



Gandy Megasite

Robstown, Texas

Corpus Christi Regional EDC

Corpus Christi, Texas

Terracon Project No. GR195155

May 22, 2019



This Stage1 report was originally delivered on our web-based **GeoReport®** platform.

For more interactive features, please view your project online at client.terracon.com.

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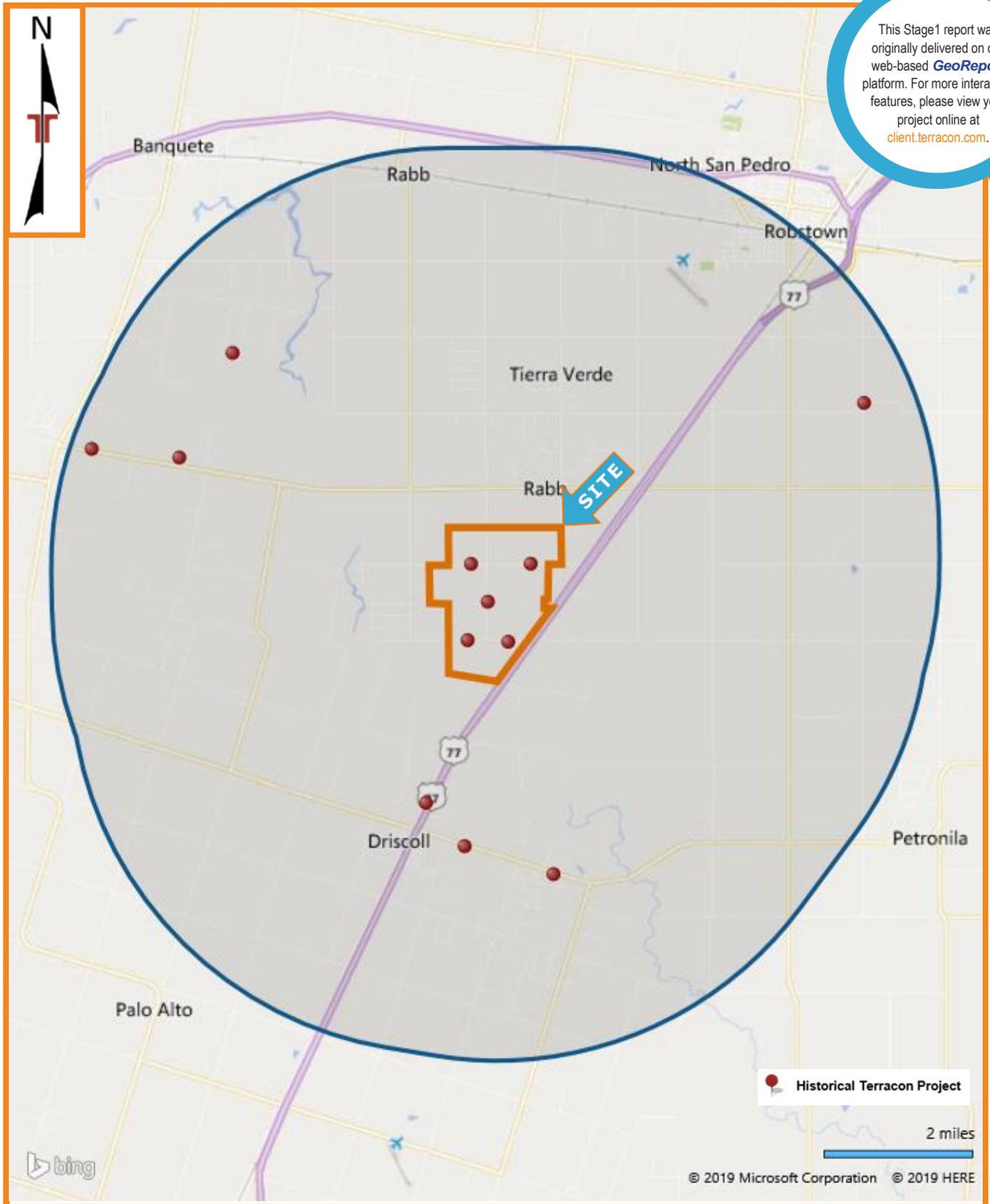
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This document presents a preliminary opinion of geotechnical conditions under the authority of Gregory P. Stieben, License Number 59536, on May 22, 2019. It is not to be used for design or construction purposes.

The engineering opinion included with this signature is our recommended exploration plan only. Opinions of the expected conditions and foundation or construction considerations, and **any related opinions are preliminary and cannot be considered an engineer's work product until confirmed by the TERRACON EXPLORATION PLAN.**

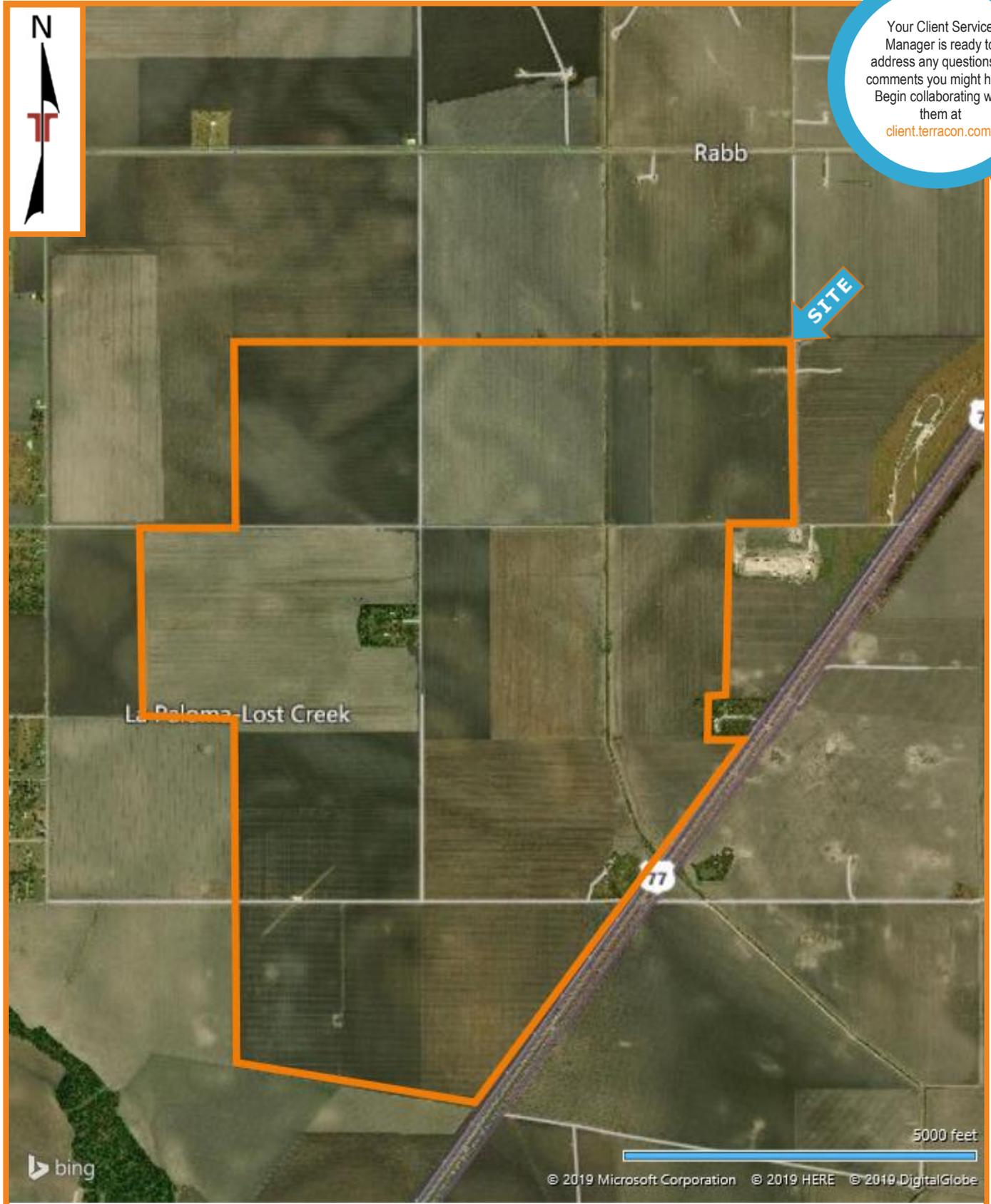
SITE CHARACTERISTICS

SITE LOCATION AND NEARBY HISTORICAL GEOTECHNICAL DATA



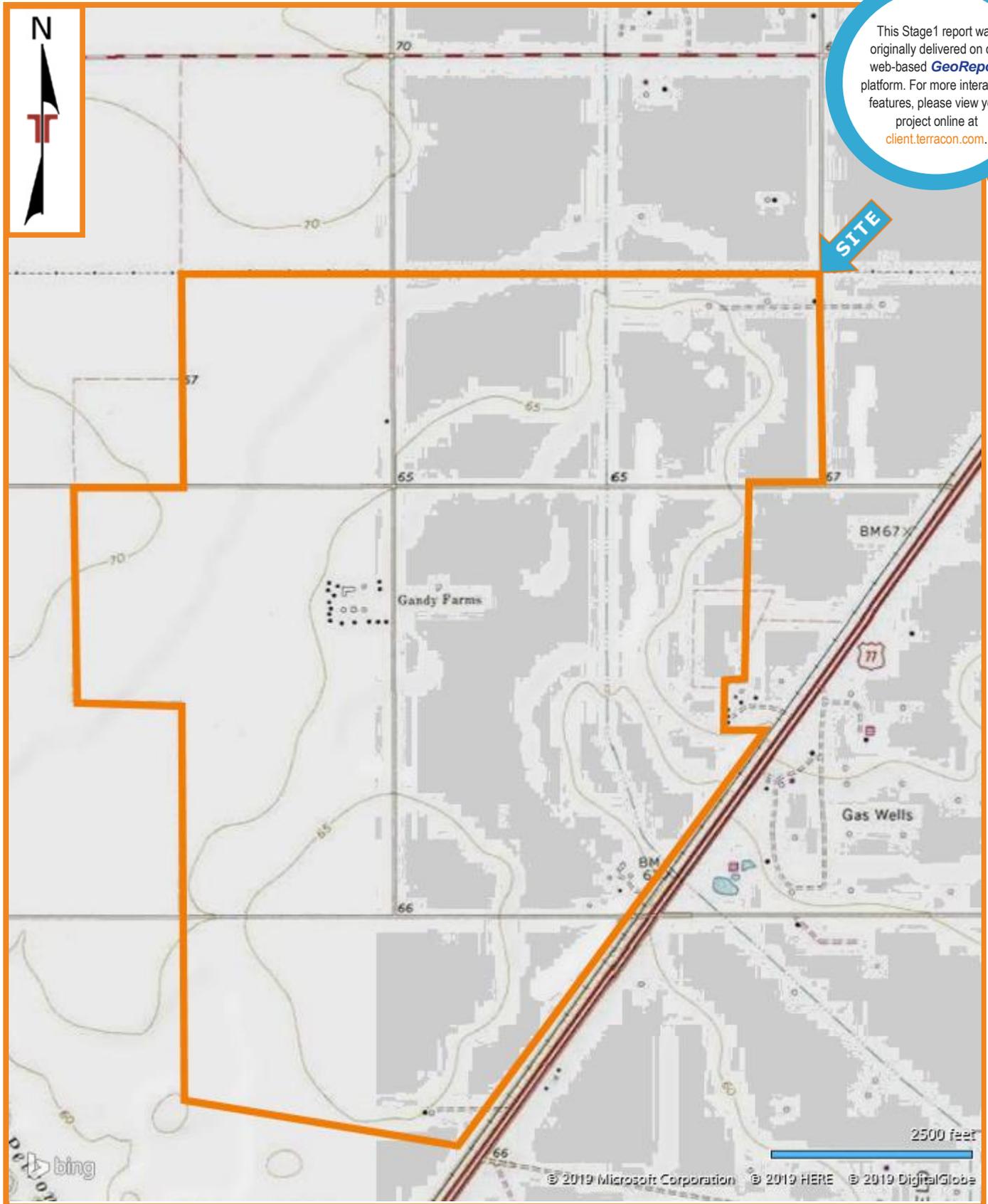
See **INFORMATION SOURCES** for a detailed list of sources used to generate this figure.

SITE CONDITIONS



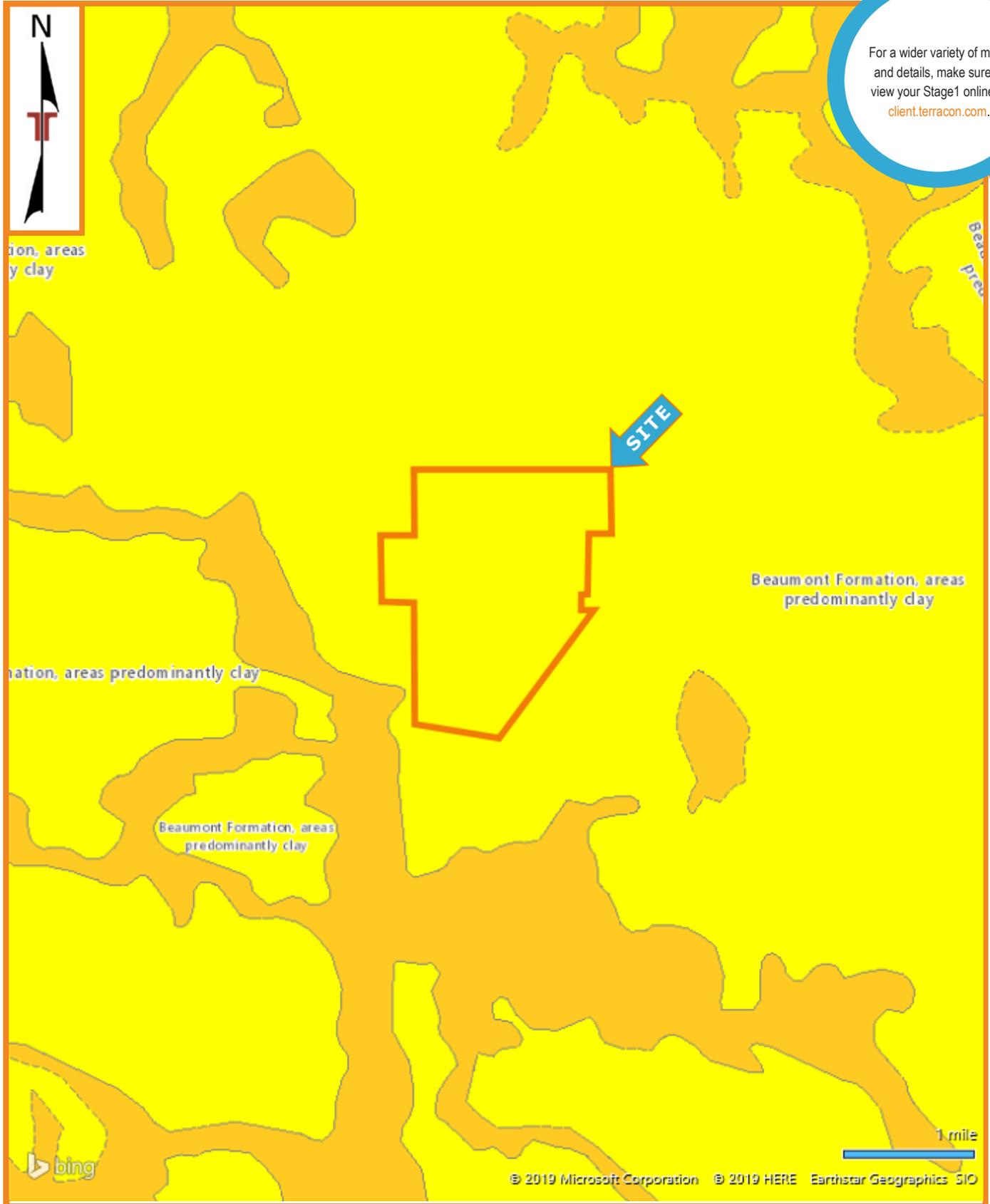
See [INFORMATION SOURCES](#) for a detailed list of sources used to generate this figure.

SITE TOPOGRAPHY



See **INFORMATION SOURCES** for a detailed list of sources used to generate this figure.

SITE GEOLOGY



See **INFORMATION SOURCES** for a detailed list of sources used to generate this figure.

PLANNED CONSTRUCTION

INFORMATION PROVIDED

- Project location provided by Corpus Christi Regional EDC via email.

PROJECT DESCRIPTION

- The approximately 1,650-acre site is being considered for future development.

PREVIOUS SITE USAGE

HISTORICAL AERIAL IMAGES

Terracon reviewed the following readily available historical aerial images available from Google Earth Pro™ to develop a limited history of previous site usage.

- Aerial Images: 20 images from 1956 to 2017 were reviewed.

HISTORICAL AERIAL IMAGES SUMMARY

The site is primarily agricultural land with two homesteads, one in the central portion and one adjacent to the southeast boundary of the site. Historical photographs revealed a few other smaller homesteads that have been demolished over time.

HISTORICAL AERIAL IMAGERY USAGE

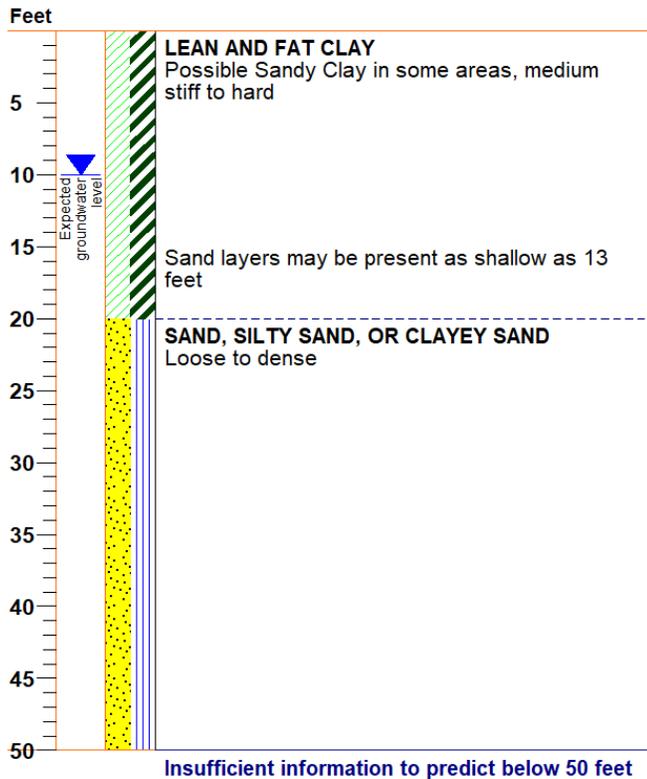
The use of these readily available aerial imagery resources, while helpful to understand previous site usage, should not be considered suitable for detecting any prior site usage that may have affected the site subsurface conditions. These images are widely spaced in time, and a more comprehensive review of aerial imagery and/or site interviews would be required to better understand previous site usage.

CONCEPTUAL GEOTECHNICAL MODEL

The following opinion of expected geotechnical conditions must be validated with a geotechnical engineering evaluation, fieldwork, and testing. See **LIMITATIONS** for additional information. This discussion is preliminary in nature and not for design purposes. In no case should the information or opinions provided in this report be utilized for final design.

AREA REPRESENTED: Entire site.

EXPECTED LITHOLOGY



FOUNDATION DESIGN CONCEPTS

- Shallow foundation support is typical for loads up to 100 kips or 3 klf.
- For heavier structures and column loads greater than 100 kips, deep foundations like drilled shafts or ACIP will likely be appropriate.
- Slab of Grade will require building pad preparation to reduce the Potential Vertical Rise (PVR) to an acceptable level.
- This area is usually a Seismic Site Class D.

ADDITIONAL SITE CONSIDERATIONS

- A cursory review of the (publicly available) historical images indicates that the site is primarily agricultural land for the duration of the timeframe reviewed.
- Agricultural activities disturb upper material resulting in soft material, likely requiring stabilization especially during wetter cooler periods of the year. This may include lime or use of other admixtures. Due to the agricultural nature of the site, the near-surface topsoil may be relatively thick, possibly about 1 to 2 feet.

CONFIDENCE

The project geotechnical engineer has assigned confidence estimates for the datasets below. For information regarding the confidence levels below, see **CONFIDENCE ESTIMATE**.

LOCAL EXPERIENCE: HIGH	Local practitioners have 43 years of combined experience in the vicinity of the site.
PUBLIC DATA: HIGH	Sufficient data exists for this site.
HISTORICAL DATA: HIGH	4 exploration projects were reviewed within 5-miles of the site.
OVERALL CONFIDENCE:	HIGH

CONCEPTUAL GEOTECHNICAL MODEL (CONTINUED)

CONSTRUCTION CONSIDERATIONS

- NRCS SSURGO Depth to Water map indicates very shallow groundwater may be present in a small area in the center of the site. Based on surrounding projects, groundwater depths between 10 to 15 feet below grade are possible. If encountered, shallow groundwater could inhibit or increase the costs associated with construction of below grade structures. If below grade facilities are planned, installation of temporary piezometers in the area is recommended.
- Surficial soils are expansive and prone to shrink-swell. These soils are prone to volume change with variations in moisture content resulting in floor slab movements, cracked slabs and walls, and roof leaks.
- The overburden soils are expected to be excavatable by conventional earth moving equipment.
- The subgrade soils may become unstable when disturbed during period of wet season. Overexcavation and/or subgrade stabilization may be required due to potentially unstable and/or soft conditions.
- Compaction may be hindered by pumping of expansive surficial soils during wet seasons.
- The site is not located in a frost zone.

TERRACON EXPLORATION PLAN

- 1 boring per 5000 square foot of building or structure footprint.
 - Building borings should extend to 20 feet for lightly loaded structures and about 50 to 70 feet deep for structures with loads up to 250 kips.
- 1 pavement boring to 6 feet every 200 linear feet.
- For storage tanks, typically 3 to 5 borings are drilled per tank, depending on the diameter. The center boring is typically advanced to a depth of about 100 feet with edge borings being shallower.
- (Note - Consideration can be given to substituting Cone Penetrometer Tests (CPT) for many of the borings. This can result in significant cost saving to the owner.)
- Planned lab work includes Moisture content, Atterberg Limits, Minus 200 Sieve, Unconfined Compression Test, Dry Unit Weight, and Consolidation tests.
- Sampling of clay soils shall consist of Shelby Tube sampling to a depth of 10 feet, then every 5 feet thereafter.
- Split spoon samples shall be obtained in sandy soils at similar intervals.

INFORMATION SOURCES

TERRACON HISTORICAL PROJECTS

Terracon has approximately 9 geotechnical projects within 5-miles of your project site. Of those, the local practitioner reviewed 4 exploration projects to gain a better understanding of potential subsurface conditions. The geotechnical project locations are illustrated on the [GeoReport](#) platform, and on the [SITE LOCATION MAP](#).

PUBLIC DATA SOURCES



TOPOGRAPHY
GEOLOGY



Soil Survey Geographic U.S. Database

DEPTH TO BEDROCK
DEPTH TO WATER
FLOOD FREQUENCY
SOIL HYDRO GROUP
SOIL PARENT MATERIAL

OTHER

BING MAPS
GOOGLE EARTH PRO™ (Historical Aerial Images)

METHOD

The **CONCEPTUAL GEOTECHNICAL MODEL** developed for the subject site provides expected subsurface (lithology and groundwater) conditions as well as site preparation and foundation options based upon the expected subsurface conditions and our understanding of the planned construction.

It is based upon Terracon's review of information from selected sources within the public domain, historical subsurface exploration and testing data in the vicinity of the project site and the experience of Terracon's local practitioners.

If sufficient site development plans are available, a work plan required to confirm the Conceptual Geotechnical Model is included. The work plan is intended to be executed by Terracon to confirm our Conceptual Geotechnical Model. The work plan may not be sufficient in scope for other geotechnical engineers.

CONFIDENCE ESTIMATE

Terracon has assigned confidence estimates for the datasets based on upon the engineer's local practice in the vicinity of your site. The engineer assigned a subjective confidence opinion of low, moderate, or high for each of the following categories:

- Local Experience
- Public Data
- Historical Project Data

Using a weighted averaging approach, we derived an overall confidence interval for all the combined information sources. Low confidence implies that the level of available data and/or consistency is such that little confidence can be placed in the Conceptual Geotechnical Model. Conversely, a high confidence ranking implies that sufficient data and consistency exists to derive a high confidence in the statement of expected conditions.

Regardless of the confidence ranking, actual conditions may vary significantly from the predicted conditions, and the expected conditions must be confirmed with site-specific exploration data, and significant variations from the expected conditions are possible.

The **CONCEPTUAL GEOTECHNICAL MODEL** is preliminary in nature and not for design purposes. Any opinions regarding the subsurface conditions for this project may not represent actual conditions encountered during project exploration, or construction. In no case should the information or opinions provided in this Stage1 be utilized for final design.

LIMITATIONS

The sources of publicly available information as provided in this Stage1 are identified in the Project Map Viewer and referenced in **INFORMATION SOURCES**. Terracon makes no warranty as to accuracy of any public information, as displayed in the viewer.

Confirmation of opinions stated in this document is essential. Confirmation should include performing a site-specific geotechnical evaluation consisting of exploratory soil borings and/or related exploration methods consistent with the guidelines set forth in the **TERRACON EXPLORATION PLAN**.

This Stage1 **GeoReport** addresses a preliminary, unverified opinion of geotechnical conditions only. The report does not include either specifically, or by implication, any environmental assessment of the site or identification or prevention of pollutants, hazardous materials, or conditions.

Furthermore, given the limitations described above, and based on the preliminary nature of this report, all parties are advised that any decisions or actions taken by any party based on the information contained herein, including decisions with financial implications are done solely at the risk of that party. By providing this information in this preliminary form, Terracon expressly disclaims any duties or obligations associated with the usage of this information for decision-making purposes.

In the event that changes the nature, design, or location of the project as outlined in this report are planned, the preliminary conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing. In the event the project moves into the design phase, Terracon should be retained to develop and complete a scope of work that includes site specific explorations to confirm or to modify this preliminary report.

Terracon and Corpus Christi Regional EDC recognize that we have entered into an agreement that may contain certain confidential or non-disclosure obligations relating to our services. Corpus Christi Regional EDC recognizes, however, that while Terracon will not violate any such obligations, none of these create an exclusivity obligation to Terracon relating to the service or data in question. Terracon has the unfettered ability to provide similar services to any other party and use any public or previously available data for the service of others, even if included as part of this report.

The review of historical aerial imagery is limited to the images available from Google Earth Pro™. Terracon does not represent the imagery reviewed to be a complete historical record of previous site usage.