Sinton Industrial Site

Latitude: 28.0431° N and Longitude: 97.4639° W
Sinton, Texas

Corpus Christi Regional Economic Development

Corpus Christi, Texas

Terracon Project No. GR205649

December 4, 2020

Your Stage1 Representative:

Tyler D. Grayson
Assistant Project Manager
Tyler.Grayson@terracon.com

SUMMARY OF FINDINGS

A summary for Geotechnical considerations is provided on the cover for your convenience. This summary of our Stage1 opinions is very general. Please refer to the details in the report.

GEOTECHNICAL SITE RATING

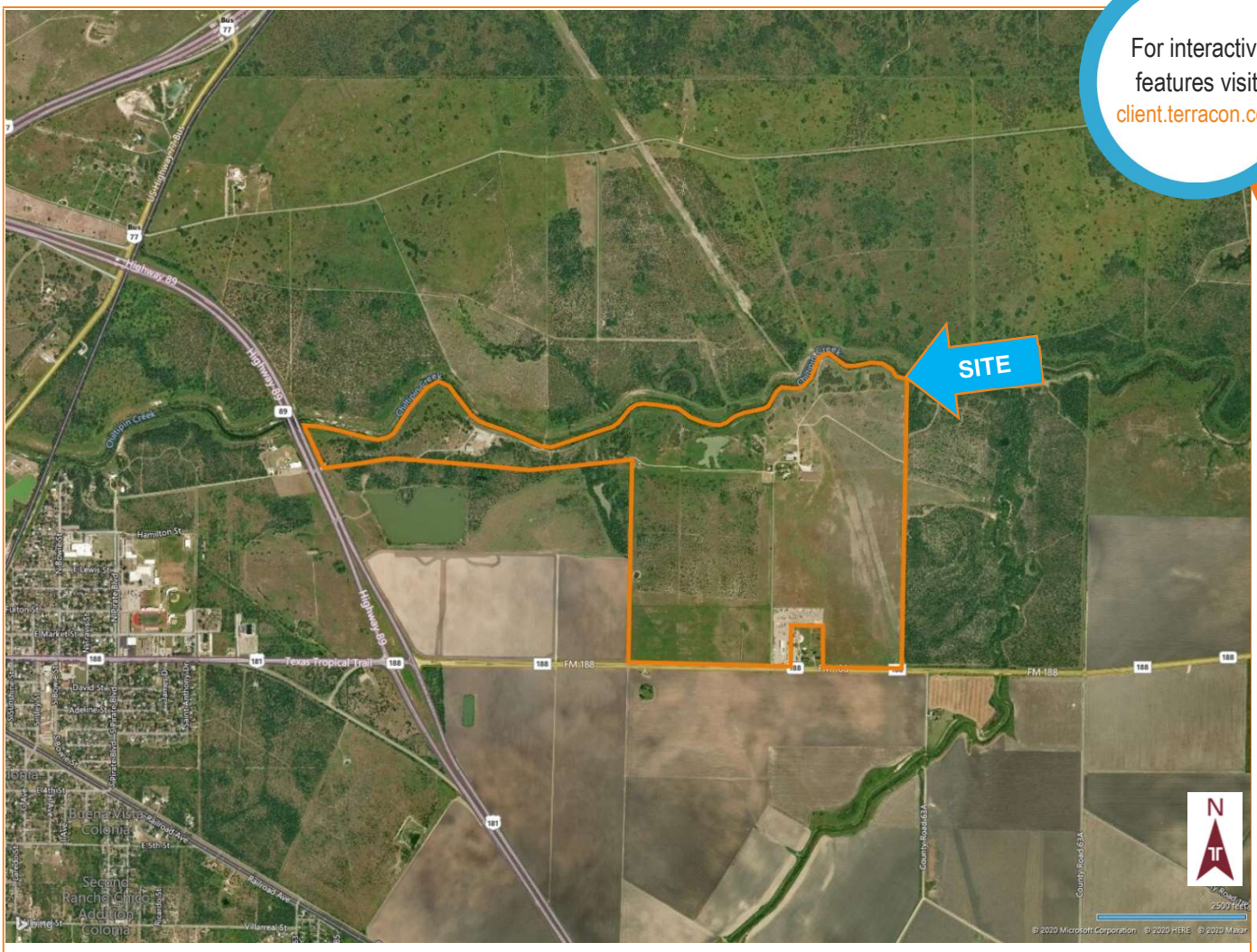
Site rating is based on expected subsurface conditions and the project, or in the event the project is not known, general constructability.

Site contains average constructability concerns. Typical construction for this project type is expected with some contingency for variation as described within this report.

YOUR SITE

DEVELOPMENT DESCRIPTION

- The proposed site covers approximately 570 acres and is planned to be a future industrial development. We understand that the development may contain extensive paved parking areas and driveways.



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

HISTORICAL AERIAL IMAGES SUMMARY

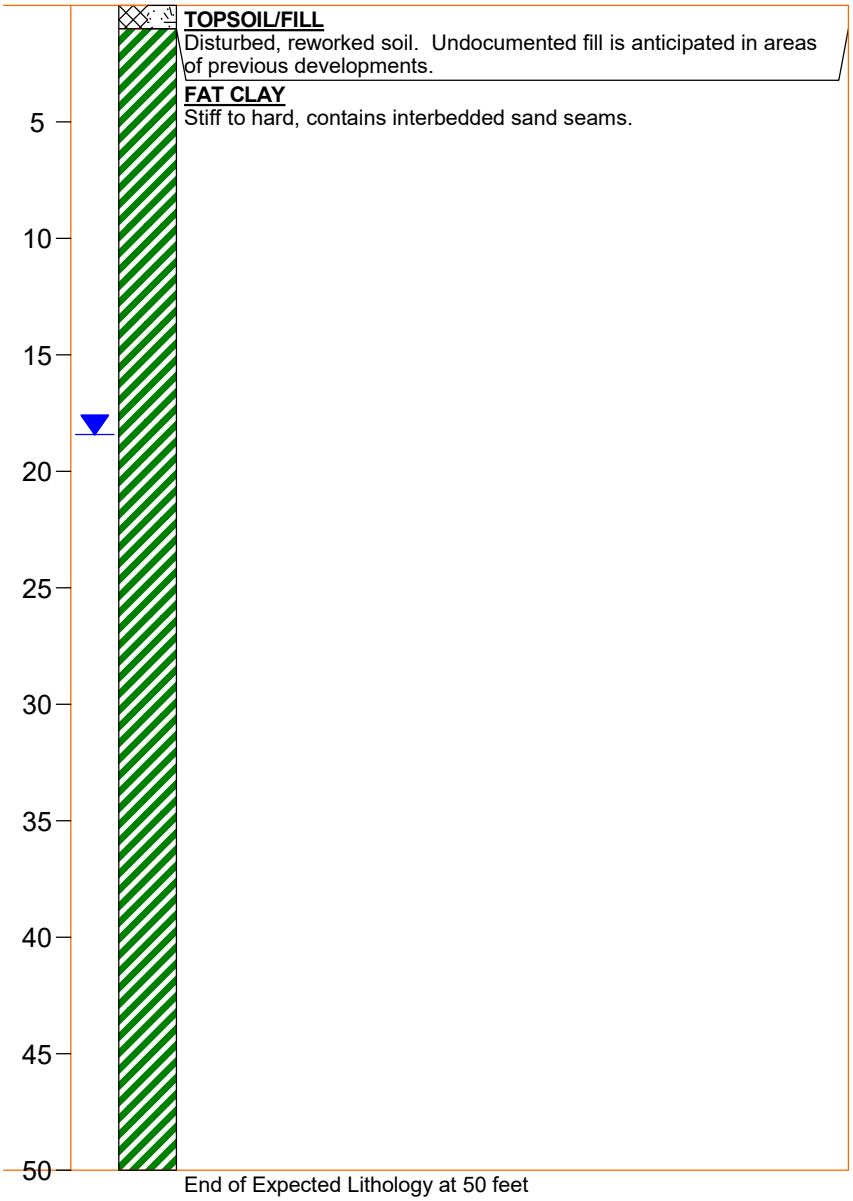
LOCATION	DESCRIPTION
Site	1950: The site appears to be primarily used for agricultural purposes. A few residential structures, outbuildings and other buildings associated with crop cultivation are apparent in the northern portion of the site. 1961: One apparent residential structure is visible in imagery in the southern portion of the site. 1961 – 2006: The site remained relatively unchanged. 2008: Highway 89 is visible in imagery west and adjacent to the site. 2010: One graded portion is visible in imagery in the western portion of the site. 2014: Structures are visible in imagery in the western graded portion of the site. 2014 – 2020: The site remained relatively unchanged from 2014 to 2020. Some development is currently underway adjacent to the site to the north.

GEOTECHNICAL CONSIDERATIONS

The EXPECTED LITHOLOGY noted below is subject to the CONFIDENCE ESTIMATE noted on the following page. The opinions of subsurface conditions are very preliminary in nature. These opinions must be validated with site-specific exploration and testing. See METHODOLOGY AND LIMITATIONS for additional clarification regarding the limitations to the following opinions and methods used to derive these opinions.

EXPECTED LITHOLOGY

Area Represented: Entire Site



MATERIAL DESCRIPTION

TOPSOIL/FILL
Disturbed, reworked soil. Undocumented fill is anticipated in areas of previous developments.

FAT CLAY
Stiff to hard, contains interbedded sand seams.

End of Expected Lithology at 50 feet

COMMENTS ON POTENTIAL VARIABILITY

- The site is mapped within the Coastal Plain Physiographic Provence of Texas. The site is mapped within the Beaumont Formation, which primarily consists of Quaternary clay, mud, and silt, although USGS mapping indicates the northern portion of the site is mapped within the Lissie Formation consisting of sands. Based on our experience, we believe the boundary of the Lissie formation likely follows the creek along the north side of the site. For the interpreted geology of the site, we are relying on the Geologic Atlas of Texas, Beeville-Bay City Sheet, 1987.
- Existing fill may be present at the project site in areas of previous developments. Thickness of fill will likely vary within these areas.
- Expansive soils are commonly encountered in this area. 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 presence of expansive soils will likely require over-excavation or chemical treatment to mitigate possible swell potential.
- Nearby geotechnical borings indicate evidence of groundwater at 18 feet below ground surface.

The EXPECTED LITHOLOGY was prepared as a part of this Stage1 report. It should not be utilized or distributed outside of this report. COMMENTS include, but are not limited to, potential variability of geology, lithology, and groundwater as noted.

CONFIDENCE ESTIMATE

We have used a weighted average approach, please refer to METHODOLOGY AND LIMITATIONS.

AVERAGE CONFIDENCE	We examined 3 historical projects within a 1 ¼ -mile radius.
AVERAGE CONFIDENCE	Available public data is consistent with our understanding of the area.
INCREASED CONFIDENCE	Practitioner has local experience in excess of 28 years.

SITE RATING

The site was evaluated for the presence or potential presence of the following geotechnical challenges: Shallow bedrock, soft soils, expansive soils, variable topography, previous site usage, seismicity, and underlying geologic conditions. Based on this evaluation we have assigned the Site a Site Rating as shown below. Please refer to our METHODOLOGY AND LIMITATIONS for more information about SITE RATING determination.

Due to the possible presence of uncontrolled fill in areas of previous development, and potentially expansive clays on site, we consider this site to have average constructability concerns and have assigned a Site Rating of 2.

FOUNDATION DESIGN

CONSIDERATIONS	
Shallow foundation support is likely acceptable for loads up typically associated with the planned construction.	Yes
Deep foundation support is likely for loads typically associated with the planned construction	Yes, for high column loads and industrial loading. Smaller structures and floor slabs are typically supported on grade on a prepared building pad.
Anticipated Seismic Site Class:	D

- Deep foundations may consist of conventional drilled piers, driven piles, or auger-cast-in-place piles (ACIPs). Auger cast displacement piles may also be considered to reduce cuttings returned to the surface.

SITE AND CONSTRUCTION CONSIDERATIONS

CONSIDERATIONS	
Anticipated excavation equipment:	Conventional
Frost embedment depth:	N/A
Concern for karst:	No, although the United States Geological Survey indicates the site is mapped within the Gulf Coast Salt Domes evaporite basin, we do not anticipate karst to pose a risk.
NRCS mapped potential for concrete corrosion due to on-site soils	Low to Moderate
NRCS mapped potential for steel corrosion due to on-site soils	Moderate to High
Mapped Faults on Site	No
Mapped Faults within 0.5-mile of Site	No
Mapped mines on Site	No
Mapped loess on Site	No

SITE AND CONSTRUCTION CONSIDERATIONS NOTES

- Based on publicly available topography maps published by the USGS, the site topography ranges from approximately elevation 50 feet to 15 feet NAVD88.
- A cursory review of the (publicly available) historical images indicated that the site has primarily been used for agricultural purposes. Agricultural activities disturb upper material resulting in soft/loose material, likely requiring stabilization.
- A cursory review of the (publicly available) historical images indicates that portions of the site were previously developed. There is an increased risk of encountering deleterious or unsuitable materials on a previously developed site.

GEOTECHNICAL CONSIDERATIONS and corresponding NEXT STEPS prepared by:

Gregory P. Stieben, P.E., D. GE
Authorized Project Reviewer / Senior Engineering Consultant
Greg.Stieben@terracon.com

This document presents a preliminary opinion of geotechnical conditions under the authority of Gregory P. Stieben, P.E., License Number 59536, on December 9, 2020. It is not to be used for design or construction purposes.

NEXT STEPS

GEOTECHNICAL

In order to characterize the subsurface conditions, we recommend geotechnical explorations of the site. Geotechnical explorations will provide the necessary sampling and testing to provide design parameter recommendations. The number of the borings, depths, and type of sampling will be dependent upon proposed construction, development, and use of the site.

GEOTECHNICAL EXPLORATION

- Based on our experience within proximity to the project site, we recommend that the geotechnical explorations on site include SPT borings and CPT soundings as follows:
  - Soil borings in building areas to depths of 30 to 60 feet.
  - Soil borings for pavements, if any, to depths of 5 to 10 feet.
  - Based on the size of the development, it may be beneficial to perform cone penetration testing (CPT).
- Laboratory testing of the soils obtained during field exploration will be required and include classification testing and swell testing.
- We recommend completing a Phase I ESA for the site if one has not already been performed.

INFORMATION SOURCES

TERRACON DATA	Terracon has 16 historical geotechnical projects within 5-miles of the Site. Of those, the local practitioner reviewed select exploration projects to gain a better understanding of potential subsurface conditions. The geotechnical project locations are illustrated on the Client Portal.
PUBLICLY AVAILABLE GIS DATA	Geologic Database of Texas
AERIAL IMAGERY	Terracon reviewed the following readily available historical aerial images and street view images available on December 2, 2020, to develop a limited history of previous Site usage: Aerial Images Google Earth Pro™ www.historicaerials.com Street View Images Google Maps, Google Earth Pro™ The use of available aerial imagery resources is intended to help understand previous Site usage. These images are widely spaced in time. They should not be considered appropriate for identifying Site activities which may have impacted subsurface conditions. A more comprehensive review of aerial imagery and/or site interviews would be required to further evaluate previous Site usage.
OTHER SOURCES	Geologic Atlas of Texas, Beeville-Bay City Sheet, 1987. http://www.twdb.texas.gov/groundwater/aquifer/GAT/

METHODOLOGY AND LIMITATIONS

LIMITATIONS

This report provides very preliminary opinions of siting and construction challenges that may be associated with the stated project plans for the stated property. Confirmation of opinions stated in this document is essential. Absence of a mapped resource does not mean that it is not present. Confirmation should include performing a site-specific evaluation consistent with the guidelines set forth in NEXT STEPS.

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 or design purposes.

In the event that changes to 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 used unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing. As the project moves into the design phase, Terracon should be retained to develop and complete a scope of work that includes site-specific explorations as noted in NEXT STEPS.

Terracon and Corpus Christi Regional Economic Development recognize we have entered into an agreement that may contain certain confidential or non-disclosure obligations relating to our services. Corpus Christi Regional Economic Development recognizes, however, that although such confidentiality obligations may be in place, those obligations do not create an exclusive relationship between the parties nor do those obligations create an exclusive ownership right to Corpus Christi Regional Economic Development relating to the 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, but Terracon will refrain from disclosing confidential information of Corpus Christi Regional Economic Development which is provided by Corpus Christi Regional Economic Development to the extent required by any applicable non-disclosure agreement.

Terracon does not represent the imagery reviewed to be a complete historical record of previous Site usage, nor does Terracon validate the accuracy and sufficiency of the public domain sources that have been utilized.

METHODOLOGY

CONFIDENCE ESTIMATE OF EXPECTED LITHOLOGY

Terracon has assigned confidence estimates for the datasets based on upon the engineer's local practice in the vicinity of the Site. The engineer assigned a subjective confidence opinion of decreased, average, or increased for each of the following categories:

- Historical Project Data
- Local Experience
- Public Data

Using a weighted averaging approach, we derived an overall confidence interval in which historical project data was weighted more heavily than local experience which was weighted more heavily than public data. Decreased confidence implies that the level of available data and/or consistency is such that little confidence can be placed in the Geotechnical Considerations. Conversely, an increased confidence ranking implies that sufficient data and consistency exists to derive a high confidence in the statement of expected lithology.

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.

GEOTECHNICAL SITE RATING

The site was evaluated for the presence or potential presence of the following geotechnical challenges: Shallow Rock, Soft Soil, Expansive Soil, Variable Topography, Previous Site Usage, Seismicity, and Underlying Geologic conditions such as Karst or the presence of Loess.

Conventional construction methods likely suitable. No obvious geotechnical and/or geologic constraints.

Project contains average constructability concerns. Typical construction for this project type is expected with some contingency for variation as described within this report.

Project contains above average constructability concerns. Geotechnical and or geologic constraints likely present that warrant further studies and/or mitigation beyond what is typical.