80"
8.3	527	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.6	727	Total			

Subcatchment 5: A2



Summary for Pond 6: POND A2

Inflow Area = 4.835 ac, 72.00% Impervious, Inflow Depth > 6.91" for 10 YR event
Inflow = 32.40 cfs @ 12.14 hrs, Volume= 2.786 af
Outflow = 14.14 cfs @ 12.41 hrs, Volume= 2.643 af, Atten= 56%, Lag= 15.9 min
Primary = 14.14 cfs @ 12.41 hrs, Volume= 2.643 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 8.11' @ 12.41 hrs Surf.Area= 21,976 sf Storage= 39,653 cf

Plug-Flow detention time=74.5 min calculated for 2.642 af (95% of inflow)
Center-of-Mass det. time=54.6 min (801.0 - 746.4)

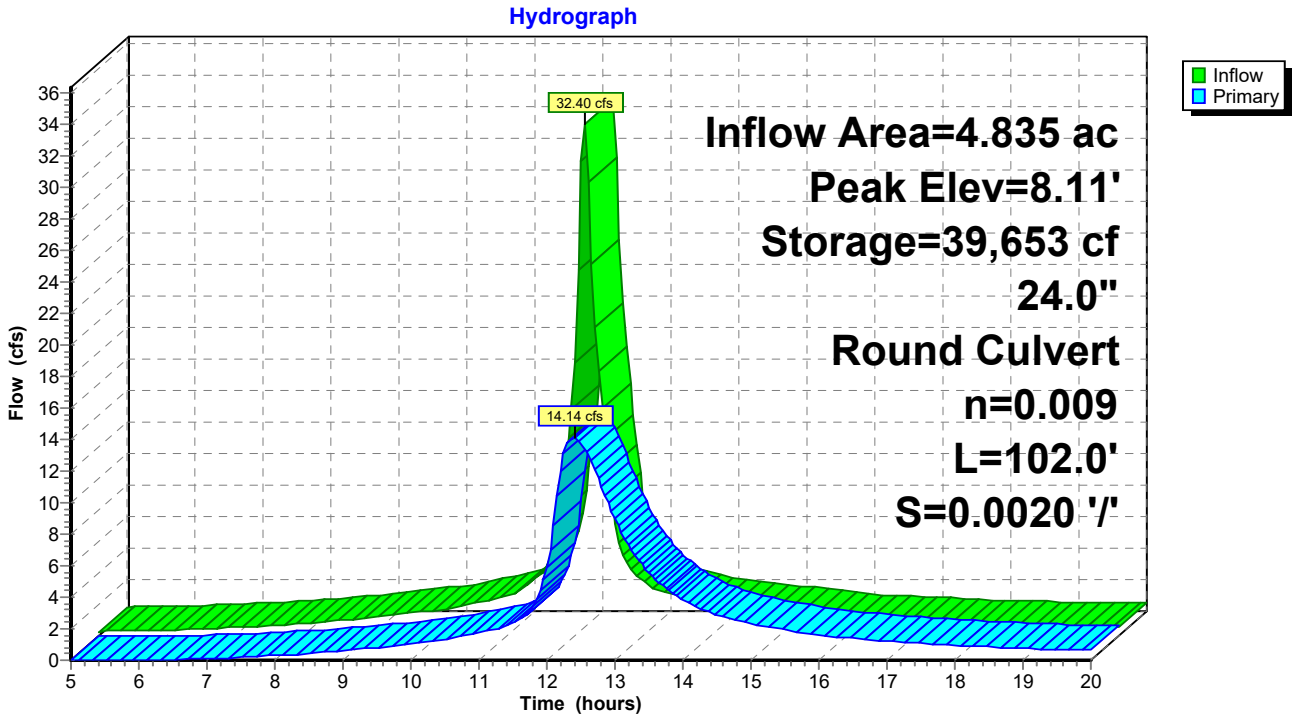
Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	183,257 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	15,583	0	0
13.00	36,776	183,257	183,257

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**24.0" Round Culvert** L= 102.0' Ke= 0.200 Inlet / Outlet Invert= 6.00' / 5.80' S= 0.0020 '/' Cc= 0.900 n= 0.009 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=14.13 cfs @ 12.41 hrs HW=8.11' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 14.13 cfs @ 5.30 fps)

Pond 6: POND A2

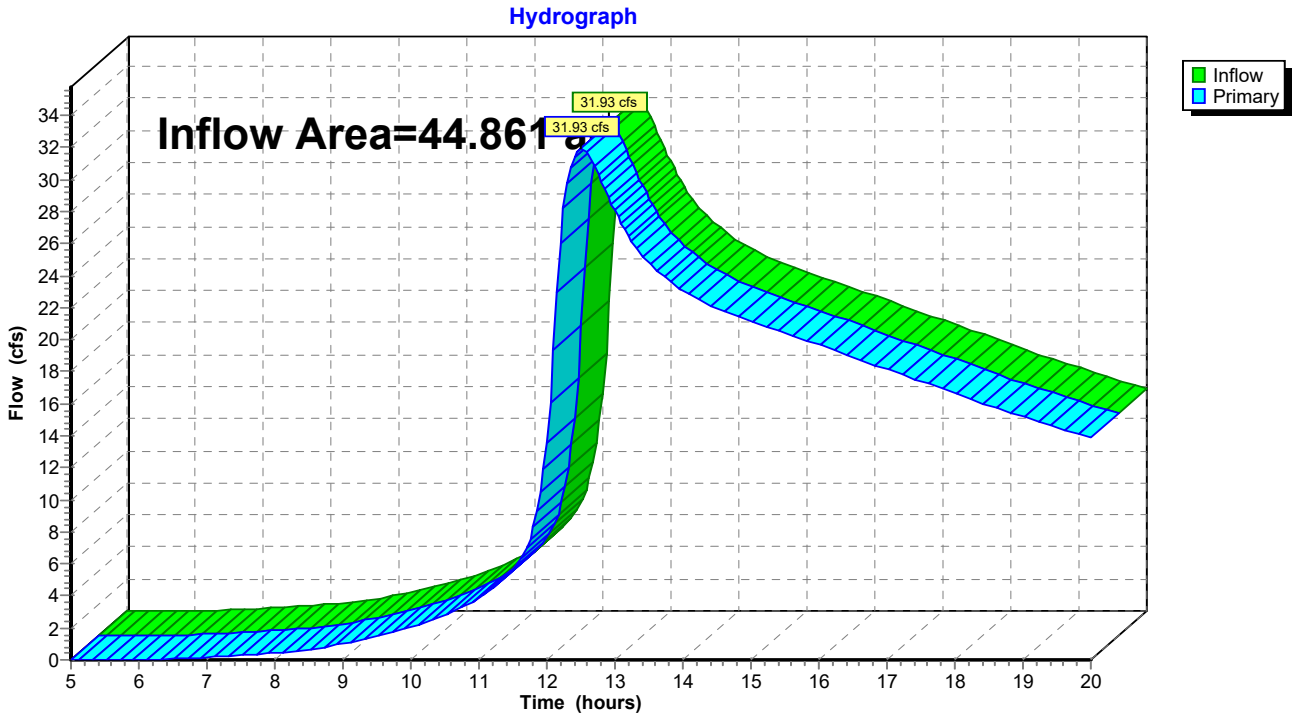


Summary for Link 7: Post - Outfall #1

Inflow Area = 44.861 ac, 72.00% Impervious, Inflow Depth > 3.86" for 10 YR event
Inflow = 31.93 cfs @ 12.51 hrs, Volume= 14.422 af
Primary = 31.93 cfs @ 12.51 hrs, Volume= 14.422 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 7: Post - Outfall #1



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: A Runoff Area=44.861 ac 9.22% Impervious Runoff Depth>8.13"
Flow Length=1,828' Tc=106.6 min CN=76 Runoff=125.90 cfs 30.407 af

Link 2: Pre - Outfall #1 Inflow=125.90 cfs 30.407 af
Primary=125.90 cfs 30.407 af

Subcatchment 3: A1 Runoff Area=40.026 ac 72.00% Impervious Runoff Depth>10.41"
Flow Length=1,711' Tc=7.7 min CN=93 Runoff=435.29 cfs 34.722 af

Pond 4: POND A1 Peak Elev=11.49' Storage=1,028,494 cf Inflow=435.29 cfs 34.722 af
24.0" Round Culvert n=0.009 L=170.0' S=0.0044 '/' Outflow=25.36 cfs 16.757 af

Subcatchment 5: A2 Runoff Area=4.835 ac 72.00% Impervious Runoff Depth>10.41"
Flow Length=727' Tc=10.6 min CN=93 Runoff=48.06 cfs 4.193 af

Pond 6: POND A2 Peak Elev=8.87' Storage=57,210 cf Inflow=48.06 cfs 4.193 af
24.0" Round Culvert n=0.009 L=102.0' S=0.0020 '/' Outflow=19.39 cfs 4.022 af

Link 7: Post - Outfall #1 Inflow=43.06 cfs 20.779 af
Primary=43.06 cfs 20.779 af

Total Runoff Area = 89.722 ac Runoff Volume = 69.322 af Average Runoff Depth = 9.27"
59.39% Pervious = 53.286 ac 40.61% Impervious = 36.436 ac

Summary for Subcatchment 1: A

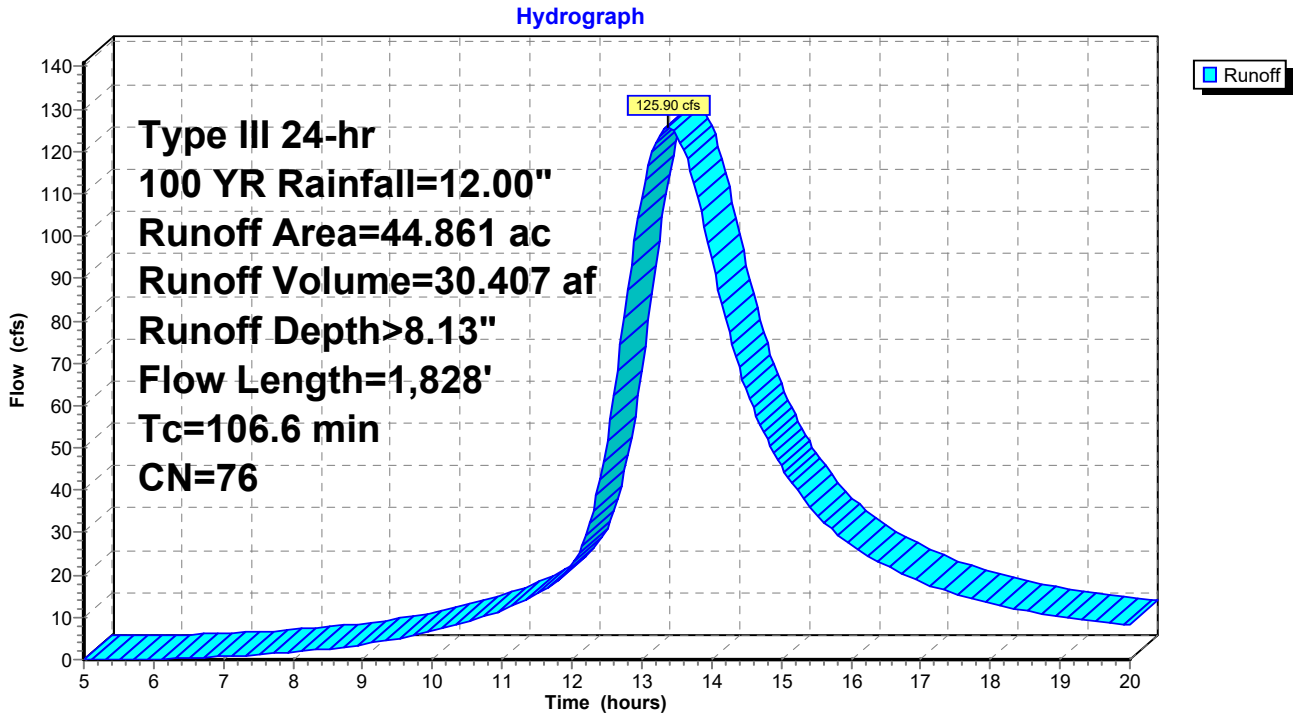
Runoff = 125.90 cfs @ 13.38 hrs, Volume= 30.407 af, Depth> 8.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=12.00"

Area (ac)	CN	Description
5.744	91	Urban industrial, 72% imp, HSG C
34.116	73	Woods, Fair, HSG C
5.001	79	Pasture/grassland/range, Fair, HSG C
44.861	76	Weighted Average
40.725		90.78% Pervious Area
4.136		9.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.4	164	0.0010	0.07		**Sheet Flow,** Grass: Short n= 0.150 P2= 4.80"
6.3	178	0.0010	0.47		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
60.9	1,486	0.0020	0.41	33.32	**Channel Flow,** Area= 82.0 sf Perim= 33.0' r= 2.48' n= 0.300
106.6	1,828	Total			

Subcatchment 1: A

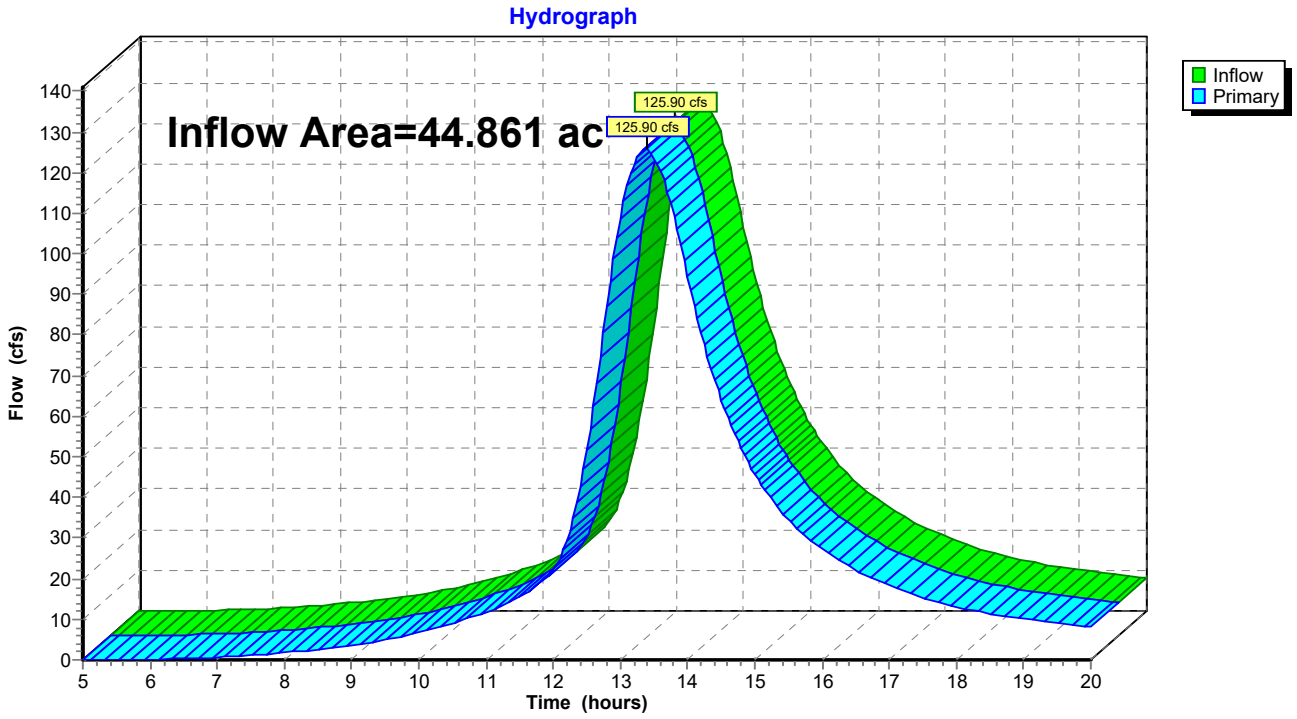


Summary for Link 2: Pre - Outfall #1

Inflow Area = 44.861 ac, 9.22% Impervious, Inflow Depth > 8.13" for 100 YR event
Inflow = 125.90 cfs @ 13.38 hrs, Volume= 30.407 af
Primary = 125.90 cfs @ 13.38 hrs, Volume= 30.407 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2: Pre - Outfall #1



Summary for Subcatchment 3: A1

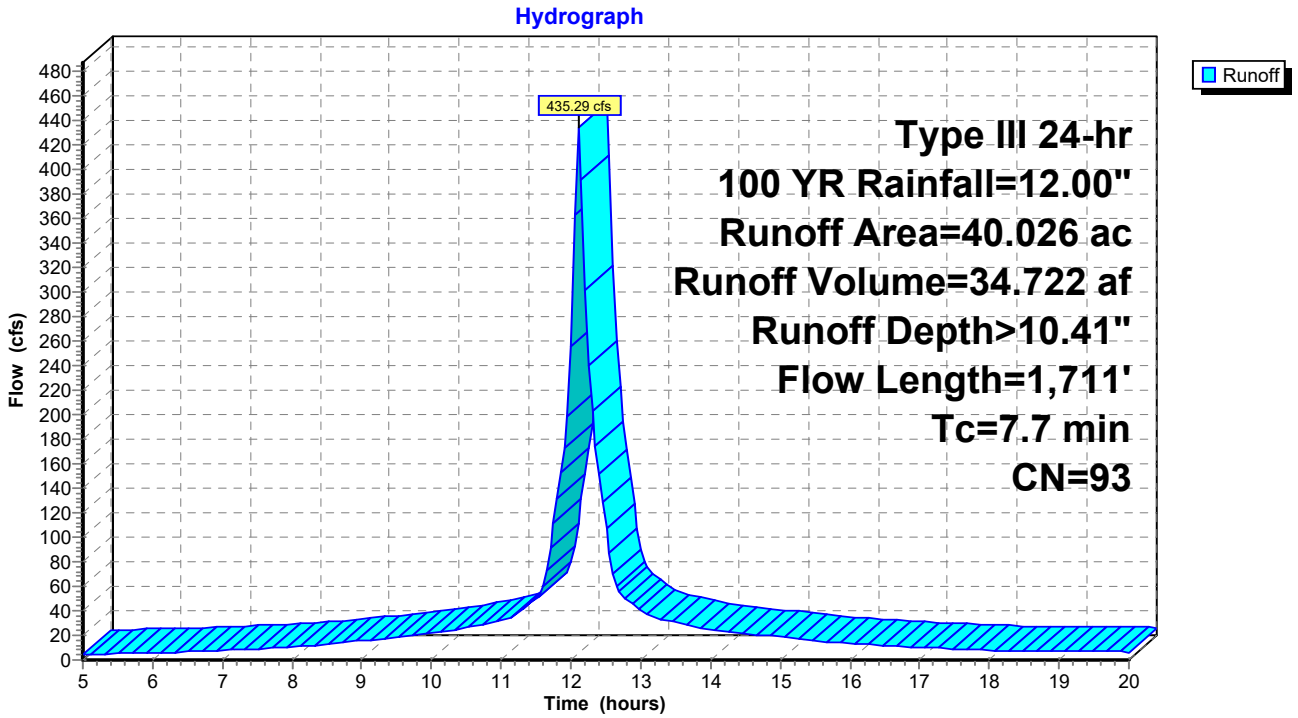
Runoff = 435.29 cfs @ 12.11 hrs, Volume= 34.722 af, Depth>10.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=12.00"

Area (ac)	CN	Description
40.026	93	Urban industrial, 72% imp, HSG D
11.207		28.00% Pervious Area
28.819		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	200	0.0100	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.80"
5.4	1,511	0.0020	4.65	14.61	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.009 PVC, smooth interior
7.7	1,711	Total			

Subcatchment 3: A1



Summary for Pond 4: POND A1

Inflow Area = 40.026 ac, 72.00% Impervious, Inflow Depth > 10.41" for 100 YR event
Inflow = 435.29 cfs @ 12.11 hrs, Volume= 34.722 af
Outflow = 25.36 cfs @ 13.97 hrs, Volume= 16.757 af, Atten= 94%, Lag= 111.7 min
Primary = 25.36 cfs @ 13.97 hrs, Volume= 16.757 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 11.49' @ 13.97 hrs Surf.Area= 314,805 sf Storage= 1,028,494 cf

Plug-Flow detention time=292.3 min calculated for 16.748 af (48% of inflow)
Center-of-Mass det. time=194.7 min (934.4 - 739.7)

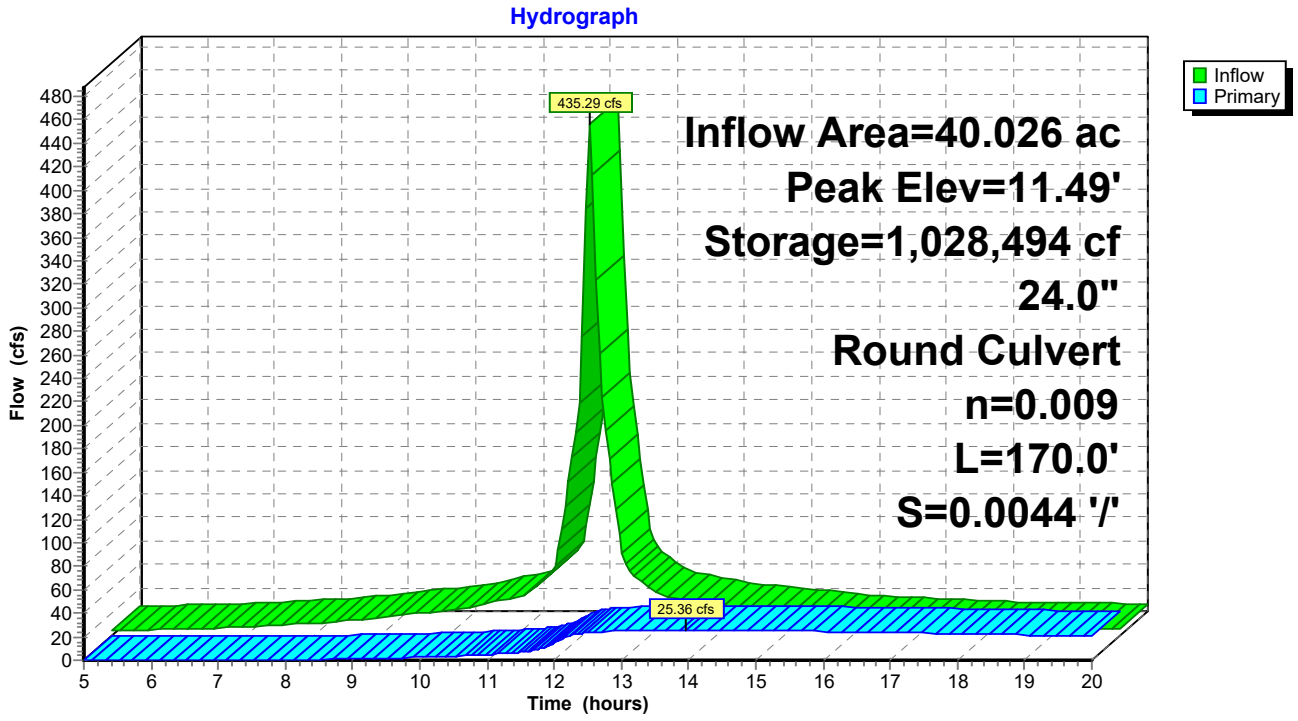
Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	2,028,088 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	274,396	0	0
14.50	349,631	2,028,088	2,028,088

Device	Routing	Invert	Outlet Devices
#1	Primary	8.00'	**24.0" Round Culvert** L= 170.0' Ke= 0.200 Inlet / Outlet Invert= 8.00' / 7.25' S= 0.0044 '/' Cc= 0.900 n= 0.009 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=25.36 cfs @ 13.97 hrs HW=11.49' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 25.36 cfs @ 8.07 fps)

Pond 4: POND A1



Summary for Subcatchment 5: A2

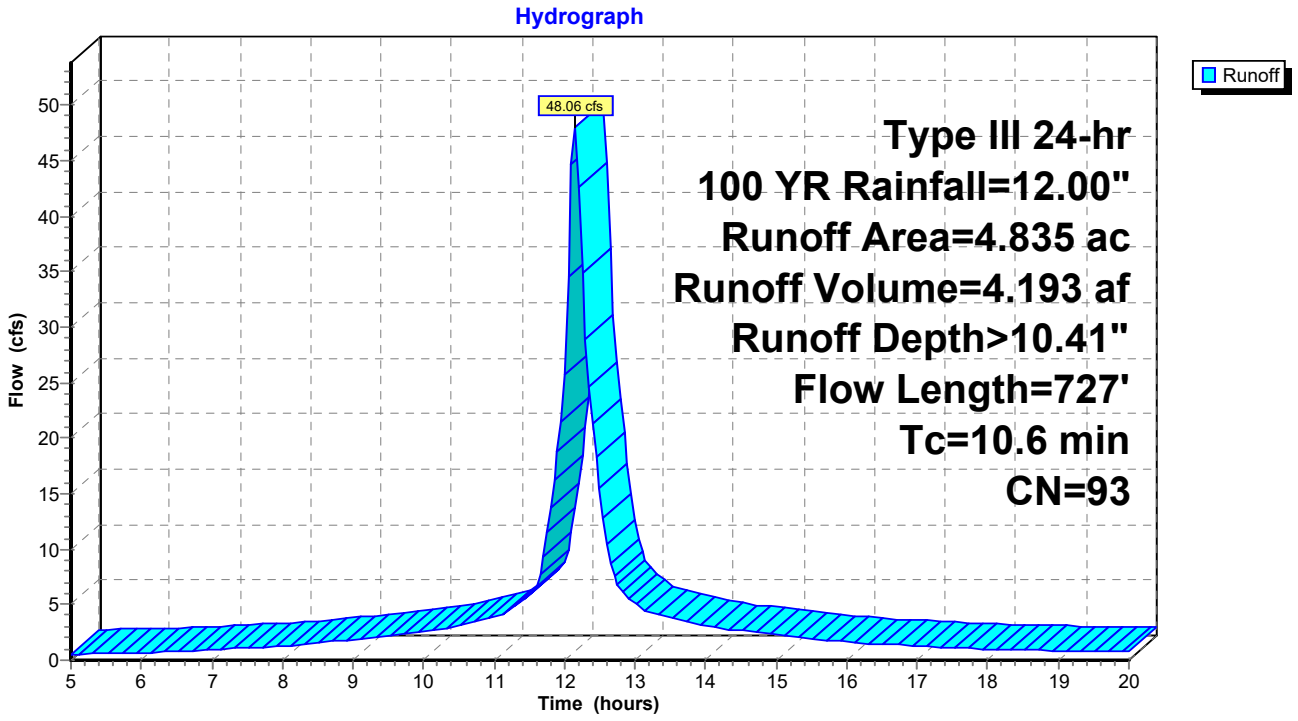
Runoff = 48.06 cfs @ 12.14 hrs, Volume= 4.193 af, Depth>10.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=12.00"

Area (ac)	CN	Description
4.835	93	Urban industrial, 72% imp, HSG D
1.354		28.00% Pervious Area
3.481		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	200	0.0100	1.47		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 4.80"
8.3	527	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
10.6	727	Total			

Subcatchment 5: A2



Summary for Pond 6: POND A2

Inflow Area = 4.835 ac, 72.00% Impervious, Inflow Depth > 10.41" for 100 YR event
Inflow = 48.06 cfs @ 12.14 hrs, Volume= 4.193 af
Outflow = 19.39 cfs @ 12.43 hrs, Volume= 4.022 af, Atten= 60%, Lag= 17.3 min
Primary = 19.39 cfs @ 12.43 hrs, Volume= 4.022 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 8.87' @ 12.43 hrs Surf.Area= 24,274 sf Storage= 57,210 cf

Plug-Flow detention time=66.3 min calculated for 4.008 af (96% of inflow)
Center-of-Mass det. time=50.0 min (791.8 - 741.8)

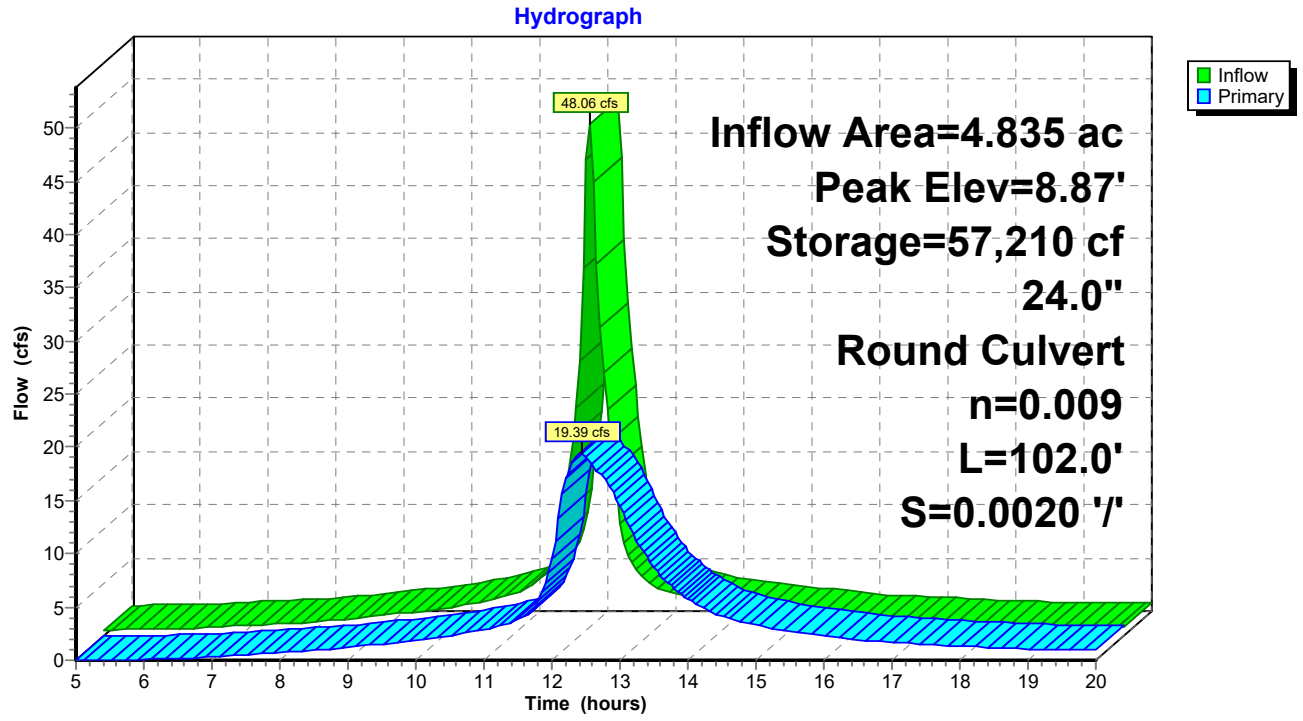
Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	183,257 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	15,583	0	0
13.00	36,776	183,257	183,257

Device	Routing	Invert	Outlet Devices
#1	Primary	6.00'	**24.0" Round Culvert** L= 102.0' Ke= 0.200 Inlet / Outlet Invert= 6.00' / 5.80' S= 0.0020 '/' Cc= 0.900 n= 0.009 PVC, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=19.37 cfs @ 12.43 hrs HW=8.87' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 19.37 cfs @ 6.17 fps)

Pond 6: POND A2

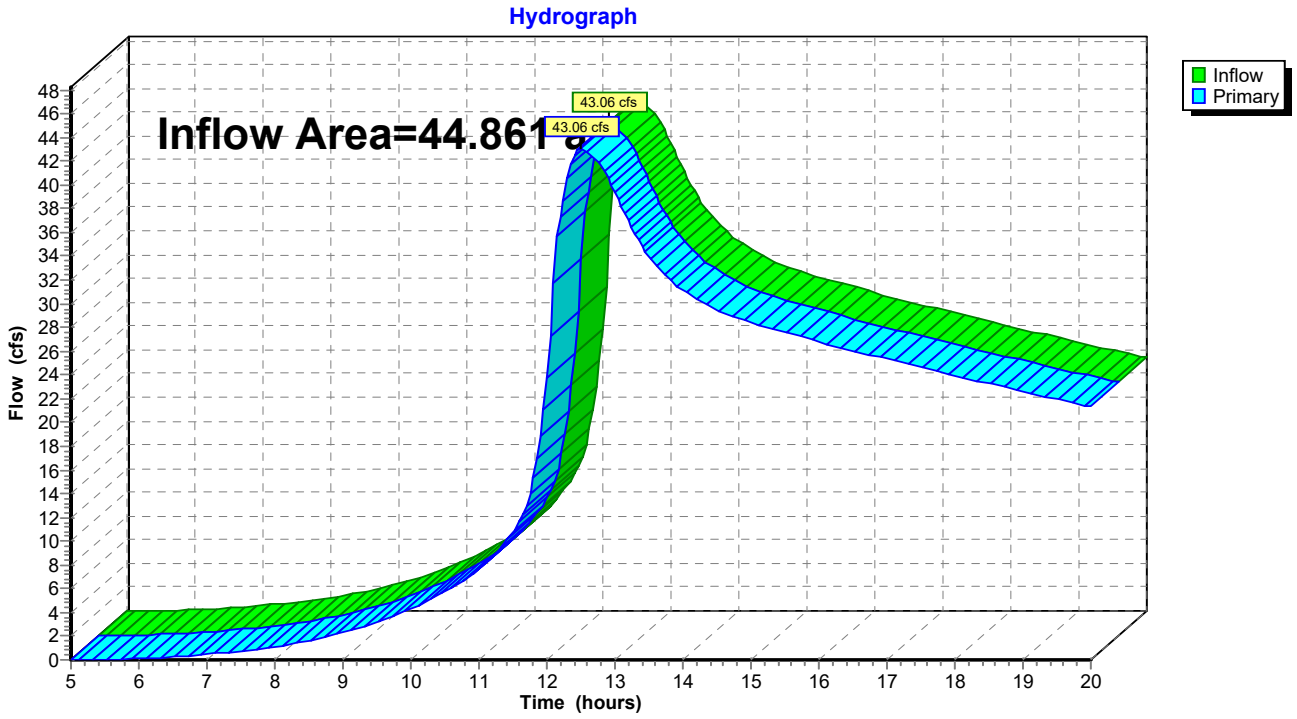


Summary for Link 7: Post - Outfall #1

Inflow Area = 44.861 ac, 72.00% Impervious, Inflow Depth > 5.56" for 100 YR event
Inflow = 43.06 cfs @ 12.51 hrs, Volume= 20.779 af
Primary = 43.06 cfs @ 12.51 hrs, Volume= 20.779 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 7: Post - Outfall #1



APPENDIX 2

USDA NRCS SOILS REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Iberville Parish, Louisiana

July 22, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:4,640 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Iberville Parish, Louisiana
Survey Area Data: Version 17, Sep 3, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 12, 2023—Mar 15, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cl	Commerce silt loam, 0 to 1 percent slopes	8.8	19.7%
Cm	Commerce silty clay loam	28.1	62.6%
Sg	Sharkey clay, 0 to 1 percent slopes, rarely flooded, deltaic plain	8.0	17.7%
Totals for Area of Interest		**44.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Iberville Parish, Louisiana

Cl—Commerce silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2rp05
Elevation: 20 to 120 feet
Mean annual precipitation: 51 to 60 inches
Mean annual air temperature: 52 to 77 degrees F
Frost-free period: 215 to 295 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Commerce and similar soils: 77 percent
Minor components: 23 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Commerce

Setting

Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
Bw - 7 to 22 inches: silty clay loam
Bg - 22 to 63 inches: silt loam
Bssg - 63 to 80 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline (0.0 to 1.2 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Very high (about 12.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F131AY405LA - Tensas Basin - Somewhat Poorly Drained Bottomland Hardwoods, F131AY503LA - Delta Plain - Somewhat Poorly Drained Bottomland Hardwoods, F131AY213AR - St. Francis - Recent Moderately Wet Natural Levee and Meander Scroll Forest

Hydric soil rating: No

Minor Components

Bruin

Percent of map unit: 10 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F131AY504LA - Delta Plain - Natural Levees and Ridge Hardwoods, F131AY406LA - Tensas Basin - Natural Levees and Ridge Hardwoods, F131AY213AR - St. Francis - Recent Moderately Wet Natural Levee and Meander Scroll Forest
Hydric soil rating: No

Sharkey

Percent of map unit: 5 percent
Landform: Backswamps
Landform position (three-dimensional): Talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F131AY201AR - St. Francis - Wet Clayey Backswamp Flat, F131AY502LA - Delta Plain - Poorly Drained Backswamp, F131AY402LA - Tensas Basin - Poorly Drained Backswamp
Hydric soil rating: Yes

Tensas

Percent of map unit: 5 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: F131AY405LA - Tensas Basin - Somewhat Poorly Drained Bottomland Hardwoods, F131AY503LA - Delta Plain - Somewhat Poorly Drained Bottomland Hardwoods, F131AY211AR - St. Francis - Old Wet Natural Levee and Meander Scroll Forest

Newellton

Percent of map unit: 3 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex, concave
Across-slope shape: Linear
Ecological site: F131AY203AR - St. Francis - Wet Transitional Backswamp Forest, F131AY405LA - Tensas Basin - Somewhat Poorly Drained Bottomland Hardwoods

Cm—Commerce silty clay loam

Map Unit Setting

National map unit symbol: 1kq8j
Elevation: 0 to 120 feet
Mean annual precipitation: 51 to 69 inches
Mean annual air temperature: 57 to 79 degrees F
Frost-free period: 259 to 317 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Commerce and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Commerce

Setting

Landform: Natural levees
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

Ap - 0 to 9 inches: silty clay loam
Bg - 9 to 28 inches: silty clay loam
Cg - 28 to 60 inches: stratified very fine sandy loam to silty clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F131AY503LA - Delta Plain - Somewhat Poorly Drained Bottomland Hardwoods
Hydric soil rating: No

Minor Components

Commerce

Percent of map unit: 6 percent
Landform: Natural levees, depressions
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F131AY405LA - Tensas Basin - Somewhat Poorly Drained Bottomland Hardwoods
Hydric soil rating: No

Tunica

Percent of map unit: 5 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F131AY402LA - Tensas Basin - Poorly Drained Backswamp
Hydric soil rating: No

Sharkey

Percent of map unit: 4 percent
Landform: Backswamps, natural levees
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F131AY402LA - Tensas Basin - Poorly Drained Backswamp
Hydric soil rating: Yes

Sg—Sharkey clay, 0 to 1 percent slopes, rarely flooded, deltaic plain

Map Unit Setting

National map unit symbol: 2zszj
Elevation: 10 to 30 feet
Mean annual precipitation: 53 to 70 inches
Mean annual air temperature: 57 to 72 degrees F
Frost-free period: 258 to 321 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sharkey and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sharkey

Setting

Landform: Meander scars on flood plains, backswamps on flood plains
Landform position (three-dimensional): Dip

Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium

Typical profile

A - 0 to 10 inches: clay
Bssg1 - 10 to 30 inches: clay
Bssg2 - 30 to 41 inches: clay
Bssg3 - 41 to 84 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F131AY502LA - Delta Plain - Poorly Drained Backswamp
Hydric soil rating: Yes

Minor Components

Commerce

Percent of map unit: 5 percent
Landform: Natural levees
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F131AY503LA - Delta Plain - Somewhat Poorly Drained Bottomland Hardwoods
Hydric soil rating: No

Tunica

Percent of map unit: 5 percent
Landform: Natural levees
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F131AY502LA - Delta Plain - Poorly Drained Backswamp
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: “National Soil Survey Handbook.”

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low: 0 to 3
Low: 3 to 6
Moderate: 6 to 9
High: 9 to 12
Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2
Low: 0.2 to 0.4
Moderately low: 0.4 to 0.75
Moderate: 0.75 to 1.25
Moderately high: 1.25 to 1.75
High: 1.75 to 2.5
Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth’s crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low: Less than 0.5 percent
Low: 0.5 to 1.0 percent
Moderately low: 1.0 to 2.0 percent
Moderate: 2.0 to 4.0 percent
High: 4.0 to 8.0 percent
Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5
Extremely acid: 3.5 to 4.4
Very strongly acid: 4.5 to 5.0
Strongly acid: 5.1 to 5.5
Moderately acid: 5.6 to 6.0
Slightly acid: 6.1 to 6.5
Neutral: 6.6 to 7.3
Slightly alkaline: 7.4 to 7.8
Moderately alkaline: 7.9 to 8.4
Strongly alkaline: 8.5 to 9.0
Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1
Moderate: 13-30:1
Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0
Coarse sand: 1.0 to 0.5
Medium sand: 0.5 to 0.25
Fine sand: 0.25 to 0.10
Very fine sand: 0.10 to 0.05
Silt: 0.05 to 0.002
Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

October 18, 2023

Programs and Project Management
Projects and Restoration

Mr. Brian Romero
Iberville Parish Government
P.O. Box 389
Plaquemine, LA 70765

RE: File # CEMVN-18238

Dear Mr. Romero:

This letter is in reference to the e-mail you sent on October 18, 2023, requesting a flood hazard determination for a site in Iberville Parish, Louisiana.

Address: Ici Road St. Gabriel, LA 70776
Section: 85 | Township: 9 South | Range: 1 East
Latitude: 30.23280278 Longitude: -91.09318333

Enclosed is a portion of the Digital Flood Insurance Rate Map (DFIRM) identifying the location of the site. Information from this map and preliminary hydraulic investigations indicate that the site is located in Zone A with an associated base flood elevation of +17' North American Vertical Datum - (NAVD).

The U.S. Army Corps of Engineers (USACE) provides engineering advice to local interests for their use in planning to reduce the risk of flooding through the Floodplain Management program. This service is provided to state, parish, and local governments at no charge. Using available data, USACE provides this service in the form of Base Flood Elevation (BFE) assessments, which is the computed elevation to which floodwater is anticipated to rise during the base flood. The base flood elevations provided should be used for planning purposes only and should not be used to support letters of map change.

Although USACE provides base flood elevation assessments for the 100-year flood event, this does not guarantee that the location of interest will not experience flooding. Furthermore, even though USACE assigns base flood elevations for specific locations within the corresponding floodplain, the assessment is a conservative recommendation which should be used for planning purposes and may be beneficial when used in conjunction with determinations made by FEMA, qualified Surveyors, or Parish/City floodplain administrators to determine final design elevations.

The official base flood elevation provided to property owners is determined by the local governing entity that holds jurisdiction over the location of the property since the local floodplain administrator may have a greater extensive knowledge and understanding of the floodplains, floodways, and flood hazards within their city or parish.

We encourage you to contact the FEMA Mapping Center with any questions about the flood maps, the data used to produce the flood maps, or product availability. For more information about the FEMA mapping center, please visit their website at www.msc.fema.gov/ or contact a representative directly using the contact number (877) 336-2627.

If you require any additional information concerning the above, feel free to call Luis J Flores at 504-862-2150.

Enclosure(s)


33
76
67
34
77
Zone X
98
ST GABRIEL
22005C0100E
18238 (+17')
T9S R1E
22047C0355D
Iberville
PARISH
99
85
Zone A
84

JEFF LANDRY
GOVERNOR

COURTNEY J. BURDETTE
SECRETARY

STATE OF LOUISIANA

DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL SERVICES

DEC 0 9 2025

Elliott Boudreaux
CSRS, LLC
8555 United Plaza Boulevard
Baton Rouge, Louisiana 70809

AI No.: 14535
Activity No.: CER20250001

RE: Mexichem Fluor Inc. – St. Gabriel LiPF6 Plant
Water Quality Certification WQC 250926-01
Corps of Engineers Permit MVN-2022-00332-CR
Iberville Parish

Dear Mr. Boudreaux:

The Louisiana Department of Environmental Quality, Water Permits Division (LDEQ), has reviewed the application requesting authorization to clear, grade, excavate, and place fill to expand Mexichem Fluor Inc.'s existing industrial operations off Ici Road in St. Gabriel, Iberville Parish. The proposed work includes the construction of a lithium hexafluorophosphate manufacturing facility and associated infrastructure adjacent to the existing Mexichem fluoroproducts plant.

The application and the additional information received November 18 and December 2, 2025, have been reviewed to assess compliance with State Water Quality Standards, the approved Water Quality Management Plan and applicable state water laws, rules and regulations. LDEQ has complied with its public notice procedures established pursuant to Clean Water Act Section 401(a)(1). LDEQ determined that the requirements for a Water Quality Certification have been met. LDEQ concludes that the discharge of fill will not violate water quality standards as provided for in LAC 33:IX.Chapter 11. Therefore, LDEQ hereby issues Mexichem Fluor Inc. – St. Gabriel LiPF6 Plant Water Quality Certification, WQC 250926-01.

Should you have any questions concerning any part of this certification, please contact Jace Hood at (225) 219-2743 or by email at jace.hood@la.gov. Please reference Agency Interest (AI) number 14535 and Water Quality Certification 250926-01 on all future correspondence to this Department to ensure all correspondence regarding this project is properly filed into the Department's Electronic Document Management System.

Sincerely,

Amanda Vincent, PhD, PMP
Assistant Secretary

c: IO-W

ec: jeremy.d.rodriguez@usace.army.mil

elliott.boudreaux@csrsinc.com

November 10, 2025

Ms. Jennifer Sheppard, Administrator
Louisiana Department of Environmental Quality
Water Permits Division
P.O. Box 4313
Baton Rouge, LA 70821-4313
Attn: Water Quality Certifications

RE: **Mexichem Fluor Inc. – St. Gabriel LiPF6 Plant**
LDEQ AI # 14535
Water Quality Certification WQC 250926-01
Corps of Engineers Permit MVN-2022-00332-CR
Iberville Parish, LA
CSRS Project # 222146

Dear Ms. Sheppard,

CSRS, LLC (CSRS) on behalf of Mexichem Fluor Inc. provides the following responses to LDEQ's request for additional information letter dated on October 10, 2025. This Water Quality Certification is being requested pursuant to an application for a U.S. Army Corps of Engineers Section 404 permit to clear, grade, excavate, and place fill to construct The Mexichem LiPF6 Facility in St. Gabriel, Iberville Parish, LA.

LDEQ Comment #1: A proof of publication of the Public Notice in THE ADVOCATE of Baton Rouge per LAC 33: IX.1507.D

CSRS Response #1: Proof of publication of the Public Notice in THE ADVOCATE of Baton Rouge is provided in Attachment 1.

LDEQ Comment #2: A commercial processing fee of $385.00 per LAC 33: IX.1507.A.2.a.

CSRS Response #2: Enclosed, please find a check for $385.00 in Attachment 2 (CSRS Check #1258) to cover the above-mentioned processing fee.

LDEQ Comment #3: The proposed project is located in Subsegment 040201: Bayou Manchac-From headwaters to Amite River. The existing Mexichem facility discharges process wastewater to the Mississippi River, specifically Subsegment 070301: Mississippi River-From Monte Sano Bayou to Head of Passes, while non-process area stormwater and other de minimus wastewaters are discharged to Subsegment 040201. According to the 2024 Louisiana Water Quality Inventory: Integrated Report, Subsegment 040201 is currently not supporting its designated use of fish and wildlife propagation. The causes of this impairment are chloride, dissolved oxygen, sulfate, and total dissolved solids. The sources of these impairments are on-site treatment system systems (septic systems and similar decentralized systems) and natural sources. Subsegment 070301 is currently supporting its designated uses.

According to the Louisiana Water Quality Management Plan, a Total Maximum Daily Load (TMDL) regarding oxygen-demanding substances has been approved by the EPA for Subsegment 040201. The TMDL requires a reduction in oxygen-demanding loading. To ensure the proposed project does not further cause or contribute to any water quality impairment and to maintain the designated uses of the receiving watershed, additional information regarding the proposed project is requested.

A. If Proposing New or Increased Discharges to Subsegment 040201:

i. New discharges of oxygen-demanding loads:

a. In general, LDEQ does not intend to permit additional discharges of oxygen demanding loads. However, in the event that one of the following requirements can be attained, LDEQ may permit the new discharge. The typical permit limits will be 5 mg/L BODs / 2 mg/L NHJ / 5 mg/L DO. Such new facilities may be required to submit an environmental impact assessment to LDEQ's permitting staff, which will conduct a thorough evaluation of the proposed facility based on environmental impacts, economic benefits, an analysis of alternatives, and other pertinent factors.

1. The facility demonstrates that it will provide a significant load reduction of man made oxygen-demanding constituents to the impaired watershed(s) serviced by the facility. The facility must also contribute to a reduction in the number of facilities discharging to the watershed(s). Facilities that may be considered for permits under this provision include, but are not limited to:
   i. A facility that will provide improved sewage treatment to multiple subdivisions previously serviced by wastewater treatment plants that are incapable of treating to tertiary limits.
   ii. A facility that will provide sewage collection and treatment to previously unsewered areas in which many of the sanitary discharges from permitted facilities and individual home treatment units were entering an impaired watershed. As a result, the facility would be expected to provide more efficient treatment of the wastewater and reduce the net loading of oxygen-demanding substances in the watershed.
2. The facility demonstrates that its wastewater will not leave the facility or its property. Significant stormwater events do not apply to this provision. For the purpose of this provision, a significant stormwater event is defined as the 25 year, 24 hour rainfall event or its numerical equivalent, as defined by the Southern Regional Climate Center.

   a. Facilities that may be considered under this provision include, but are not limited to:
      i. Effluent reduction systems that have been approved by the Louisiana Department of Health and Hospitals.
      ii. Wastewater treatment plants equipped with overland flow systems in which the effluent will not leave the facility.
      iii. Wastewater treatment plants equipped with holding ponds that will retain the effluent such that the effluent will not leave the facility.

   b. LDEQ recognizes that some local governments are in the process of building or expanding regional sewage collection and treatment systems. In such areas, LDEQ may, on a limited basis, grant permits of limited durations to facilities that agree to tie into a regional collection and treatment system when it becomes available. LDEQ must have absolute assurance that the regional collection system will be available to the facility and the facility will connect to the regional collection system on or before the expiration date of the permit. Such assurance may include a formal agreement between the facility, the owner and operator of the regional wastewater treatment system, and **LDEQ.** The regional system must have the capacity to treat the additional wastewater. Such a permit may have a duration of less than five years or it may have a five year duration with interim permit limits. The permit will be written based on projected completion dates for the construction of the collection and treatment system. The facility will be required to cease all wastewater discharges to the Bayou Manchac watershed and transfer the discharge to the regional collection system once the permit or interim limits

expire or the collection system is available to the facility, whichever comes first. If the permit or interim limits expire, but, due to unforeseen circumstances, the availability of the collection system has been temporarily delayed, the duration of the permit or interim limits may be extended. If the availability of the collection system has been indefinitely delayed, the facility may be required to cease all discharges to the Bayou Manchac watershed. Such facilities may resort to options covered in item I.b.i. above.

3. LDEQ reassesses Subsegment 040201 (Bayou Manchac). LDEQ determines that Subsegment 040201 is meeting the appropriate DO criteria and designated uses.

ii. Existing discharges of oxygen demanding loads:

A. Below are the reductions for existing dischargers in the Bayou Manchac TMDL. Existing facilities discovered to be discharging oxygen-demanding loads without LPDES permits as of the TMDL approval date are to be permitted in accordance with the limits established for existing facilities with permits. Unpermitted facilities that are newly activated or reactivated and discharging after the TMDL approval date may be subjected to enforcement actions and will be required to tie into regional collection and treatment systems, once those systems are available.

1. Facilities (with effluent flow less than or equal to 25,000 gpd) with monthly average limitations of 30 mg/L BODS or weekly average limitations of 45 mg/L BODS will receive a compliance schedule of up to 3 years with final limitations of 10 mg/L BODS / 2 mg/L NH3 / 5 mg/L DO (with post aeration);
2. Facilities (with effluent flow greater than 25,000 gpd) with limitations of 10 mg/L BODS will receive a compliance schedule of up to 3 years with final limitations of 5 mg/L BODS/ 2 mg/L NH3 / 5 mg/L DO (with post aeration);
3. The Landing at Mallard Lakes (AI# 154124) will have permits of 10 mg/L BODs/ 2 mg/L NH3/ 5 mg/L DO.

B. Provide assurance LPDES Permit No. LA0062090 will be modified to include any new or modified discharges from the facility.

C. Assurance that all required discharge permits, *(e.g.,* construction stormwater), will be obtained from LDEQ for any other discharges that will be generated from the site. LAC 33:IX.1507.A.5

*NOTE THE ISSUANCE OF A WATER QUALITY CERTIFICATION DOES NOT GUARANTEE ISSUANCE OF AN LPDES PERMIT. In accordance with LAC 33:IX.2317.A.9, LPDES permits may not be issued to a new source or new discharger in a subsegment which does not meet applicable water quality standards if the discharge has the reasonable potential to cause or contribute to the violation of water quality standards. **THE APPLICANT SHOULD PROCEED WITH CAUTION UNTIL RECEIPT OF A FINAL LPDES PERMIT**.

CSRS Response #3: The non-process area storm water and other de minimis wastewaters from the proposed project will be discharged to Subsegment 040201 similar to the discharges from the existing facility. The existing non-process area storm water and other de minimis wastewaters discharged to Subsegment 040201 have very low oxygen demanding characteristics as demonstrated with the 2024 renewal application (EDMS Doc. ID 14344763). The characteristics of the non-process area storm water and other de minimis wastewaters from the proposed project are expected to be similar to the existing discharges to Subsegment 040201. The proposed detention ponds are utilized to limit the post-developed runoff rate (based on the 100-year storm event) to the pre-developed runoff rate (based on the 10-year storm event). The proposed ponds will also contain the 100-year storm event volume from each drainage area, without any outflow from the ponds. While the volume of storm water may increase slightly, storm water discharges do not occur during critical times. The TMDL was drafted for critical low flow within Bayou Manchac and the non-process area storm water and other de minimis wastewaters from the proposed project are not expected to

discharge during critical low flow periods. Furthermore, while the Bayou Manchac Watershed TMDL for Biochemical Oxygen Demanding Substances assigned wasteload allocations to nonpoint sources such as municipal separate storm sewer systems, wasteload allocations were not assigned to storm water discharges from industrial facilities. Therefore, the proposed project is not expected to cause or contribute to further impairment within Subsegment 040201, nor are the discharges expected to increase the oxygen demanding load within the subsegment.

The chloride, sulfate, and total dissolved oxygen impairments in Subsegment 040201 are attributed to natural sources. The non-process area storm water and other de minimis wastewaters from the proposed project are not expected to further contribute to the chloride, sulfate, and total dissolved oxygen impairments in Subsegment 040201.

LDEQ Comment #4: Assurance to the best of your knowledge any excavated, and fill material does not contain unsuitable material (e.g., trash, debris, asphalt, etc.) and toxic pollutants in toxic amounts or it will be disposed of in an approved landfill as necessary. LAC 33IX.1507. A.5

CSRS Response #4: Excavated fill material will be free of contaminants or will be disposed of in an approved landfill as necessary. Any offsite fill material that will be brought in will be from an acceptable source location and certified clean. LAC 33IX.1507. A.5

LDEQ Comment #5: Maps, drawings or plats indicating the type, diameter or cross-section and length of any conduit conveying a discharge. LAC 33: IX. 507.A. l.l

CSRS Response #5: Attachment 3, Attachment 4, and Attachment 5, have been provided to outlines the type, diameter and cross section of all conduits conveying a discharge for the project. LAC 33: IX. 507.A. l.l

LDEQ Comment #6: Maps, drawings or plats at an appropriate scale and referenced to a commonly used set of geographic coordinates (latitude/longitude) that provide sufficient detail to accurately delineate the boundaries of the proposed project. LDEQ is unable to use Surveyor's bearings for our purposes. Please reference the corners of the property to geographic coordinates in decimal degrees or degrees-minutes-seconds. LAC 33: IX.1507.A.l.n.i

CSRS Response #6: An updated exhibit showing the boundaries of lands to be used for the development is provided in Attachment 6. All coordinates shown are Louisiana South – State Plane Coordinates. LAC 33: IX.1507.A.l.n.i

LDEQ Comment #7: Maps, drawings, or plats that provide sufficient detail to accurately delineate the location, nature and direction of flow of the first named receiving waterbody of the proposed project. LAC 33: IX.1507.A.1.n.ii

CSRS Response #7: An exhibit is provided as Attachment 7 to show the location, nature and direction of flow to the first named receiving waterbody, Bayou Braud. LAC 33: IX.1507.A.1.n.ii

LDEQ Comment #8: Maps, drawings, or plats that provide sufficient detail to accurately delineate the location, dimensions, and type of any temporary structures (fences) erected or to be erected during the construction of the proposed project. LAC 33: IX.I 507. A. l.n.iii

CSRS Response #8: An exhibit is provided as Attachment 8 and Attachment 9 to show the locations, dimensions and type of temporary structures required during construction. LAC 33: IX.I 507. A. l.n.iii

LDEQ Comment #9: A signed, legible copy of the ENG Form 4345, signed by the applicant, authorizing the agent to act on their behalf in the processing of the application and to furnish, upon request, supplemental information in support of the permit application. LAC 33:IX.1507.A.8

CSRS Response #9: A signed legible copy of the ENG Form 4345 (MVN-2022-00332) is provided as Attachment 10.

If you have any questions or additional concerns, please contact me at Elliott.Boudreaux@westwoodps.com or (225) 335-1716. Your time and efforts are sincerely appreciated.

Respectfully,

Elliott Boudreaux
CSRS, Permit Agent on behalf of Mexichem Fluor Inc.

LDEQ Responses: Attachments 1-10

CC: Mr. Jeremy Rodriguez, USACE

Attachments:

1-10

THE ADVOCATE
The Times-Picayune | nola.com
THE ACADIANA ADVOCATE
gambit

Campaign No.	164413
Today's Date	24 Oct 2025
P.O. Number	Elliott Boudreaux WQC Mexichem Fluor Inc.
Sales Rep	Mattinisha Singleton

Attachment #1

bill-to

CSRS
8555 UNITED PLAZA BLVD
BLDG 4
Baton Rouge, LA 70809-
Tel: 225 769-0546
Account No: 100179

advertiser

CSRS
8555 UNITED PLAZA BLVD
BLDG 4
Baton Rouge, LA 70809-
Tel: 225 769-0546
Account No: 100179

campaign summary

Description	
Start Date	10/28/2025
End Date	10/28/2025

cost summary

Campaign Amount	$186.71
Estimated Tax	$0.00
Pre-payment Amount	$#PREPAY_AMOUNT#
Total	**$186.71**

Pre-Payment Details

Pre-Payment Amount	Pre-Payment Date	Pre-Payment Card No.

No Pre-Payments on this order

advertisement

Line No.	Product	Description	Issue / Run Date	Size			Amount
542005	Baton Rouge Advocate Online	Legal Online Zero	10/28/2025	1			0.00

PUBLIC NOTICE
- - -

Notice is hereby given that Mexichem Fluor Inc. has applied for a 401 Water Quality Certification to clear, grade, excavate, and place fill to expand Mexichem Fluor Inc.'s existing industrial operations off Ici Road in St. Gabriel, Iberville

Line No.	Product	Description	Issue / Run Date	Size			Amount

St. Gabriel, Iberville Parish. The proposed work includes the construction of a lithium hexafluorophosphate manufacturing facility and associated infrastructure adjacent to the existing Mexichem fluoroproducts plant. Mexichem Fluor Inc. is applying to the Louisiana Department of Environmental Quality, Office of Environmental Services for a Water Quality Certification in accordance with statutory authority contained in the LAC 33: IX.1507.A-E and provisions of Section 401 of the Clean Water Act.

Comments concerning this application can be filed with the Water Permits Division within ten days of this notice by referencing WQC 250926-01, AI 14535 to the following address:

Louisiana Department of Environmental Quality
Water Permits Division
P.O. Box 4313
Baton Rouge, LA
70821-4313 Attn: Water Quality Certifications

Comments may be submitted by email to **DEQ-WaterQualityCertiftcations@la.gov.**

A copy of the application is available for inspection and review at the

Line No.	Product	Description	Issue / Run Date	Size			Amount

tion and review at the LDEQ Public Records Center at 602 North Fifth Street, Baton Rouge, LA 70802, from 8:00 a.m. to 4:30 p.m. The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the LDEQ public website at **www.deq.louisiana.gov.**

164413 Oct. 28, 1t
$186.71

542006	The Advocate Baton Rouge	Legal Open Rate	10/28/2025	1			186.71

PUBLIC NOTICE
- - -

Notice is hereby given that Mexichem Fluor Inc. has applied for a 401 Water Quality Certification to clear, grade, excavate, and place fill to expand Mexichem Fluor Inc.'s existing industrial operations off Ici Road in St. Gabriel, Iberville Parish. The proposed work includes the construction of a lithium hexafluorophosphate manufacturing facility and associated infrastructure adjacent to the existing Mexichem fluoroproducts plant. Mexichem Fluor Inc. is applying to the Louisiana Department of Environmental Quality, Office of Environmental Services for a Water Quality Certifica-

Line No.	Product	Description	Issue / Run Date	Size			Amount

tion in accordance with statutory authority contained in the LAC 33: IX.1507.A-E and provisions of Section 401 of the Clean Water Act.

Comments concerning this application can be filed with the Water Permits Division within ten days of this notice by referencing WQC 250926-01, AI 14535 to the following address:

Louisiana Department of Environmental Quality
Water Permits Division
P.O. Box 4313
Baton Rouge, LA
70821-4313 Attn: Water Quality Certifications

Comments may be submitted by email to **DEQ-WaterOualityCertiftcations@la.gov.**

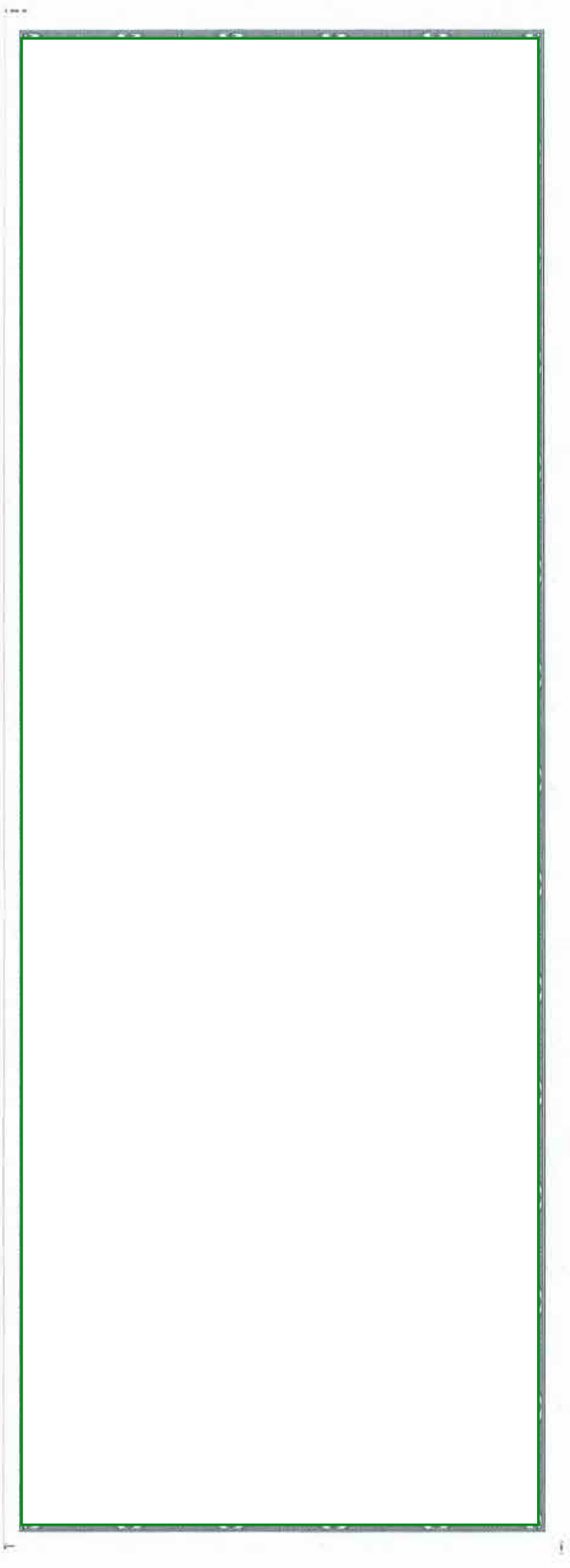
A copy of the application is available for inspection and review at the LDEQ Public Records Center at 602 North Fifth Street, Baton Rouge, LA 70802, from 8:00 a.m. to 4:30 p.m. The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the LDEQ public website at **www.deq.louisiana.gov.**

164413 Oct. 28, 1t
$186.71

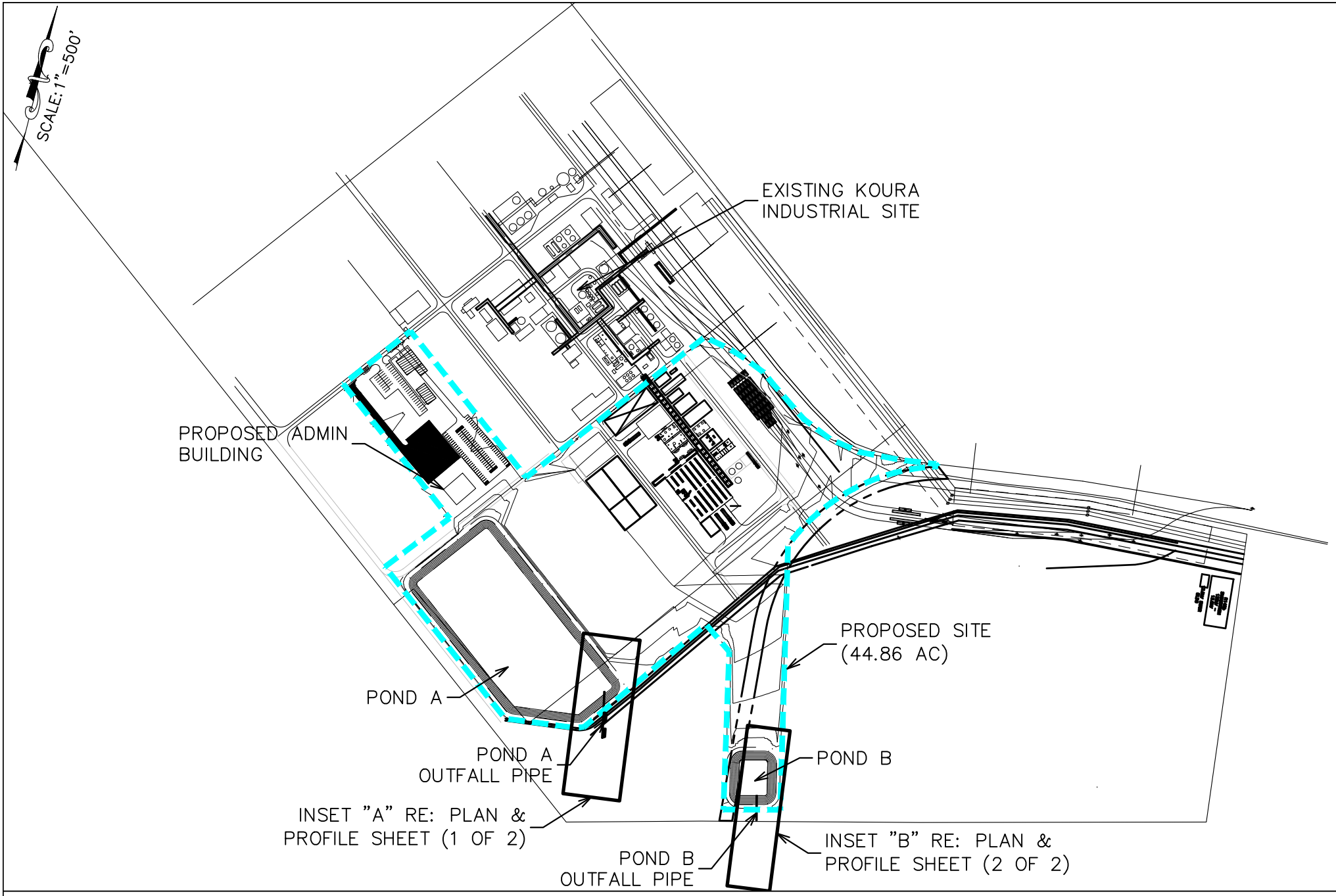
Line No.	Product	Description	Issue / Run Date	Size			Amount
							$180.71

COPY OF ADVERTISEMENT

Attachment #2



CSRS Check



CSRS
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

SITE LAYOUT

Date: OCTOBER 2025

Project Number: 222146

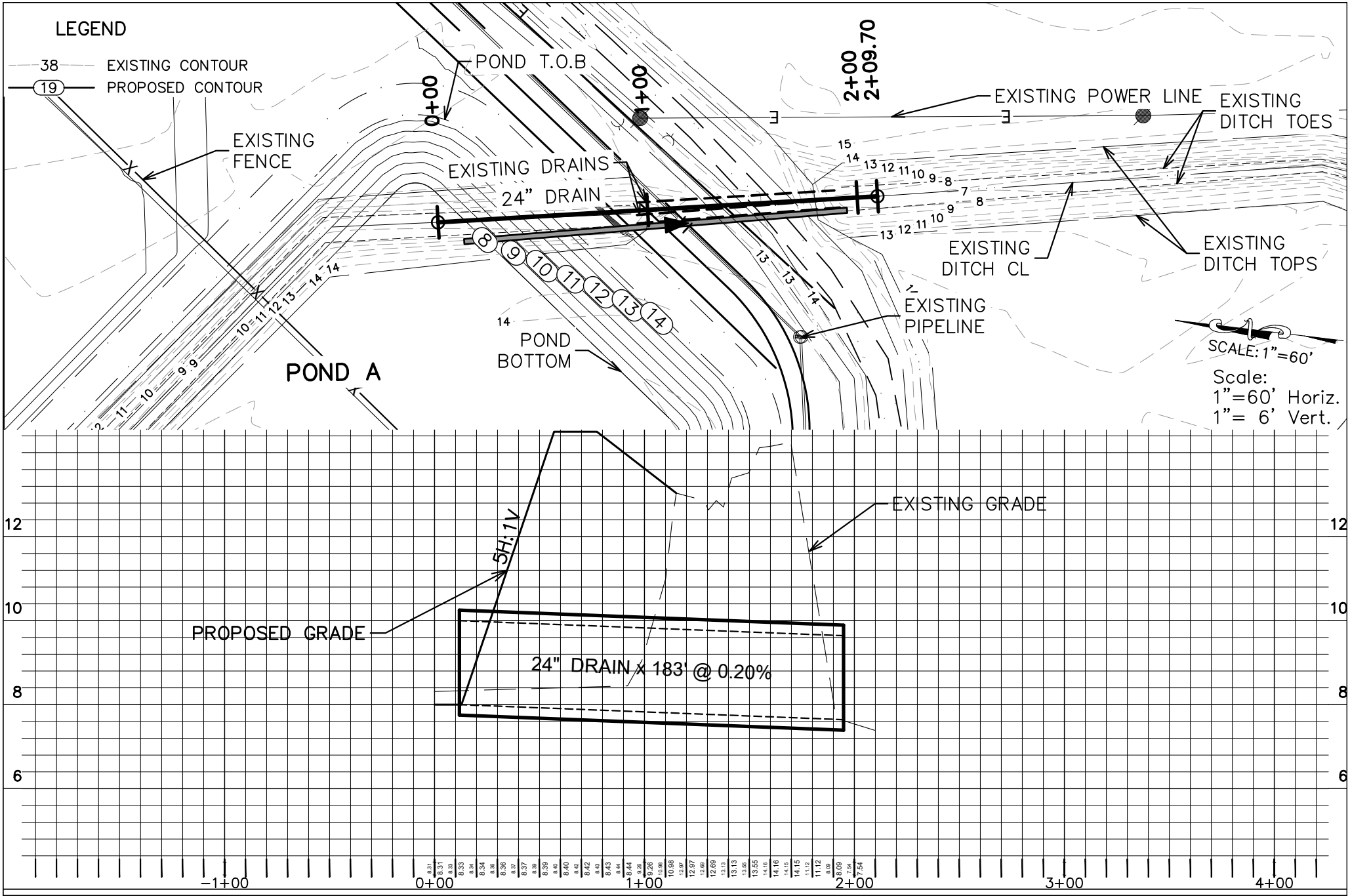
Attachment #3

MEXICHEM FLUOR INC.
IBERVILLE PARISH, LA

PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

CSRS a Westwood company



CSRS
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

PLAN & PROFILE (SHEET 1 OF 2)

Date: OCTOBER 2025

Project Number: 222146

Attachment #4

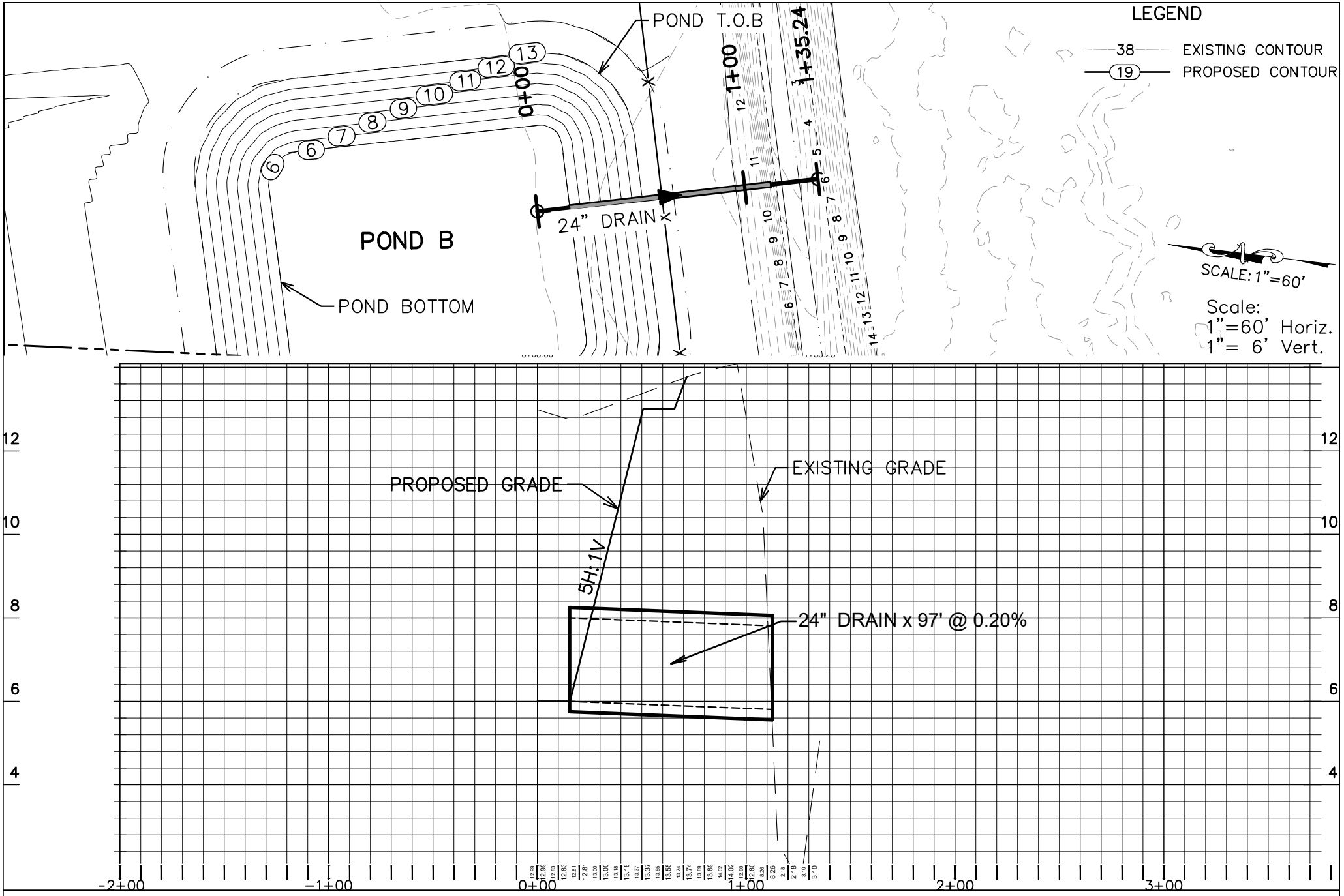
MEXICHEM FLUOR INC.

IBERVILLE PARISH, LA

PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

CSRS a Westwood company



CSRS
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

PLAN & PROFILE (SHEET 2 OF 2)

Date: OCTOBER 2025

Project Number: 222146

Attachment #5

MEXICHEM FLUOR INC.

IBERVILLE PARISH, LA

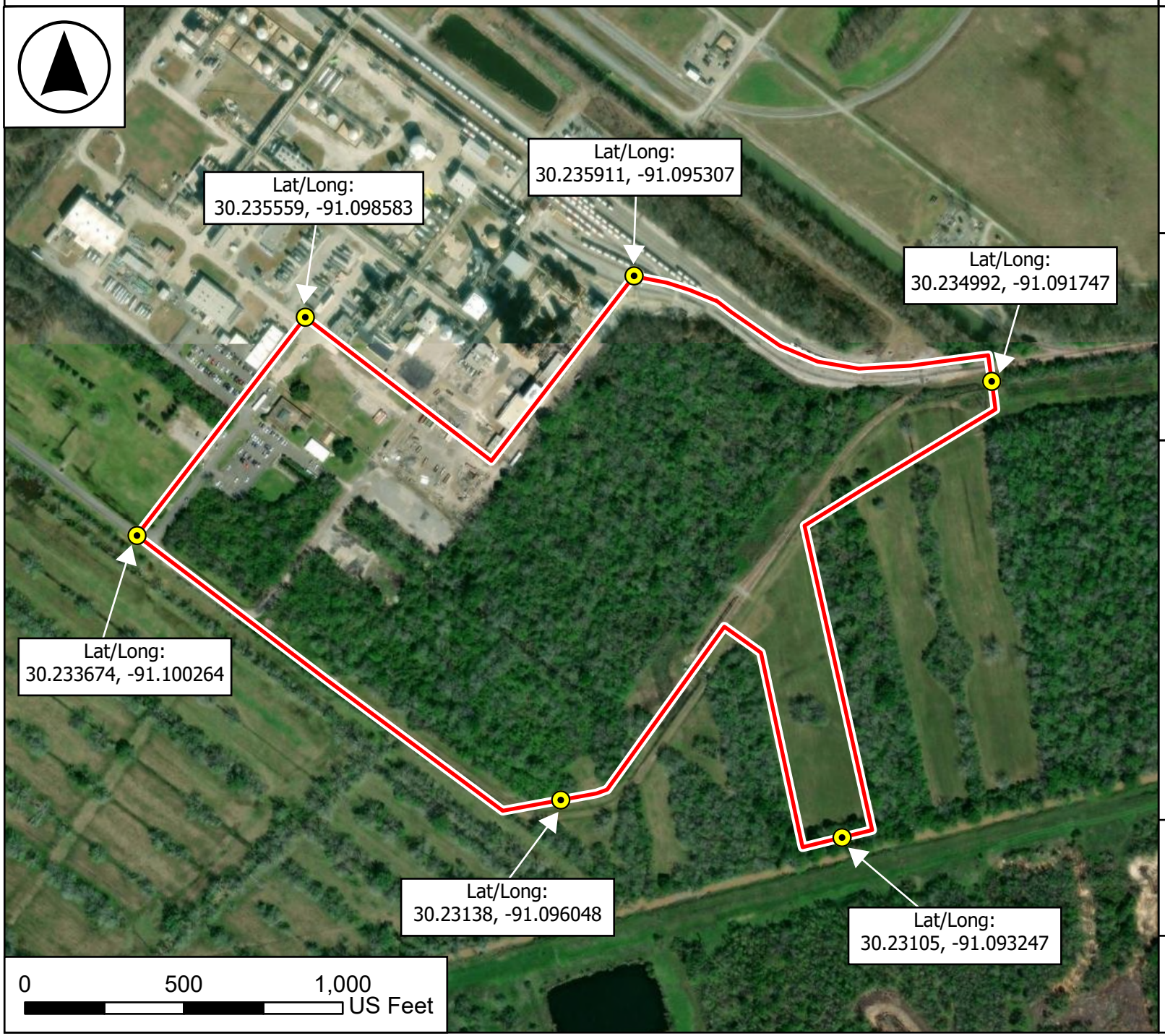
PRELIMINARY WORK

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

CSRS a Westwood company

Attachment #6 - General Overview Map

Site Exhibit
Koura LiPF6 Facility
Iberville Parish, LA



Louisiana

Iberville Parish

Legend

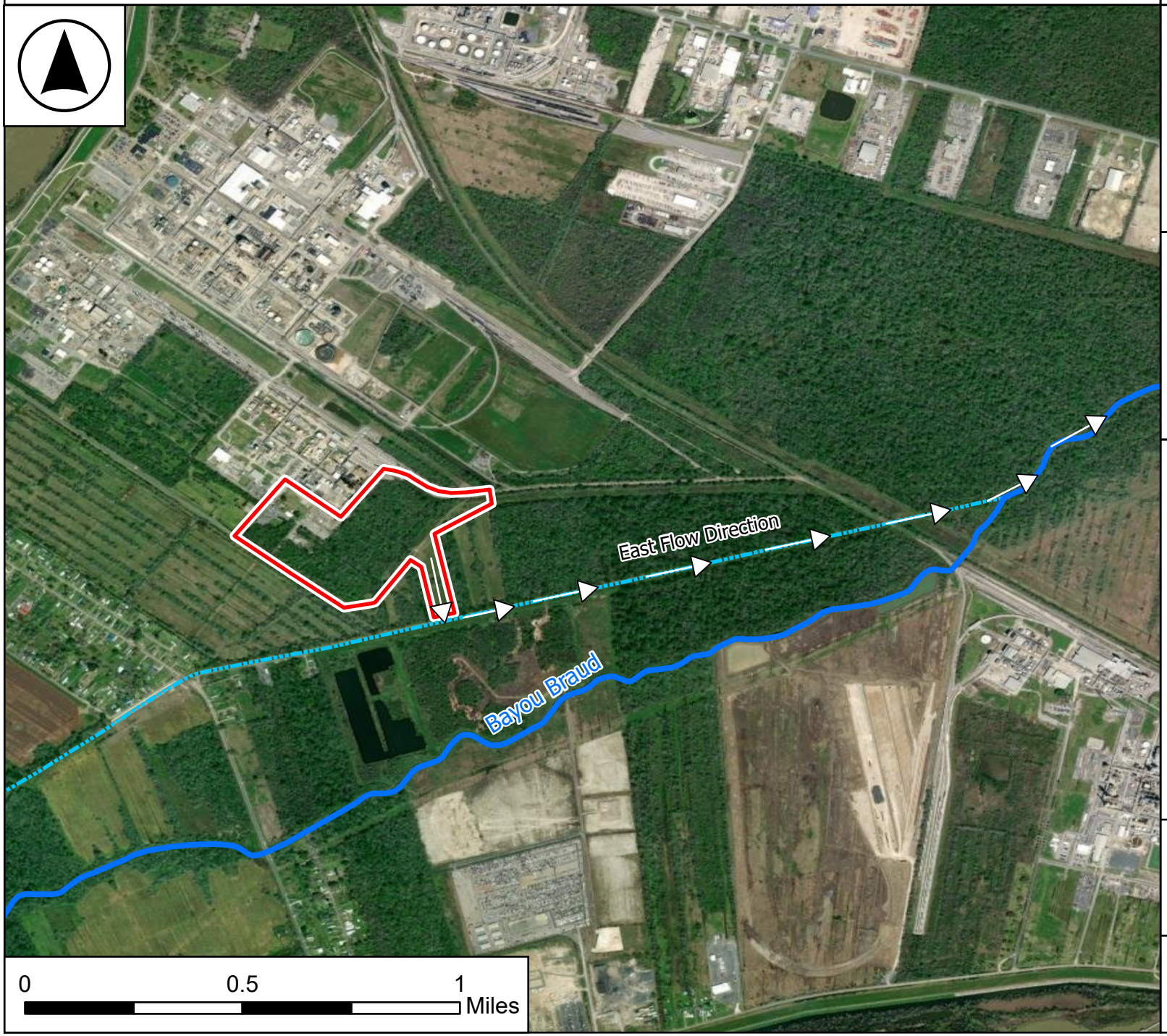
- **Koura LiPF6 Site (55.71 Ac.)**
- **Project Boundaries**

CSRS
a Westwood company

Project Name:	Koura LiPF6
Project Number:	222146
Date:	10/20/2025
Drawn by:	EDT
Checked by:	EEB

Attachment #7 - Watershed Map

Site Exhibit
Koura LiPF6 Facility
Iberville Parish, LA



Louisiana

Iberville Parish

Legend

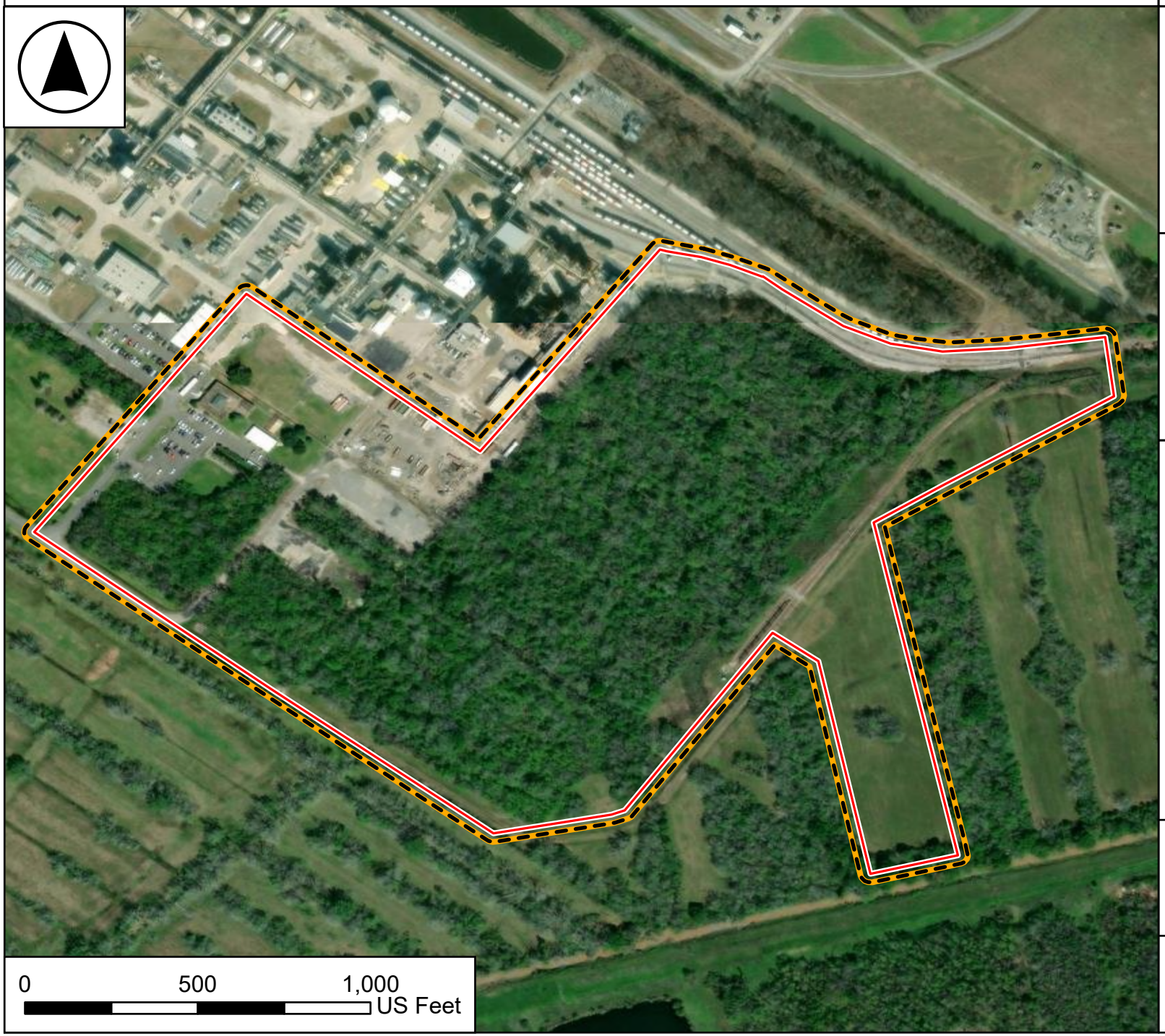
- Koura LiPF6 Site (55.71 Ac.)
- Major Recieving Waterbody
- Minor Water Feature

CSRS
a Westwood company

Project Name:	Koura LiPF6
Project Number:	222146
Date:	10/20/2025
Drawn by:	EDT
Checked by:	EEB

Attachment #8 - Temporary Structures Map

Site Exhibit
Koura LiPF6 Facility
Iberville Parish, LA



Louisiana

Iberville Parish

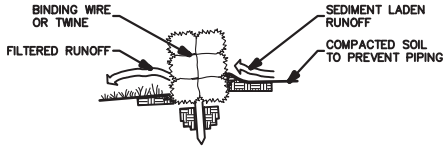
Legend

- Koura LiPF6 Site (55.71 Ac.)
- Silt Fencing

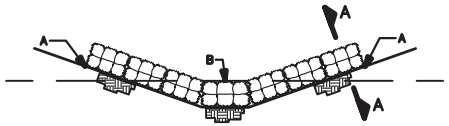
Silt fencing will be installed around the entire limits of construction. Installation details and dimensions are provided as Attachment #9*

CSRS
a Westwood company

Project Name:	Koura LiPF6
Project Number:	222146
Date:	10/22/2025
Drawn by:	EDT
Checked by:	EEB



SECTION A–A



POINTS A SHOULD BE HIGHER THAN POINT B.

ELEVATION

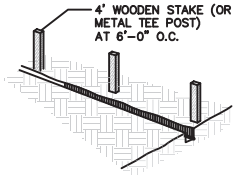
NOTE:
THE HAY BALES SHALL BE IN ACCORDANCE WITH LA DOTD STANDARD SPECIFICATIONS, SECTION 204.

A HAY BALES
SCALE: N.T.S.

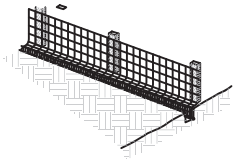
NOTES:
1. USE IN DITCHES OR SWALES WHICH NEED PROTECTION DURING THE ESTABLISHMENT OF GRASS LININGS.
2. FOR STONE SPECIFICATIONS, SEE SUBSECTION 711.02(a)(CLASS 2LB.) OF THE LA DOTD STANDARD SPECIFICATIONS

B STONE
SCALE: N.T.S.

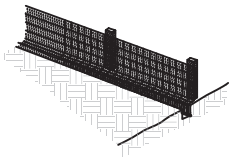
1 TEMPORARY SEDIMENT CHECK DAM
SCALE: N.T.S.



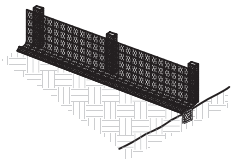
1. SET POSTS AND EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE



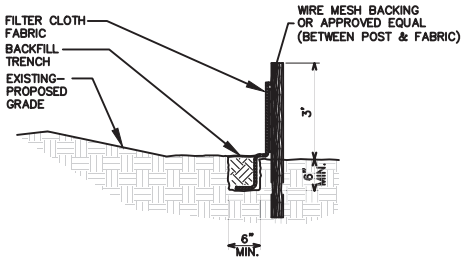
2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH.
CONSTRUCTION OF A SILT FENCE

2 SILT FENCE
SCALE: N.T.S.

CSRS
a Westwood company
8555 United Plaza Blvd., Baton Rouge, LA 70809
Telephone: 225 769-0546 Fax: 225 767-0060
www.csrsinc.com

EROSION CONTROL DETAILS

Date: OCTOBER 2025

Project Number: 222146

Attachment #9

MEXICHEM FLUOR INC.
IBERVILLE PARISH, LA

PRELIMINARY WORK
THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR BASIS FOR THE ISSUANCE OF A PERMIT.

CSRS
a Westwood company

Appendix D - Conformity Analysis

Activity * EF = Emission Rate

Tier 4 Exhaust Emission Factor[1]		lb/hp-hr	lb/kw-hr
56<kW<560	Nox	0.000656216	0.00088
	VOC	0.000312352	0.00041887
kW<56	Nox	0.006134927	0.00822707
	VOC	0.001591681	0.00213448

*Tier 3 Exhaust Emission Factor[2]	g/mile	lb/mile
Nox	0.0397	8.7522E-05
VOC	0.0103	2.27072E-05

Conversion				
1	lb/yr	=	0.0005	ton/yr
1	kw	=	1.34102209	hp

Equipment	HorsePower (HP)	Run Time (Hr/Wk)	Wk/ Year	Number of Engines	Nox (lb/yr)	VOC (lb/yr)
Bull Dozer	165	20	24	2	103.945	49.477
Excavators	200	20	24	3	188.990	89.957
Tree Cutters	200	20	12	2	62.997	29.986
Tree Chipper	350	20	12	1	55.122	26.238
Dump Trucks	500	20	24	15	2362.377	1124.468
Skid Steers	100	16.7	52	4	227.943	108.499
Pile drivers (Crane)	200	20	16	2	83.996	39.981
Concrete Trucks	480	5.6	24	10	423.338	201.505
Forklift	200	20	52	4	545.972	259.877
Crawler Cranes	200	22.5	48	5	708.713	337.340
Cherry Picker	200	20	52	4	545.972	259.877
SPMT	300	20	24	8	755.961	359.830
Manlifts	70	22.5	52	6	322.464	153.490
Disel Hammer	50	20	16	2	196.318	50.934
Disel Welder	40	20	52	6	1531.278	397.284
Light Plants	25	20	52	12	1914.097	496.605
Generators	25	20	52	4	638.032	165.535
UTVs	25	20	52	12	1914.097	496.605
Pickup Trucks*	400	20	52	6	13.653	3.542
				lbs/year	**12,595.26**	**4,651.03**
				tons/year	**6.30**	**2.33**
				total (tons/ yea	**8.62**	

Data Source

(1) Emission Factor is based on the alternate NOx and VOC emission standards allowed as specified in 40 CFR 1039.102(e), which were used for the certified engine family to which this engine belongs.

(2) Emission Factor is based on the Nox exhaust emission standard as specified in 40 CFR 86.1811-17

Assumptions

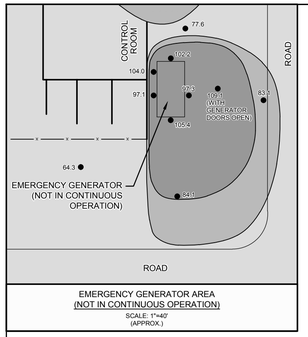
Pickuptrucks are operating at an average speed of 25 miles per hour for 33.3 hours per week

Pickup trucks are classified as light duty trucks and are model year 2025 or newer

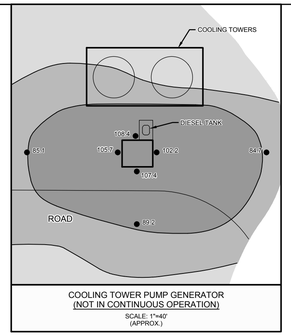
All other construction equipment is model year 2014 or newer

Appendix E -Noise Contour Map

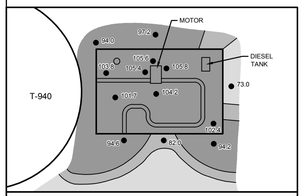
NOISE CONTOUR MAPS - PROCESS TOWER



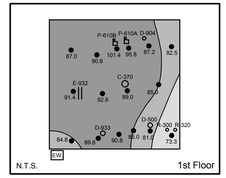
EMERGENCY GENERATOR AREA
(NOT IN CONTINUOUS OPERATION)
SCALE: 1"=40'
(APPROX.)

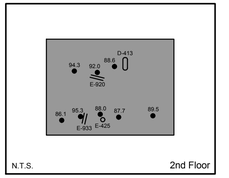


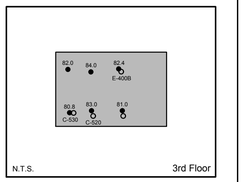
COOLING TOWER PUMP GENERATOR
(NOT IN CONTINUOUS OPERATION)
SCALE: 1"=40'
(APPROX.)

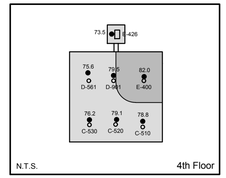


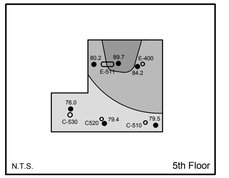
FIRE WATER PUMP
(NOT IN CONTINUOUS OPERATION)
SCALE: 1"=20'
(APPROX.)

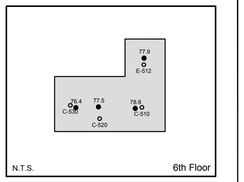


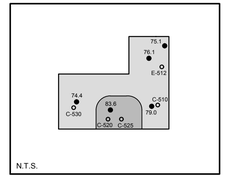


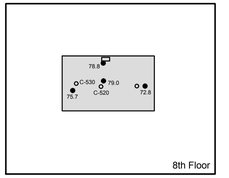


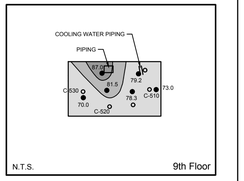


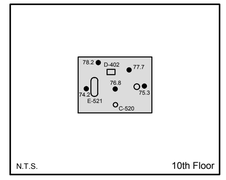


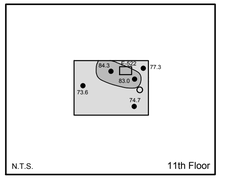


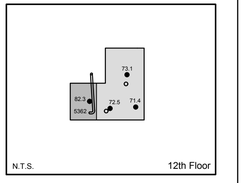


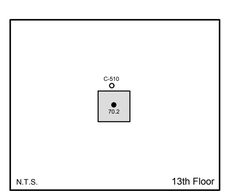


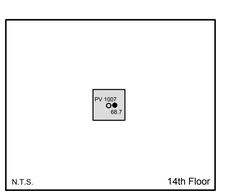












Notes:
1. Values are measured in decibels (dB).
2. Noise survey conducted on March 21, 2018 by Clay Clark, CIH (GHD) during Normal Facility Operations.
3. Equipment used to conduct the noise survey consisted of a 3M Sound Pro SPDL-1-1/3 sound level meter (SN-BLM010004), calibrated to 114.0 dB at a frequency of 1,000 Hz using a 3M AC-300 acoustic calibrator (SN-AC-300001469). Post calibration result was 114.0 dB.

LEGEND

- MEXICHEM PROPERTY BOUNDARY
- 91.2 NOISE LEVEL SAMPLE LOCATION (dB)

NOISE LEVEL (dB)

- < 80
- 80-84
- > 85

Formula for Calculating Hearing Protection Attenuation

- Single Protection (Ear Muffs or Plugs)
  Estimated Exposure (Dba) = Sound Level (Dba) - [(NRR-7) x 50%]
- Dual Protection (Ear Muffs and Plugs)
  Estimated Exposure (Dba) = Sound Level (Dba) - {[(NRR$_h$-7) x 50%] + 5}

NRR = Noise Reduction Rating
NRR$_h$ = Noise Reduction Rating for the Higher Rated Protection
dBA = Decibels, A-Weighted

No.	Issue	Drawn	Approved	Date
-	-	-	-	-

0 40 80 ft

Bar is one inch on original size drawing
0 1"

GHD
455 Phillip Street
Waterloo Ontario N2L 3X2 Canada
T 519 884 0510 F 519 884 0525 W www.ghd.com

Drawn		Designer	
Drafting Check		Design Check	
Project Manager		Date	May 11, 2018
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN

Client MEXICHEM FLOUR, INC.
Project 4990 B ICI ROAD, ST. GABRIEL, LOUISIANA
Title NOISE CONTOUR MAP DWG. NO. 101-06
Project No. 11147761-00
Original Size ANSI D
Sheet No. Figure 1
Sheet 1 of 1

Plot Date: 11 May 2018 - 11:24 AM Plotted By: Gerry Balzer CAD File: P:\drawings\11147000s\11147761\11147761-pres\11147761-00(PRES002)\11147761-00(PRES002)GN\11147761-00(PRES002)GN-WA007.dwg