# Lapis Carbon Solutions (LA Development), LP

# Proposed Injection Well Pad, Access Road, Receiving Facility, and Pipeline

***Louisiana Department of Energy and Natural Resources***

***Office of Coastal Management***

***Coastal Use Permit Application P20240989***

## *Level 2 Hydrologic Modification Impact Analysis*

***January 2025***

| Revision | Date | Reason for Issuance | Prepared By | Approved By |
|---|---|---|---|---|
| 001 | 05/08/2025 | Update per OCM request | RJG | |
| | | | | |

The Louisiana Department of Natural Resources, Office of Coastal Management (LOCM) issued a request for additional information requiring the applicant to submit a Level 2 Hydrologic Modification Impact Analysis (HMIA). This HMIA report has been prepared in accordance with Section 2.3 of the LOCM HMIA guidelines. The project under review is a proposed injection well pad and associated access road, receiving facility, and 16-inch pipeline

## Project Site Hydrology

1. ***A map showing the existing and proposed water flow patterns.***

The map showing the existing and proposed flow patterns is included as **Attachment A**.

2. ***Identification of the design storm event and the drainage network to be impacted.***

LOCM HMIA Guidelines do not require applicants to use an agency-designated design storm classification. Louisiana Department of Transportation and Development uses a 5-year average recurrence interval for minor projects, and because the development proposed in P20240989 would be classed as a minor project, a 5-year recurrence interval 2-day design storm has been utilized for this assessment. The National Oceanographic and Atmospheric Administration has calculated for the Des Allemands weather station that a 5-year recurrence interval 2-day design storm results in precipitation in the amount of 8.03 inches (see **Attachment B**).

The Project site is in a floodplain. According to Federal Emergency Management Agency data the location falls within Zone AE (FIRM Panel ID 220160 0200 C). The base flood elevation in the area is 5 to 6 feet. According to the St. Charles Parish Zoning Map, the area is zoned as wetlands. The nearest residential areas (Des Allemands, Paradis and Bayou Gauche) are all located within the Sunset Drainage District Levee.

The proposed project is located within a freshwater marsh area that is flat with no discernable change in elevation. (see elevation profiles at **Attachment C**). There is no drainage network to be affected.

The leased area is bounded by the Salvador Wildlife Management Area 1.25 miles to the east, Bayou Des Allemands 2.25 miles to the south, and the Bayou Gauche community 2.25 miles to the

west. The site is in a large freshwater marsh area. As proposed, Project Libra will make use of ± 8.25-miles of an existing access road system designed for heavy hauling from State Highway 306 to the lease approach and within the leased area itself. The access roads have been in existence since the late 1950s. There is no visual evidence of adverse hydrologic impacts (i.e., change in vegetative communities, conversion of marsh to open water, etc.) in historic aerial photographs resulting from oil and gas operations or other activities. Aerial images depict faint vestiges from past activities; however, minimal to no evidence of these activities can be observed onsite. Many of these former roads and pad sites have subsided below the surface of the marsh.

To minimize any potential adverse impacts to surface hydrology in the area of new construction, Lapis proposes to install 24-inch culverts at 250-foot intervals along the newly constructed road [a total of 17 culverts] to maintain surface sheet flow. In addition, at existing waterway (trenasse) crossings (2) 36-inch culvert bundles at each crossing will be installed so as not to prohibit flow within those shallow water features.

3. ***Information relative to the pre- and post-project volume rate of runoff expected for the design storm event.***

There is no anticipated change to pre- and post-project volume runoff in the Project Area. The proposed project is located within a freshwater marsh that is flat with no discernable change in elevation. The Project site is in a floodplain. According to Federal Emergency Management Agency data the location falls within Zone AE (FIRM Panel ID 220160 0200 C). The base flood elevation in the area is 5 to 6 feet. According to the St. Charles Parish Zoning Map, the area is zoned as wetlands.

4. ***Information on the pre-and post-project hydrologic conditions, including at the minimum, local topography, slope, surface condition drainage pattern, response to storm events, etc.***

Project site and surrounding topography is flat and absent slope. Surface water introduced into the proposed project area will be primarily from precipitation. There is some tidal influence (amplitude of 0.2 ft) from Bayou Gauche and Bayou Des Allemands in the southernmost portion of the project area. Because the project area lacks topography, well-defined natural drainage patterns do not exist. Following a large rainfall event, the anticipated surface flow would be southerly toward Bayou Des Allemands and eventually into Lake Salvador. The flow volume and direction should not be significantly different between pre-and post-conditions (See **Attachment B**).

5. ***A discussion of how the runoff identified in # 4 above will affect adjacent and other properties and the existing drainage network.***

As stated in response #2, the Project Site is situated near the center of the 14,000 acre surface lease, runoff will not have an effect on adjacent properties or drainage networks.

6. ***Identification of measures to be taken to lessen impact on adjacent and other properties and the existing drainage network.***

The Project is contained within a single owner surface lease approximately14,000 acres in size. The Project area is located centrally within the lease. The Project is bounded by the Salvador Wildlife Management 1.25 miles to the east, Bayou Des Allemands 2.25 miles to the south, and the community of Bayou Gauche 2.25 miles to the west. The Project will have no impact to adjacent properties or drainage networks. As described in response 4 above, the Project site and surrounding topography is flat and absent of slope. Surface water introduced into the proposed project area will be primarily from precipitation. There is some tidal influence (amplitude of 0.2 ft) from Bayous Gauche and Des Allemands in the southernmost portion of the project area. Because the project area lacks topography, well-defined natural drainage patterns do not exist. No measures are proposed.

## Water Quality

1. ***Identification of water quality parameters to be affected by the proposed development (TSS and other applicable parameters).***

The Project is not anticipated to significantly affect water quality in the surrounding area. A temporary increase in turbidity may occur directly adjacent to and only during the construction activity. However, turbid surface water will be isolated by the marsh vegetation to the immediate proximity of the activity and not affect any water bodies (e.g., Bayou Des Allemands, Lake Salvador).

During construction operations, including drilling operations, the road surface will be overlain by multiple layers of board mats. The mats represent an impervious surface. Upon completion of construction activities, rock or gravel will be placed on the road surface for stabilization. The rock/gravel surface will allow some minor infiltration of precipitation; however, the height water table, relative to the road surface, will limit permeability. It should be noted that the proposed Receiving Facility, Access Road, and the Injection Pad site are the only new construction activities. The remainder of the access road has been in existence since the late 1950s. In addition, the Injection wells will be drilled on a leveed drill pad using a closed loop system which will significantly reduce surface runoff.

**2.** ***Identification of the steps, procedures and/or BMPs to be used to lessen point source and non-point source impacts on surface water quality.***

As stated in response #1 above, the adjacent marshland will minimize the effects of point source turbidity to the immediate proximity of the activity. The proposed project will not affect any water bodies (e.g., Bayou Des Allemands, Lake Salvador). No steps, procedures, or BMPs are proposed to lessen impacts to surface water quality.

***3. Identification of the necessary permits to be obtained from other federal, state, and local authorities.***

In addition to OCM, permits have been applied for with the U.S. Army Corps of Engineer – New Orleans District (§404 - MVN-2025-00066-EMM), LDENR – Office of Conservation (UIC VI application), LDEQ – Water Quality Certification (WQC 250317-01), and St. Charles Parish.

**4.** ***Inclusion of the in-place spill response plan for the release of oil and grease (marinas only).***

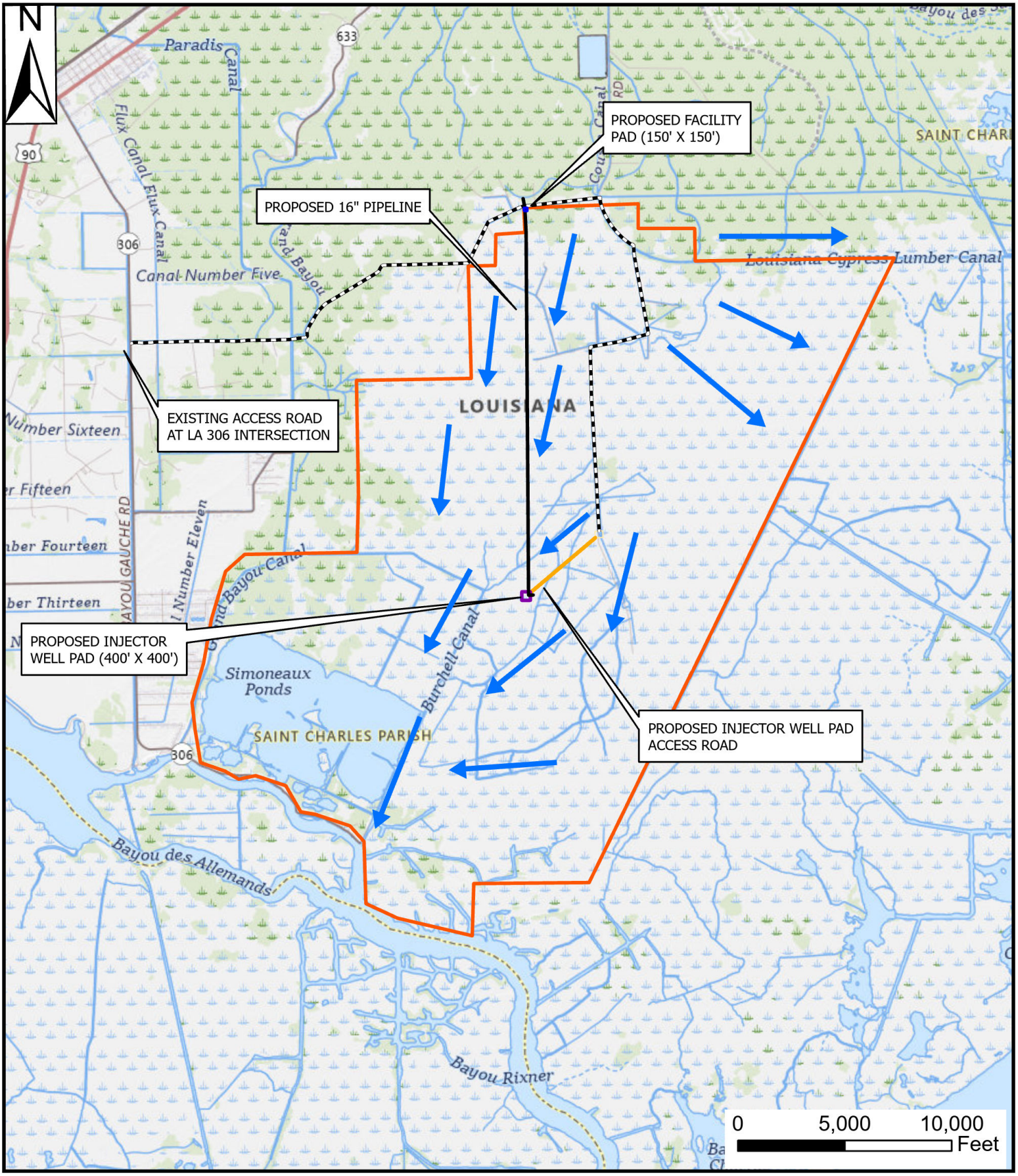
NA. The proposed project **is not** a marina.

An Emergency and Remedial Response Plan (ERRP) was prepared to meet the requirements of Statewide Order (SWO) 29-N-6, §623 [Title 40, US Code of Federal Regulations (40 CFR) §146.94]. The plan describes potential adverse events that could occur in the development, operation, and post-closure phases of the project and the actions to be taken in the event of such an emergency. This information was submitted to the LDENR, OC with the UIC VI permit application.

For the construction phase Lapis will apply to LDEQ for a construction stormwater general permit (LAR100000), and a hydrostatic test permit (LAR670000). For operations Lapis will apply for a Multi-Sector General Stormwater permit (LAR050000) and develop a Stormwater Pollution Prevention Plan as required by the LDEQ.

# Attachment A

Existing and Proposed Flow Pattern Map




Simoneaux Lease Boundary

Surface Flow

# SURFACE WATER FLOW MAP

LIBRA CO2 STORAGE SOLUTIONS PROJECT
ST. CHARLES PARISH, LOUISIANA
SECTIONS 31 & 32, T14S-R21E

NAD 1983 StatePlane Louisiana South FIPS 1702 Feet, 8.5X11, 1/24/2025
Prepared By: MJF

# Attachment B

Page from Precipitation Frequency Data Server

**NOAA Atlas 14, Volume 9, Version 2**
**Location name: Des Allemands, Louisiana, USA***
**Latitude: 29.8159°, Longitude: -90.3588°**
**Elevation: 2 ft****
* source: ESRI Maps
** source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

## PF tabular

**PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]**

| Duration | Average recurrence interval (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | **0.548** (0.444-0.682) | **0.634** (0.514-0.790) | **0.778** (0.627-0.971) | **0.899** (0.720-1.13) | **1.07** (0.824-1.38) | **1.20** (0.902-1.56) | **1.34** (0.965-1.78) | **1.47** (1.02-2.01) | **1.66** (1.10-2.31) | **1.80** (1.16-2.55) |
| 10-min | **0.802** (0.651-0.998) | **0.929** (0.752-1.16) | **1.14** (0.919-1.42) | **1.32** (1.06-1.65) | **1.56** (1.21-2.01) | **1.76** (1.32-2.29) | **1.96** (1.41-2.60) | **2.16** (1.49-2.94) | **2.43** (1.60-3.39) | **2.64** (1.69-3.73) |
| 15-min | **0.979** (0.793-1.22) | **1.13** (0.917-1.41) | **1.39** (1.12-1.73) | **1.60** (1.29-2.01) | **1.91** (1.47-2.46) | **2.14** (1.61-2.79) | **2.38** (1.72-3.17) | **2.63** (1.81-3.58) | **2.96** (1.96-4.13) | **3.22** (2.06-4.55) |
| 30-min | **1.48** (1.20-1.84) | **1.73** (1.40-2.16) | **2.14** (1.73-2.68) | **2.49** (2.00-3.12) | **2.97** (2.29-3.82) | **3.35** (2.51-4.36) | **3.72** (2.69-4.95) | **4.11** (2.83-5.60) | **4.63** (3.06-6.45) | **5.03** (3.22-7.10) |
| 60-min | **2.00** (1.62-2.49) | **2.31** (1.87-2.88) | **2.87** (2.32-3.58) | **3.38** (2.71-4.23) | **4.15** (3.23-5.41) | **4.79** (3.62-6.30) | **5.48** (3.98-7.36) | **6.23** (4.31-8.55) | **7.29** (4.83-10.2) | **8.15** (5.22-11.5) |
| 2-hr | **2.52** (2.06-3.11) | **2.89** (2.36-3.57) | **3.60** (2.93-4.45) | **4.27** (3.45-5.30) | **5.32** (4.20-6.94) | **6.24** (4.77-8.17) | **7.24** (5.32-9.68) | **8.34** (5.85-11.4) | **9.95** (6.67-13.9) | **11.3** (7.29-15.8) |
| 3-hr | **2.84** (2.33-3.48) | **3.24** (2.66-3.97) | **4.03** (3.29-4.95) | **4.82** (3.92-5.95) | **6.11** (4.88-7.99) | **7.27** (5.60-9.53) | **8.56** (6.34-11.4) | **10.0** (7.07-13.7) | **12.1** (8.20-16.9) | **13.9** (9.06-19.4) |
| 6-hr | **3.41** (2.82-4.14) | **3.88** (3.21-4.72) | **4.86** (4.00-5.91) | **5.85** (4.79-7.15) | **7.49** (6.04-9.73) | **8.97** (6.99-11.7) | **10.6** (7.97-14.1) | **12.5** (8.95-17.0) | **15.3** (10.5-21.2) | **17.7** (11.6-24.3) |
| 12-hr | **4.01** (3.35-4.82) | **4.63** (3.86-5.57) | **5.83** (4.84-7.03) | **7.00** (5.78-8.47) | **8.87** (7.18-11.3) | **10.5** (8.24-13.5) | **12.3** (9.29-16.1) | **14.4** (10.3-19.2) | **17.3** (11.9-23.6) | **19.8** (13.1-26.9) |
| 24-hr | **4.66** (3.93-5.55) | **5.46** (4.59-6.50) | **6.91** (5.78-8.24) | **8.24** (6.86-9.88) | **10.3** (8.35-12.9) | **12.0** (9.48-15.2) | **13.9** (10.5-17.9) | **16.0** (11.6-21.0) | **18.9** (13.1-25.4) | **21.3** (14.3-28.8) |
| 2-day | **5.40** (4.59-6.37) | **6.35** (5.38-7.48) | **8.03** (6.78-9.49) | **9.56** (8.03-11.3) | **11.9** (9.69-14.7) | **13.8** (10.9-17.2) | **15.9** (12.1-20.2) | **18.1** (13.2-23.5) | **21.2** (14.9-28.2) | **23.8** (16.1-31.8) |
| 3-day | **5.88** (5.01-6.88) | **6.90** (5.88-8.09) | **8.74** (7.42-10.3) | **10.4** (8.78-12.3) | **12.9** (10.6-15.9) | **15.0** (12.0-18.6) | **17.3** (13.3-21.8) | **19.7** (14.5-25.5) | **23.2** (16.3-30.6) | **26.0** (17.7-34.5) |
| 4-day | **6.25** (5.35-7.29) | **7.32** (6.26-8.54) | **9.24** (7.87-10.8) | **11.0** (9.31-12.9) | **13.6** (11.3-16.7) | **15.9** (12.7-19.6) | **18.3** (14.1-23.0) | **20.9** (15.4-26.9) | **24.6** (17.4-32.3) | **27.6** (18.9-36.5) |
| 7-day | **7.18** (6.19-8.30) | **8.29** (7.14-9.59) | **10.3** (8.84-12.0) | **12.2** (10.4-14.2) | **15.0** (12.5-18.3) | **17.4** (14.1-21.4) | **20.0** (15.6-25.0) | **22.9** (17.0-29.2) | **26.9** (19.2-35.2) | **30.2** (20.9-39.7) |
| 10-day | **8.07** (6.99-9.29) | **9.23** (7.98-10.6) | **11.3** (9.75-13.1) | **13.2** (11.3-15.3) | **16.2** (13.5-19.5) | **18.6** (15.1-22.7) | **21.3** (16.7-26.5) | **24.2** (18.1-30.8) | **28.4** (20.3-36.8) | **31.7** (22.0-41.4) |
| 20-day | **10.9** (9.53-12.4) | **12.3** (10.7-14.0) | **14.7** (12.8-16.8) | **16.9** (14.6-19.3) | **20.0** (16.7-23.7) | **22.5** (18.4-26.9) | **25.2** (19.8-30.7) | **28.0** (21.1-35.0) | **31.9** (23.0-40.8) | **35.0** (24.5-45.2) |
| 30-day | **13.3** (11.7-15.1) | **15.0** (13.2-17.0) | **17.8** (15.5-20.2) | **20.1** (17.5-22.9) | **23.4** (19.7-27.4) | **26.0** (21.3-30.8) | **28.7** (22.7-34.7) | **31.4** (23.8-38.9) | **35.1** (25.5-44.5) | **38.0** (26.8-48.8) |
| 45-day | **16.4** (14.5-18.4) | **18.4** (16.2-20.7) | **21.7** (19.0-24.4) | **24.3** (21.2-27.6) | **28.0** (23.5-32.4) | **30.7** (25.3-36.1) | **33.5** (26.6-40.1) | **36.2** (27.5-44.4) | **39.8** (29.0-50.0) | **42.5** (30.2-54.3) |
| 60-day | **19.0** (16.8-21.2) | **21.3** (18.8-23.8) | **25.0** (22.0-28.0) | **27.9** (24.5-31.5) | **31.9** (26.9-36.7) | **34.9** (28.8-40.7) | **37.8** (30.1-45.0) | **40.7** (31.0-49.6) | **44.4** (32.4-55.4) | **47.0** (33.5-59.8) |

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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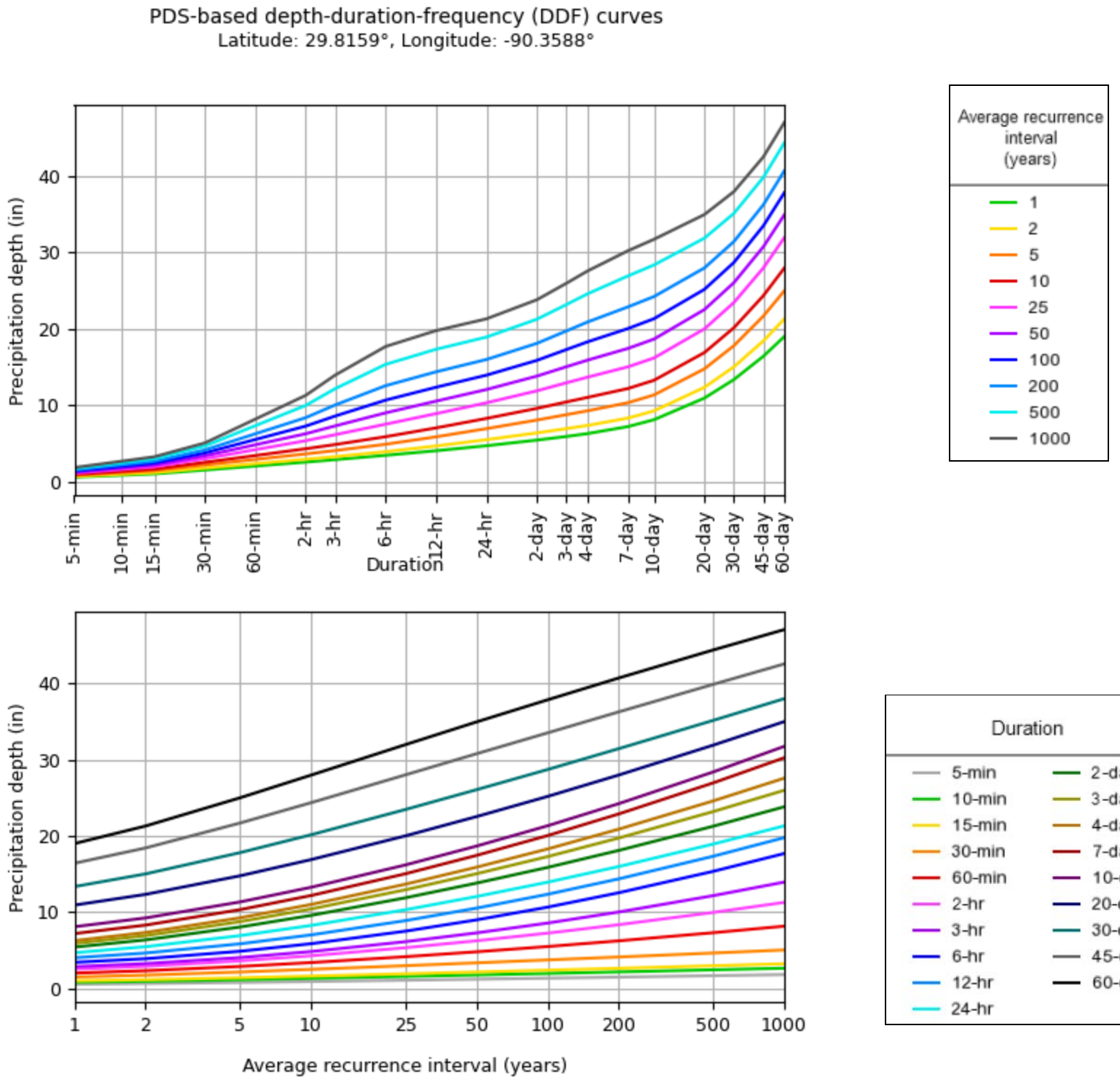
## PF graphical

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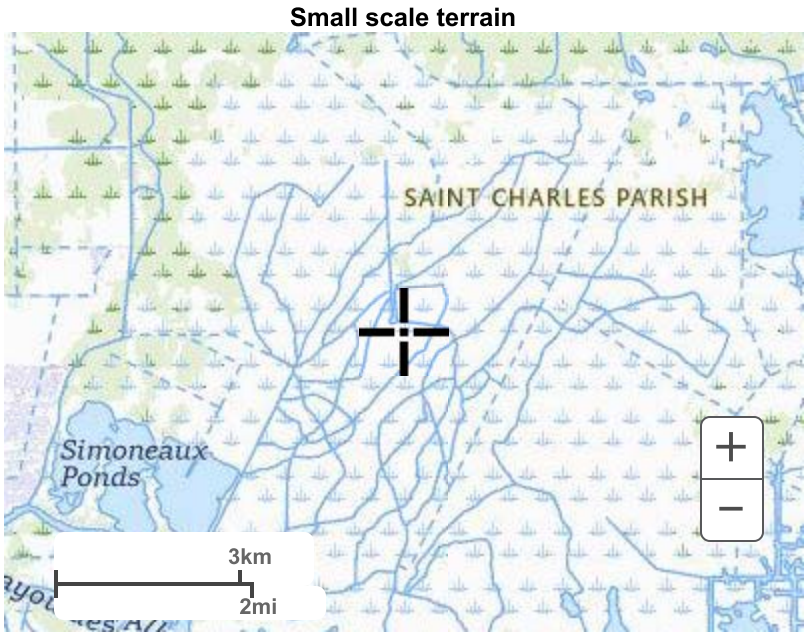
## Maps & aerials

**Small scale terrain**




**Large scale terrain**

**Large scale map**


**Large scale aerial**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National Oceanic and Atmospheric Administration
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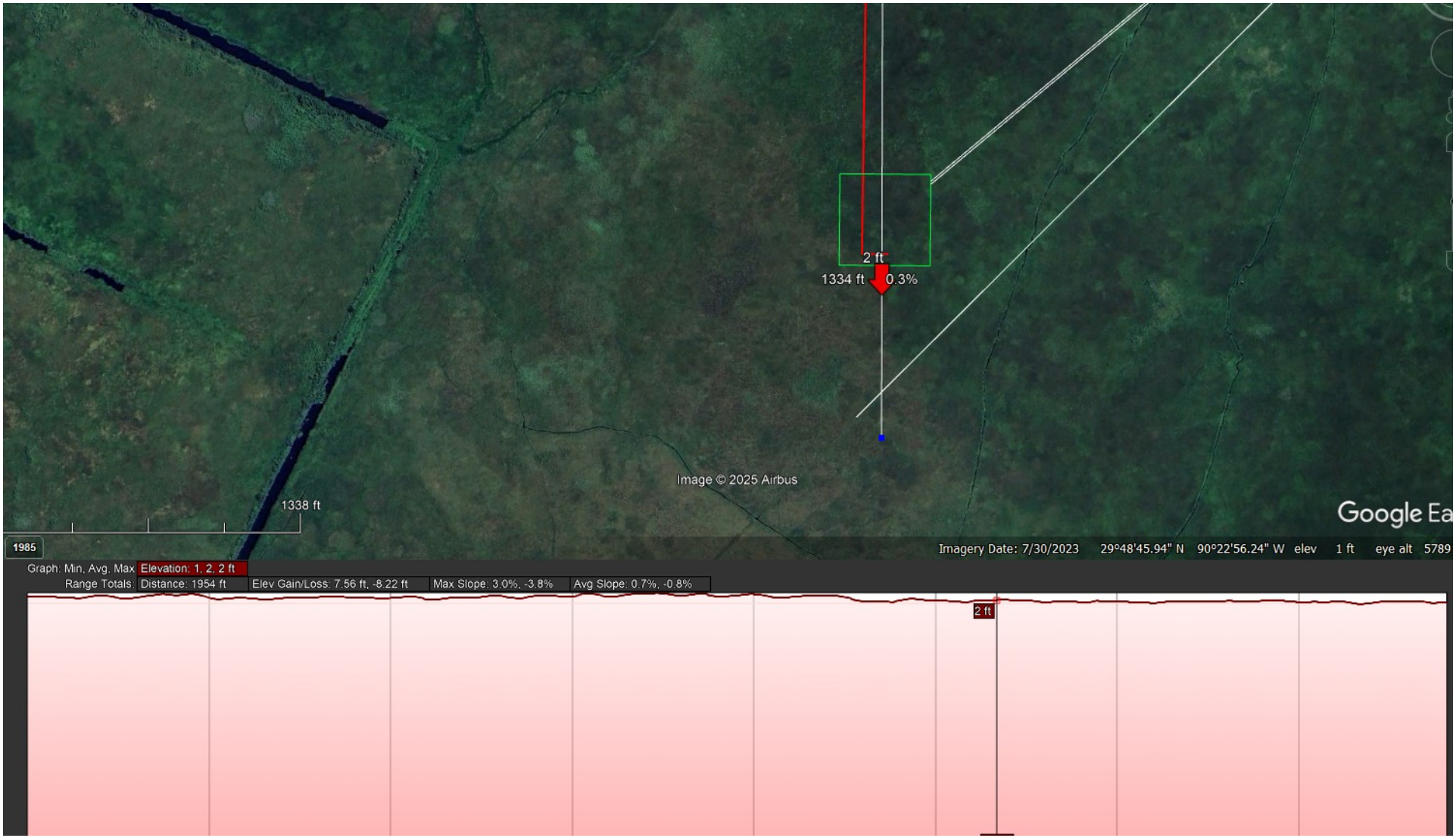
Disclaimer

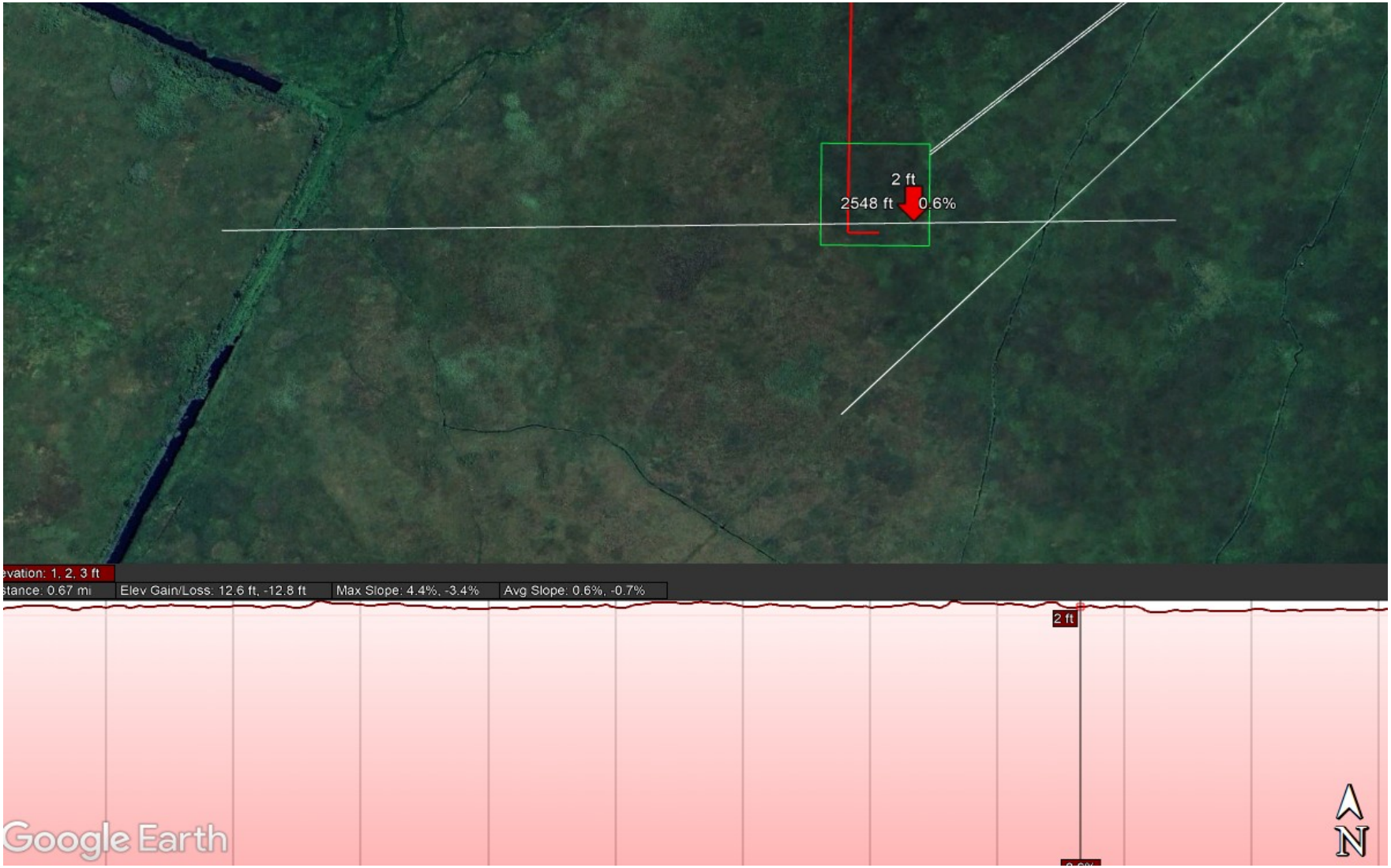
# Attachment C

Elevation Profiles

Profile – Drill Pad North/South



Profile – Drill Pad East/West



# Profile - Receiver N/S

# Profile - Receiver E/W