

**Texas Commission on Environmental Quality  
Remediation Division Correspondence Identification Form**

**SITE & PROGRAM AREA IDENTIFICATION**

SITE LOCATION		REMEDIATION DIVISION PROGRAM AND FACILITY IDENTIFICATION	
Site Name: <b>Copano Enterprises LLC, dba CE Ranch LLC, Copano Site (Beds 1-4), Aransas and San Patricio County, Texas</b>		Is This Site Being Managed Under A State Lead Contract? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Address 1: <b>7037 CR 93</b>		Program Area:	<b>IHW CORRECTIVE ACTION</b>
Address 2:		Mail Code:	<b>MC-127</b>
City: <b>Aransas Pass</b>	State: <b>Texas</b>	Is This A New Site To This Program Area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Zip Code: <b>78336</b>	County: <b>Aransas</b>		
TCEQ Region: <b>Region 14 - Corpus Christi</b>		--Leave This Field Blank--	--Leave This Field Blank--

**DOCUMENT(S) IDENTIFICATION**

PHASE OF REMEDIATION	DOCUMENT NAME
1. <b>MISCELLANEOUS</b>	<b>CLASS 3 GROUNDWATER DEMONSTRATION REPORT</b>
2.	
3.	
4.	
5.	

**CONTACT INFORMATION**

**RESPONSIBLE PARTY INFORMATION**

Name: \_\_\_\_\_  
 Company: **Copano Enterprises LLC** Phone Number: **412-315-2785** Fax Number: \_\_\_\_\_  
 Address 1: **201 Isabella St.** City: **Pittsburgh** State: **PA** Zip Code: **15212-5858**  
 Address 2: \_\_\_\_\_ Email: **ronald.morosky@alcoa.com**

**ENVIRONMENTAL CONSULTANT/REPORT PREPARER/AGENT**

Name: **Matt Wickham** Phone Number: **361-573-6442** Fax Number: **361-573-6449**  
 Company: **Golder Associates Inc.** City: **Victoria** State: **TX** Zip Code: **77901**  
 Address 1: **620 E. Airline** Email: **matthew\_wickham@golder.com**  
 Address 2: \_\_\_\_\_

**TCEQ INTERNAL USE ONLY**

Document No.	TCEQ Database Term	Document No.	TCEQ Database Term
1.		4.	
2.		5.	
3.			

Copano Enterprises LLC  
201 Isabella Street  
Pittsburgh, PA 15212-5858 USA

April 24, 2020

Ms. Eleanor T. Wehner  
VCP-CA Section  
Remediation Division  
Texas Commission on Environmental Quality  
P.O Box 13087  
Austin, Texas 78711-3087

Re: Class 3 Groundwater Demonstration Report  
Copano Enterprises LLC, dba CE Ranch LLC, Copano Site (Beds 1-4)  
Aransas and San Patricio County, Texas  
9019 Settlement Agreement effective May 21, 2018  
TCEQ SWR No. 30097; EPA ID No. TXD008129983  
Customer No. CN605550557; Regulated Entity No. RN104914312

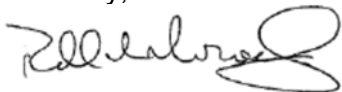
Ms. Wehner,

Please find enclosed two copies of the Class 3 Groundwater Demonstration Report prepared by Golder Associates Inc. for Copano Enterprises LLC, dba as CE Ranch LLC, Copano Site.

Unless otherwise directed and in accordance with your letter of June 10, 2019, CE Ranch LLC will submit the Affected Property Assessment Report on or before June 30, 2020 using the enclosed report as a basis to assess site groundwater.

Please contact me with any questions you may have.

Sincerely,



Ronald M. Morosky  
Operations Manager

Enc.

cc:

Abigail Ryan, TCEQ  
Susan Clewis, TCEQ  
Beth Seaton, TCEQ  
Matt Wickham, Golder



**REPORT**

# Class 3 Groundwater Demonstration

*CE Ranch, LLC - Copano Property*

Submitted to:

**Texas Commission on Environmental Quality**

12100 Park 35 Circle  
Austin, Texas 78753

Submitted by:

**Golder Associates Inc.**

620 E. Airline, Victoria, Texas, USA 77901

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4/24/2020



## Distribution List

Abigail Ryan - TCEQ

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Ron Morosky - Alcoa Corporation



## Signature Page

### Golder Associates Inc.



Caitlin Carter, GIT  
Staff Geologist



Matthew K. Wickham, P.G.  
Principal Hydrogeologist



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Figure 2-1: Geologic Cross Sections A-A'

Figure 2-2: Geologic Cross Sections B-B'

Figure 2-3: Geologic Cross Section C-C'

Figure 2-4: Potentiometric Surface Map (Zone A) – February 4, 2020

Figure 2-5: Potentiometric Surface Map (Zone B) – February 4, 2020

Figure 3-1: Water Well Location Map

Figure 4-1: Trilinear Diagram

## ATTACHMENTS

Attachment 1: Water Well Database Search (Banks)

## 1.0 INTRODUCTION AND BACKGROUND

### 1.1 Background

Copano Enterprises LLC (dba CE Ranch, LLC in Texas) (CE) owns and operates the Copano Property (the Site), in San Patricio and Aransas Counties, Texas (Figure 1-1). CE and the Texas Commission on Environmental Quality (TCEQ) entered into a 9019 Settlement Agreement (the Agreement) on May 21, 2018 that outlines environmental and other requirements, including requirements related to Site groundwater.

A Revised Preliminary Groundwater Assessment Report was prepared by Golder Associates Inc. (Golder) and submitted to the TCEQ on May 3, 2019 (Golder, 2019a). The report described the procedures/results to address the groundwater assessment requirements of the Agreement. A Revised Drinking Water Survey Report submitted to the TCEQ on May 24, 2019 (Golder, 2019b) documented that no privately-owned drinking water wells were located within 0.25-mile radius of the Site. The TCEQ approved these documents in a letter dated June 10, 2019 and requested the submission of an Affected Property Assessment Report (APAR) for the Site.

### 1.2 Objective

Groundwater resource classification is a necessary component of the APAR for Sites managed under the Texas Risk Reduction Program (TRRP). Per the guidance document “Groundwater Classification” (TCEQ Publication RG-366/TRRP-8), the results of the groundwater classification for all affected groundwater-bearing units (GWBUs) and threatened hydraulically-interconnected GBWUs shall be submitted for TCEQ review in the APAR. However, per RG-366/TRRP-8, the TCEQ encourages submittal of groundwater information used to support a Class 3 classification prior to full completion and submittal of the APAR, ensuring early TCEQ concurrence with a Class 3 groundwater classification and avoiding delays and remobilizations for additional assessments, revision of the APAR, and duplication of work. This Class 3 Groundwater Demonstration report is intended to address that objective and documents the results of the groundwater classification in the format suggested in Section 2.9 of RG-366/TRRP-8.

### 1.3 Copano Property Description

The Site is bordered to the north and east by Copano Bay and Port Bay, respectively (Figure 1-1). State Highway 136 traverses north-south through the center of the property. From 1972 until 2016, bauxite residue was pumped to the Site via pipelines from an alumina refinery located approximately 10 miles to the south on Corpus Christi Bay.

The Copano Property consists of more than 11,000 acres. There are four separate surface impoundments (designated Beds 1, 2, 3 and 4) at the Site, covering approximately 3,100 acres (Figure 1-2). The dikes of the impoundments were reportedly constructed of native clays sourced from shallow excavations on the property, and keyed into the underlying approximate 20-ft thick surficial clay layer.

The groundwater monitoring network at the Site currently consists of 34 permanent monitoring wells. Twenty-five of the wells were installed prior to 2018 and are completed in the uppermost water-bearing unit (Zone A). Nine additional wells (MW-3RB, MW-5B, MW-6RB, MW-7B, MW-11B, MW3-4B, MW3-7B, MW4-3B, and MW4-7B) were installed in 2018 and are completed in Zone B (Figure 1-2, Table 1-1).

### 1.4 Environmental Setting

The topography of the area is relatively flat. The land surface elevation, prior to construction of the impoundments, ranged from 6.9 feet (ft) MSL near Port Bay to 14 ft MSL on the western limit of the property. Drainage is generally to the east towards Port Bay. The approximate elevations of the top of the bed dikes are as follows:

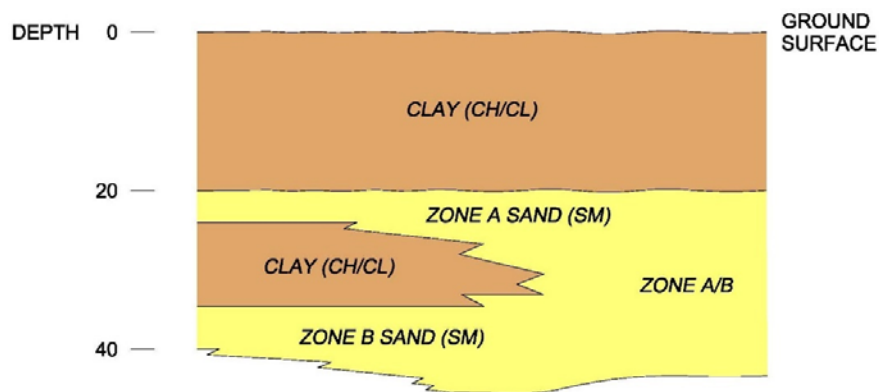
- Bed 1 - 29.5 ft MSL
- Bed 2 – 30 ft MSL
- Bed 3 - 32 ft MSL
- Bed 4 – original elevation at 39 ft MSL; dike repair that began in 2019 has lowered this height to 36 ft MSL

Given the proximity to the estuaries of Port Bay and Copano Bay, some marsh lands exist on the Site. In addition, several small lakes are present, some formed through excavation of clay material from on-Site borrow areas for dike construction.

## 2.0 IDENTIFICATION OF GROUNDWATER-BEARING UNITS

Investigations at the facility have provided information about the Site subsurface geology and hydrogeology. In general, subsurface strata are part of the Quaternary (Pleistocene) Beaumont Formation, which consists of mostly clay, silt, sand and gravel deposited in stream channel, point bar, natural levee, and backswamp depositional environments. Subsurface complexity arises due to the interbedded nature of these deposits and reflects the various depositional environments of the Beaumont Formation. Multiple sand units are present in the subsurface that are typically separated by clays (i.e., confining units).

The surface soil observed at the Site is a medium to high plasticity clay that extends to a depth of approximately 20 feet below the ground surface (bgs). Beneath this surface clay is the uppermost GWBU (Zone A) that varies in composition from a silty to clayey sand, ranges in thickness from just a few feet to over 20 feet, and typically contains interbedded clay and silty clay. A deeper GWBU (Zone B) is present beneath Zone A and a clay confining unit (ranging from a few feet to over 10 feet thick). Zone B, typically represented by silty sand and less frequently as a clayey sand, also varies in thickness from a few feet to over 20 feet. Occasionally, the clay unit between Zones A and B is absent resulting in a thick sequence of sand with interbedded clay and silty clay and represented as Zone A/B. The subsurface stratigraphy is shown on the generalized section below.



Geologic cross-sections were prepared using available stratigraphic data (Figures 2-1, 2-2 and 2-3) and show the multiple interbedded sand and clay units described above.

Groundwater in Zones A and B occur under confined conditions, i.e., the water level in a well is at a higher elevation than the top of the water bearing unit at that well location. Lateral groundwater flow in the upper water-bearing units ranges from toward the northeast to southeast towards Copano Bay and Port Bay. Potentiometric surface maps for Zones A and B prepared from water-level gauging data collected on February 4, 2020 are provided as Figures 2-4 and 2-5, respectively.

Zones A and B are generally separated by a significantly thick clay layer and in these instances are not likely to be hydraulically interconnected. However, as noted above, occasionally the clay layer is not present and the zones are hydraulically interconnected as Zone A/B.

Hydraulic slug tests were conducted on four wells (two in Zone A, two in Zone B) to estimate the hydraulic conductivity of the GWBUs. For Zone A, the estimated hydraulic conductivity ranged from  $7.0 \times 10^{-4}$  centimeters per second (cm/s) to  $1.6 \times 10^{-3}$  cm/s. For Zone B, the estimated hydraulic conductivity ranged from  $1.2 \times 10^{-4}$  cm/s to  $3.9 \times 10^{-4}$  cm/s.

The potential for groundwater discharge to adjacent surface water bodies was considered using the stratigraphic and hydrogeologic data. Where data were available, the relationships between the uppermost GWBUs and adjacent surface water bodies (Port Bay, Swan Lake, Freshwater Lake) were added to the Site cross sections (Figures 2-1, 2-2 and 2-3). As shown on the cross sections, the uppermost GWBU does not intersect the surface water bodies. Rather, there is typically a minimum of approximately 4 to 5 feet of clay between the bottom of the surface water body and the top of the GWBU, and often as much as 7 to 8 feet of clay.

### 3.0 CURRENT USE AND GENERAL HYDROGEOLOGIC CONTEXT

Water well records obtained through the Texas Water Development Board (TWDB) and Banks Environmental Data, Inc. (Banks) were reviewed to identify the potential location of water wells within a 0.5-mile radius of the perimeter of Beds 1-4 and the Decant Pond. Well location and designated use information obtained from the TWDB and Banks was reviewed and verified by Golder personnel in the field to the extent possible. Many of the wells identified in the Banks report (Attachment 1) are either incorrectly mapped in the database with actual locations greater than 0.5 miles from the affected property or were not observed on the ground at the reported location (presumably abandoned, destroyed, plugged, etc.). A summary of Golder's review of the Banks records and other information is provided in Table 3-1. A map of water well locations is provided as Figure 3-1.

Three water wells were identified within a 0.5-mile radius of the affected property. These wells (State ID 79-63-802, 79-63-801 and 136832) are registered to Copano Enterprises LLC and are located on the Copano Property (i.e., on the 11,000-acre ranch property). These wells are not used for potable purposes.

No water wells were identified within 0.5-mile radius of the affected property that supply groundwater for human consumption, agricultural purposes or any purpose which could result in exposure to human or ecological receptors.

## 4.0 NATURAL WATER QUALITY

Five groundwater sampling events from all 34 monitoring wells have been performed at the Site. Total dissolved solids (TDS) analysis was performed during each event and exceeded 10,000 mg/L for each sample (Table 4-1) with one exception (from well MW-1, 8,280 mg/L, sample collected 9/20/2018). Concentrations of TDS in samples collected from Zones A and B monitoring wells averaged 34,204 and 40,218 mg/L, respectively. In addition, groundwater quality at well locations farthest upgradient in Zones A and B (see Figures 2-4 and 2-5, respectively) were further assessed with regard to background conditions. The arithmetic mean of the TDS data reported for MW-9 (Zone A) for the five sampling events is 18,960 mg/L and the arithmetic mean of the TDS data reported for MW-5B (Zone B) for the five sampling events is 23,180 mg/L. These data exceed 10,000 mg/L and meet the naturally-occurring criteria for a Class 3 groundwater resource.

The natural salinity in Zone A/B groundwater is due to several potential factors:

- Presence of intruded seawater or connate sea/bay water deposited with the native sediments;
- Historical infiltration of wind-driven sea/bay water aerosols;
- Historical inundation by sea/bay water; and/or
- Concentrating effects of evapotranspiration.

The cation and anion data for the monitoring well samples were plotted on a trilinear (piper) diagram (Figure 4-1). Review of this figure indicates that the geochemical signature of Site groundwater is very similar across all samples/wells given the close grouping of the data on the diagram. This indicates that there is no variability of the source of the natural salinity for all the groundwater samples collected from the wells at the Site.



## 5.0 GROUNDWATER RESOURCE CLASSIFICATION

RG-366/TRRP-8 states that a Class 3 groundwater resource designation is applied for GWBUs where: i) the natural TDS concentration exceeds 10,000 mg/L, and where: (ii) there is no human or ecological exposure to groundwater from that GWBU within 0.5-miles. Results of the groundwater resource classification evaluation for the Site as detailed in the previous sections of this report indicate that the uppermost GWBUs at the Site (Zones A and B) meet the criteria for a Class 3 groundwater resource, as defined by TRRP Rule §350.52(3) and consistent with RG-366/TRRP-8, for inclusion in the APAR.

## 6.0 REFERENCES

Golder Associates Inc., 2019a. *Revised Preliminary Groundwater Assessment Report*. Report Submitted to Texas Commission on Environmental Quality. May 3.

Golder Associates Inc., 2019b. *Revised Drinking Water Survey Report*. Report Submitted to Texas Commission on Environmental Quality. May 24.

## TABLES

**TABLE 1-1  
MONITORING WELL CONSTRUCTION SUMMARY  
CE RANCH LLC  
COPANO PROPERTY**

MONITORING WELL ID	DATE INSTALLED	EASTING <sup>1</sup> (SURVEY FT.)	NORTHING (SURVEY FT.)	TOP OF CASING ELEVATION <sup>2</sup> (FT. MSL <sup>3</sup> )	GROUND SURFACE ELEVATION (FT. MSL)	CASING STICKUP (FT.)	TOTAL DEPTH (FT. TOC) <sup>4</sup>		BOTTOM OF WELL ELEVATION (FT. MSL)	WELL DIAMETER (IN.) <sup>7</sup>	SCREENED INTERVAL (FT. TOC)		SCREENED INTERVAL (FT. MSL)	
							Constructed <sup>5</sup>	Measured <sup>6</sup>			TOP OF SCREEN	BOTTOM OF SCREEN	TOP OF SCREEN	BOTTOM OF SCREEN
<b>Beds 1 &amp; 2</b>														
MW-1	3/4/1968	2554890.41	13181961.05	9.7	6.5	3.2	18.0	20.48	-14.0	4	12.5	17.5	-2.8	-7.8
MW-3R	12/28/1995	2556203.85	13185739.88	8.3	5.5	2.8	22.7	22.98	-17.5	4	17.3	22.3	-9.0	-14.0
MW-3RB	8/23/2018	2556210.16	13185763.11	8.9	5.9	3.0	50.0	50.04	-44.1	2	35.0	50.0	-26.1	-41.1
MW-4	5/1/1968	2548195.36	13193519.80	10.6	7.0	3.6	21.6	21.21	-14.2	3	18.6	21.1	-8.0	-10.5
MW-5	6/11/1968	2545788.53	13189528.32	16.1	12.3	3.8	22.1	21.78	-9.5	3	16.6	21.6	-0.5	-5.5
MW-5B	8/21/2018	2545796.93	13189519.05	15.5	12.7	2.8	51.8	51.40	-38.7	2	31.8	51.8	-16.3	-36.3
MW-6R	12/28/1995	2543049.31	13184463.93	17.3	14.6	2.7	21.1	20.21	-5.6	4	14.7	19.7	2.6	-2.4
MW-6RB	8/22/2018	2543052.74	13184442.10	16.5	13.9	2.6	48.9	50.20	-36.3	2	38.9	48.9	-22.4	-32.4
MW-7	5/1/1968	2551903.72	13181196.10	10.7	7.0	3.7	20.1	22.62	-15.6	4	17.1	19.6	-6.4	-8.9
MW-7B	8/23/2018	2551964.82	13181224.53	11.2	8.5	2.7	53.7	52.53	-44.0	2	38.7	53.7	-27.5	-42.5
MW-8	12/27/1995	2544114.89	13186418.36	14.8	13.6	1.2	19.0	18.49	-4.9	4	13.0	18.0	1.8	-3.2
MW-9	12/28/1995	2543622.06	13185500.79	17.2	15.5	1.7	19.0	18.94	-3.4	4	13.5	18.5	3.7	-1.3
MW-10	12/28/1995	2544578.75	13182809.66	16.8	15.2	1.6	18.9	18.99	-3.8	4	13.4	18.4	3.4	-1.6
MW-11	12/28/1995	2545895.66	13182809.66	15.4	13.7	1.7	19.6	19.02	-5.3	4	14.1	19.1	1.3	-3.7
MW-11B	8/23/2018	2545923.33	13182806.40	16.8	14.3	2.5	35.6	36.45	-22.2	2	30.6	35.6	-13.8	-18.8
DB-5	9/8/1995	2554890.41	13184250.91	30.2	24.6	5.6	51.5	44.00	-19.4	4	40.2	50.2	-10.0	-20.0
TPZ-1	6/27/2018	2547145.12	13182089.88	13.2	11.7	1.5	15.0	13.40	-1.7	1	8.5	13.5	4.7	-0.3
TPZ-1A	6/27/2018	2547148.47	13182087.76	13.7	11.6	2.1	36.0	34.30	-22.7	1	25.1	35.1	-11.4	-21.4
TPZ-2	6/28/2018	2546367.71	13190515.22	14.9	12.8	2.1	18.0	16.96	-4.2	1	12.1	17.1	2.8	-2.2
TPZ-2A	3/28/2018	2546369.98	13190518.58	15.0	12.8	2.2	38.0	37.05	-24.3	1	32.2	37.2	-17.2	-22.2
<b>Bed 3</b>														
MW3-1	5/23/1973	2556791.06	13190073.26	10.9	6.7	4.2	18.6	18.55	-11.9	4	15.6	18.1	-4.7	-7.2
MW3-2	5/23/1973	2558551.98	13189110.14	11.5	7.4	4.1	19.9	19.91	-12.5	4	16.9	19.4	-5.4	-7.9
MW3-3	3/13/1977	2559629.93	13189635.99	10.7	6.5	4.2	20.2	20.30	-13.8	4	17.2	19.7	-6.5	-9.0
MW3-4	3/12/1977	2561026.53	13190786.89	8.1	3.8	4.3	15.8	15.86	-12.1	4	12.8	15.3	-4.7	-7.2
MW3-4B	8/21/2018	2561011.16	13190806.63	7.5	5.0	2.5	45.0	44.58	-39.6	2	30.0	45.0	-22.5	-37.5
MW3-5	3/12/1977	2562709.19	13191890.45	9.0	5.6	3.4	16.8	16.69	-11.1	4	14.0	16.5	-5.0	-7.5
MW3-6	3/12/1977	2562271.32	13192685.91	9.6	5.8	3.8	17.0	16.92	-11.1	4	14.0	16.5	-4.4	-6.9
MW3-7	3/12/1977	2560250.21	13194358.87	10.8	6.6	4.2	20.7	20.63	-14.0	4	17.7	20.2	-6.9	-9.4
MW3-7B	8/20/2018	2560151.55	13194427.80	10.2	7.0	3.2	53.2	51.91	-44.9	2	33.2	53.2	-23.0	-43.0
TPZ-5	6/29/2018	2557583.23	13189707.28	10.6	9.1	1.5	28.0	26.30	-17.2	1	16.5	26.5	-5.9	-15.9
TPZ-5A	6/29/2018	2557584.31	13189710.67	10.9	9.2	1.7	53.0	51.40	-42.2	1	36.7	51.7	-25.8	-40.8
<b>Bed 4</b>														
MW4-1	04/1979	2550305.96	13194698.91	10.0	6.4	3.6	13.2	13.32	-6.9	2	10.2	12.7	-0.2	-2.7
MW4-2	04/1979	2551715.01	13195698.16	9.5	5.3	4.2	17.5	17.56	-12.3	3	12.9	17.9	-3.4	-8.4
MW4-2A	Unknown	2551095.28	13195233.05	9.7	6.1	3.6	17.1	17.09	-11.0	2	6.9	16.7	2.8	-7.0
MW4-3	04/1979	2553472.32	13196951.54	11.1	7.3	3.8	16.0	16.11	-8.8	3	12.0	16.0	-0.9	-4.9
MW4-3B	8/21/2018	2553473.34	13196963.42	9.6	7.3	2.3	30.3	31.05	-23.8	2	20.3	30.3	-10.7	-20.7
MW4-4	04/1979	2553551.92	13198084.87	11.1	7.9	3.2	17.2	17.19	-9.3	3	12.0	17.0	-0.9	-5.9
MW4-7	04/1979	2556522.38	13198160.61	11.5	8.6	2.9	18.0	19.69	-11.1	3	16.5	19.0	-5.0	-7.5
MW4-7A	Unknown	2557665.86	13195897.28	8.6	5.4	3.2	14.8	16.06	-10.7	3	9.5	14.5	-0.9	-5.9
MW4-7B	8/21/2018	2557661.97	13195910.51	7.9	5.4	2.5	53.5	50.85	-45.5	2	35.5	50.5	-27.6	-42.6
TPZ-3	6/28/2018	2554248.31	13191544.21	9.8	7.7	2.1	18.0	16.24	-8.5	1	12.1	17.1	-2.3	-7.3
TPZ-3A	6/28/2018	2554251.78	13191542.19	9.4	7.9	1.5	35.0	26.21	-18.3	1	18.5	33.5	-9.1	-24.1
TPZ-4A	6/29/2018	2556877.69	13194169.60	8.6	6.8	1.8	38.0	35.58	-28.8	1	16.8	36.8	-8.2	-28.2

Notes:

- 1) State Plane Coordinates, NAD 83, Texas South Zone (unless otherwise noted)
- 2) NAVD 88 Datum (unless otherwise noted)
- 3) ft MSL - feet Mean Sea Level
- 4) ft. TOC - feet below top of casing
- 5) As constructed data taken from available boring logs or GHD, 2017
- 6) in. - inches
- 7) Total depths were measured by Golder on 4/18/2018 and 10/29/18.
- 8) Data for wells completed prior to 2018 was collected from various sources and cannot be verified.

**TABLE 3-1  
WATER WELL INFORMATION  
COPANO ENTERPRISES LLC (CE RANCH LLC)**

Figure 2 ID No.	Banks ID No. <sup>1</sup>	State Well ID No.	Distance to Known Extent of Groundwater Contaminant <sup>1</sup> (ft)	Groundwater Conservation District	Well Location		Location Method <sup>2</sup>	Horizontal Datum <sup>4</sup>	Horizontal Accuracy <sup>5</sup>	Horizontal Reference <sup>6</sup>	Date Well Installed	Well Type <sup>7</sup>	Well Status <sup>8</sup>	Well Use <sup>9</sup>	Well Depth (ft BGS) <sup>10</sup>	Aquifer Code Name	Aquifer Method <sup>11</sup>	Screened Interval (or Gravel Packed) (ft BGS)	Cemented Interval (ft BGS)	Well Owner Physical/Mailing Address/ Contact Information <sup>12</sup>	Well Users Address/ Contact Information <sup>12</sup>
					Address	Latitude, Longitude															
-	1	79-63-8	NA- Plotted Incorrectly	None <sup>13</sup>	Unknown. Greater than 0.5-miles from site. Copano Retreat Rd. Bayside, TX.	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	11/5/1997	U	U	Unknown	338	112GLFC	X	298 - 338	0-10	A.P. Mariculture Mailing: P.O. Box 2259 Rockport, TX 78381	A.P. Mariculture Mailing: P.O. Box 2259 Rockport, TX 78381
2	2	79-63-802	475	None	No physical address. Aransas County, Texas	28.02465°, -97.18696°	GPS-PP <sub>4</sub>	84	P	WH	1967±	S	O	Non-Drinking Water	190	112GLFC	D	No data on state well report	No data on state well report	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
-	3	79-63-803	NA - Well not present at plotted location	Unknown - Well not present at plotted location	Aransas County, TX	Unknown - Well not present at plotted location	NA	NA	NA	NA	1938±	U	U	Unknown	190	112GLFC	D	No data on state well report	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	4	83-07-102	NA - Well not present at plotted location	Unknown - Well not present at plotted location	San Patricio County, TX	Unknown - Well not present at plotted location	NA	NA	NA	NA	1965±	U	U	Unknown	190	112GLFC	X	No data on state well report	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	5	161837	Plotted Incorrectly. Approximately >11,000 ft from Site.	None	221 King Rd. Rockport, TX 78382	27.98787°, -97.1385°	AddMat	84	U	DR	2/13/2005	U	U	Unknown	150	112GLFC	X	90-150	0-90	Max Kluge Physical: 221 King Road Rockport, TX 78382	Max Kluge Physical: 221 King Road Rockport, TX 78382
-	6	66549	Plotted Incorrectly. Approximately >30,000 ft from Site.	None	2nd St. and S. Verne off I-35 Rockport, TX	28.00996°, -97.06734°	AddMat	84	U	Notes <sup>14</sup>	2/19/2004	U	U	Unknown	185	112GLFC	X	165-185	0-100	Vic & Linda Ostrum Physical: 8109 Hwy 77 Sinton, TX 78387	Vic & Linda Ostrum Physical: 8109 Hwy 77 Sinton, TX 78387
-	7	143052	NA- Plotted Incorrectly	Unknown - Well not present at plotted location	Unknown. Greater than 0.5-miles from site. CR 2047 Odem, TX 78370	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	8/16/2004	U	U	Unknown	233	112GLFC	X	193-233	0-10	Xeric Oil & Gas Corp. Mailing: P.O. Box 352 Midland, TX 79702	Xeric Oil & Gas Corp. Mailing: P.O. Box 352 Midland, TX 79702
-	8	79-63-8	NA - Well not present at plotted location	Unknown - Well not present at plotted location	14-miles NW of Rockport, TX. Aransas County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	4/18/1984	U	U	Unknown	278	112GLFC	X	258-278	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	9	79-63-8B	NA - Well not present at plotted location	Unknown - Well not present at plotted location	14-miles NW of Rockport, TX. Aransas County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	4/14/1984	U	U	Unknown	280	112GLFC	X	240-280	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	10	160290	NA - Plotted Incorrectly	None	Unknown. Greater than 0.5-miles from site. Aransas Pass, TX	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	4/26/2005	U	U	Unknown	385	112GLFC	X	365-385	0-100	Owen Stowe Mailing: P.O. Box 1719 Rockport, TX 78381	Owen Stowe Mailing: P.O. Box 1719 Rockport, TX 78381
-	10	159947	NA - Plotted Incorrectly	None	Unknown. Greater than 0.5-miles from site. 3 miles from Hwy 181 on Copano Retreat Rd. <sup>15</sup> Rockport, TX	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	5/16/2005	U	U	Unknown	320	112GLFC	X	290-320	0-100	John Hurt Physical: 4122 Russell Corpus Christi, TX 78408	John Hurt Physical: 4122 Russell Corpus Christi, TX 78408
-	11	79-63-8B	NA - Well not present at plotted location	Unknown - Well not present at plotted location	14-miles NW of Rockport, TX. Aransas County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	4/20/1984	U	U	Unknown	282	112GLFC	X	262-282	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	12	79-63-8B	NA - Well not present at plotted location	Unknown - Well not present at plotted location	14-miles NW of Rockport, TX. Aransas County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	4/19/1984	U	U	Unknown	275	112GLFC	X	255-275	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	13	160284	NA - Plotted Incorrectly	None	Unknown. Greater than 0.5-miles from site. 2.6 miles N of Hwy 181 on Copano Retreat Rd. <sup>15</sup> Rockport, TX	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	5/2/2005	U	U	Unknown	400	112GLFC	X	370-400	0-100	Owen Stowe Mailing: P.O. Box 1719 Rockport, TX 78381	Owen Stowe Mailing: P.O. Box 1719 Rockport, TX 78381
-	14	428609	Plotted Incorrectly. Approximately >25,000 ft from Site.	None	1731 Ruby Allen St. Rockport, TX	28.00337°, -97.07836°	AddMat	84	U	SC	6/14/2016	U	U	Unknown	160	112GLFC	X	100-160	0-96	Bobby Tedder Physical: 1731 Ruby Allen St. Rockport, TX 78382	Bobby Tedder Physical: 1731 Ruby Allen St. Rockport, TX 78382
-	15	83-07-1	NA - Well not present at plotted location	Unknown - Well not present at plotted location	CR 93 Gregory, TX 78359	Unknown - Well not present at plotted location	NA	NA	NA	NA	3/7/2002	U	U	Unknown	243	112GLFC	X	203-243	0-10	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	16	168554	Plotted Incorrectly. Approximately >50,000 ft from Site.	San Patricio GCD	220 Woodhaven Ingleside on the Bay, TX	27.83543°, -97.21926°	AddMat	84	U	SC	2/16/2009	U	U	Unknown	91	112GLFC	X	81-91	0-81	Oscar Osorto Physical: 220 Woodhaven Ingleside on the Bay, TX	Oscar Osorto Physical: 220 Woodhaven Ingleside on the Bay, TX
18	17	79-63-801	2604	None	No physical address. Aransas County, TX	28.02439°, -97.16743°	GPS-PP <sub>4</sub>	84	P	WH	1955±	S	O	Non-Drinking Water	199	112BMNT	D	187-199	No data on state well report	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
-	18	79-63-9F	NA - Well not present at plotted location	Unknown - Well not present at plotted location	3.0-miles S from Rockport, TX. Aransas County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	11/29/1984	U	U	Unknown	200	112GLFC	X	160-200	0-15	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	19	83-07-1	NA - Well not present at plotted location	Unknown - Well not present at plotted location	San Patricio County, TX	Unknown - Well not present at plotted location	NA	NA	NA	NA	11/29/1999	U	U	Unknown	159	112GLFC	X	139-159	0-10	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	20	441047	Plotted Incorrectly. Approximately >23,000 ft from Site.	None	1502 W. 12th St. Rockport, TX 78382	28.00188°, -97.08788°	AddMat	84	U	DR	1/11/2017	U	U	Unknown	167	112GLFC	X	147-167	0-100	Wells Collection McLean Residence Physical: 1502 W 12th St. Rockport, TX 78382	Wells Collection McLean Residence Physical: 1502 W 12th St. Rockport, TX 78382
-	21	83-07-1B	NA - Well not present at plotted location	Unknown - Well not present at plotted location	7.0-miles NE from Gregory, TX. San Patricio County.	Unknown - Well not present at plotted location	NA	NA	NA	NA	No data on state well report	U	U	Unknown	215	112GLFC	X	195-215	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
23	22	136832	2213	None	No physical address. Aransas County, TX	28.01929°, -97.20719°	GPS-PP <sub>4</sub>	84	P	WH	8/2/2007	S	C	Non-Drinking Water	300	112GLFC	X	260-300	0-10	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785

**TABLE 3-1  
WATER WELL INFORMATION  
COPANO ENTERPRISES LLC (CE RANCH LLC)**

Figure 2 ID No.	Banks ID No. <sup>1</sup>	State Well ID No.	Distance to Known Extent of Groundwater Contamination <sup>2</sup> (ft)	Groundwater Conservation District	Well Location		Location Method <sup>3</sup>	Horizontal Datum <sup>4</sup>	Horizontal Accuracy <sup>5</sup>	Horizontal Reference <sup>6</sup>	Date Well Installed	Well Type <sup>7</sup>	Well Status <sup>8</sup>	Well Use <sup>9</sup>	Well Depth (ft BGS) <sup>10</sup>	Aquifer Code Name	Aquifer Method <sup>11</sup>	Screened Interval (or Gravel Packed) (ft BGS)	Cemented Interval (ft BGS)	Well Owner Physical/Mailing Address/ Contact Information <sup>12</sup>	Well Users Address/ Contact Information <sup>12</sup>
					Address	Latitude, Longitude															
-	22	136831	NA - Well not present at plotted location	Unknown - Well not present at plotted location	Rockport, TX	Unknown - Well not present at plotted location	NA	NA	NA	NA	7/30/2007	U	U	Unknown	326	112GLFC	X	280-320	0-10	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	23	42379	NA - Plotted Incorrectly	San Patricio GCD	Unknown. Greater than 0.5-miles from site. CR 93 8/10-miles from Hwy 136 Portland, TX 78374	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	6/20/2003	U	U	Unknown	247	112GLFC	X	207-247	0-100	Abel Adame Physical: 208 Wilshire Portland, TX 78374	Abel Adame Physical: 208 Wilshire Portland, TX 78374
-	24	83-07-104	NA - Well not present at plotted location	Unknown - Well not present at plotted location	San Patricio County, TX	Unknown - Well not present at plotted location	NA	NA	NA	NA	1965±	U	U	Unknown	280	112GLFC	D	No data on state well report	No data on state well report	Unknown - Well not present at plotted location	Unknown - Well not present at plotted location
-	25	79-63-7	NA - Plotted Incorrectly	San Patricio GCD	Unknown. Greater than 0.5-miles from site. Leo Miller Rd. 188 Rd. and 136 Rd. Bayside, TX. San Patricio County.	Unknown. Coordinates incorrect in Banks report.	NA	NA	NA	NA	5/4/1998	U	U	Unknown	250	112GLFC	X	228-248	0-100	David Martinez Physical: 2553 Dan Forth Ingleside, TX 78362	David Martinez Physical: 2553 Dan Forth Ingleside, TX 78362
28	-	-	2945	None	111 Miller Rd. Taft, TX 78390	28.01871°, -97.21111°	GPS-PP <sub>4</sub>	84	P	WH	U <sup>16</sup>	Prv*	O	Non-Drinking Water	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
29	-	-	2760	None	141 Miller Rd. Taft, TX 78390	28.01727°, -97.21139°	Map	84	U	NE-CL	U <sup>16</sup>	Prv	U	Drinking Water <sup>17</sup>	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Marta Velasquez Mailing/Physical: 141 Leo Miller Rd. Taft, TX 78390	Marta Velasquez Mailing/Physical: 141 Leo Miller Rd. Taft, TX 78390
30	-	-	3127	None	161 Miller Rd. Taft, TX 78390	28.01590°, -97.21303°	GPS-PP <sub>4</sub>	84	P	WH	U <sup>16</sup>	Prv*	O	Non-Drinking Water	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
31	-	-	3322	None	221 Miller Rd. Taft, TX 78390	28.01355°, -97.21399°	GPS-PP <sub>4</sub>	84	P	WH	U <sup>16</sup>	Prv*	O	Non-Drinking Water	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
32	-	485920	3383	San Patricio GCD	261 Leo Miller Rd. Taft, TX 78390	28.01188°, -97.21500°	Map	84	Q	E-CL	4/24/2018	Prv-	O	Non-Drinking Water	310	112GLFC	X	270-310	0-100	Isidro and Yvonne Arismendez Mailing/Physical: 261 Leo Miller Rd. Taft, TX 78390 Phone: (512) 658-0643	Isidro and Yvonne Arismendez Mailing/Physical: 261 Leo Miller Rd. Taft, TX 78390 Phone: (512) 658-0643
33	-	-	3616	San Patricio GCD	8153 CR 4351 Portland, TX 78374	28.01148°, -97.2158°	GPS-PP <sub>4</sub>	84	P	WH	U <sup>16</sup>	Prv*	O	Non-Drinking Water	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785
34	-	249208	3038	San Patricio GCD	8115 CR 4351 Taft, TX 78390	28.01015°, -97.21667°	Map	84	Q	S-CL	3/23/2011	Prv-	O	Non-Drinking Water	320	112GLFC	X	280-320	0-100	Charles McCarley Mailing/Physical: 8115 CR 4351 Taft, TX 78390	Randy Stasney Mailing/Physical: 8115 CR 4351 Taft, TX 78390
35	-	-	2910	San Patricio GCD	8097 CR 4351 Taft, TX 78390	28.00930°, -97.21722°	Map	84	P	S-CL	U <sup>16</sup>	Prv*	O	Non-Drinking Water	U <sup>16</sup>	112GLFC	X	U <sup>16</sup>	U <sup>16</sup>	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785	Copano Enterprises LLC Physical: 7037 CR 93 Aransas Pass, TX 78336 Mailing: 201 Isabella St. Pittsburgh, PA 15212 Ronald Morosky (412)-315-2785

Notes:  
1) See map in Banks Report, Attachment 3  
2) Distance to nearest monitoring well where a sample exceeded a PCL for a COPC.  
3) Location Method:  
GPS-PP<sub>4</sub> - GPS coordinates, Pathfinder Office P.P.  
AddMat - Address Matching  
Map - Map Interpolation, Digital  
NA - Coordinates were not able to be obtained  
4) Horizontal Datum:  
NA - Coordinates were not able to be obtained  
84 - World Geodetic System 1984 (WGS 84)  
5) Horizontal Accuracy:  
P - Less than 2 meters  
Q - Within 2 to 5 meters  
U - Unknown  
NA - Coordinates were not able to be obtained  
6) Horizontal Reference:  
WH - Wellhead  
DR - Private driveway at the road  
SC - Site center  
NE-CL - Northeast corner of land parcel  
E-CL - East corner of land parcel  
S-CL - South corner of land parcel  
NA - Coordinates were not able to be obtained  
Notes - See additional comments regarding why the location was taken at a particular spot

7) Well Type:  
Prv - Private. Well meets definition of private drinking water well in Texas Water Code, Section 26.408, and guidance document RG-428.  
S - Stock  
U - Unknown  
Prv- - No appropriate well type available. Well is on private property and is not used for drinking water.  
Prv\* - No appropriate well type available. Well is on private property owned by Copano Enterprises LLC and is not in use.  
8) Well Status:  
O - Well is operational  
C - Well is capped according to TDLR Rules  
U - Well status is unknown  
9) Well Use:  
Non-Drinking Water  
Drinking Water  
Note: Copano Enterprises LLC has confirmed the wells on their property are not used for drinking water.  
10) ft BGS - feet below ground surface  
11) Aquifer Method:  
X - Aquifer Code assumed from geographic location  
D - Interpretation of Driller's Log  
12) Address/contact information of well owner(s) and/or user(s) has been updated to reflect current property owner(s) information, as possible. Shaded cells indicate address/contact information of well owner(s) and/or user(s) was provided by the Banks well reports and is unable to be verified.  
13) The Aransas County Groundwater Conservation District (ACGCD) was created by the 84th Texas Legislature and was running as a temporary organization in 2015. In 2016, county voters rejected the creation of a permanent Groundwater Conservation District. Therefore, ACGCD is non-existent.  
14) Coordinates represent the intersection of 2nd St. and S. Verne St. in Rockport, TX.  
15) Hwy 181 does not exist. Copano Retreat Rd. is off of Hwy 188 and is 2.65-miles long.  
16) No state well record available. Owner not able to provide information.  
17) Owners of the well were not able to be contacted. Could not confirm whether well was used for drinking water.  
18) Shaded cells indicate the information was provided by the associated well report and is unable to be verified.





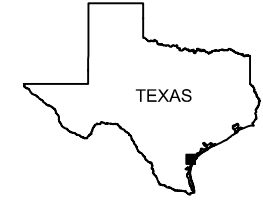
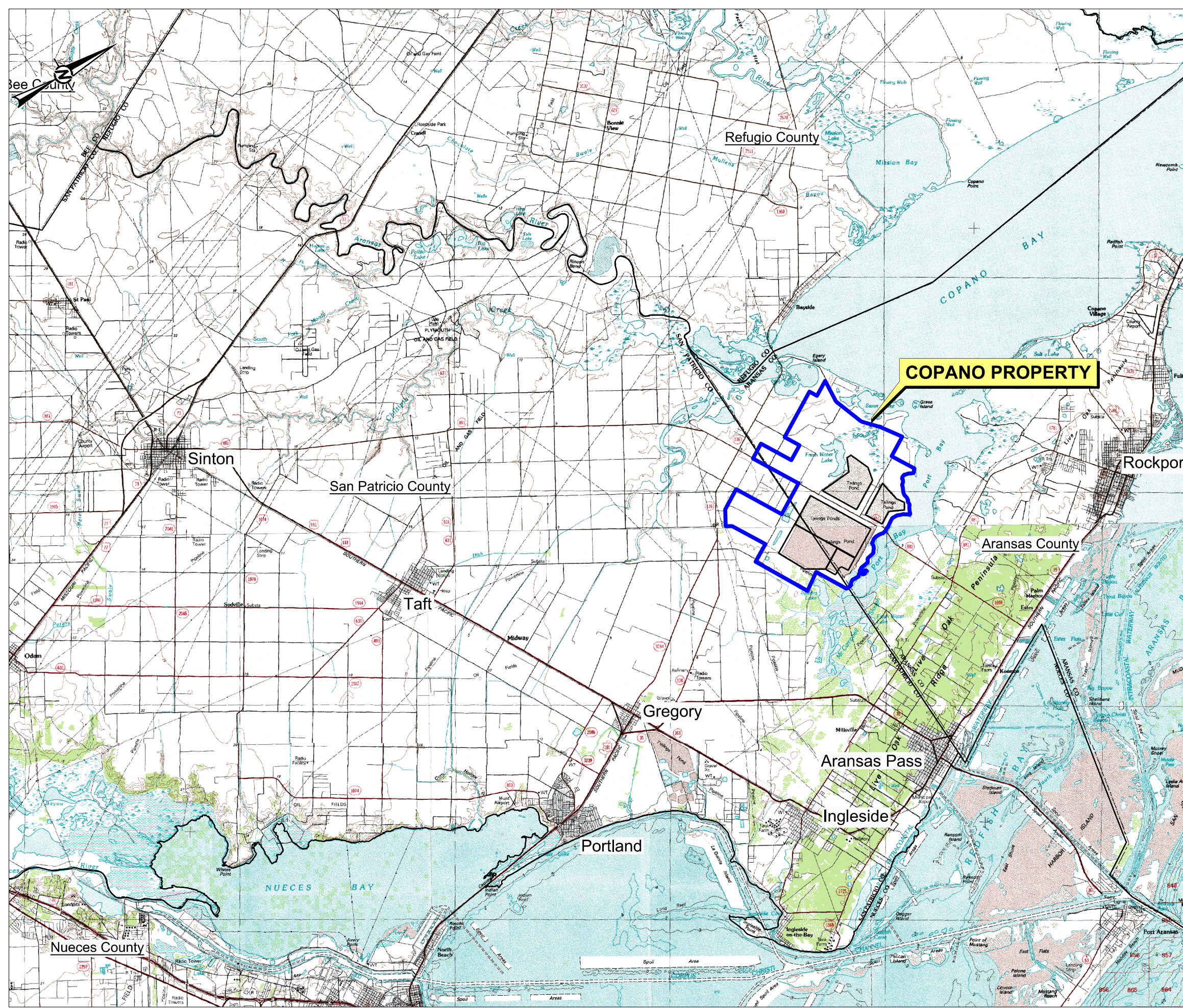






## FIGURES





QUADRANGLE LOCATIONS

REFERENCE(S)  
 BASE MAP FROM WWW.TNRIS.GOV, BEEVILLE, TEX 30X60 MIN. USGS QUADRANGLE DATED 1985 AND CORPUS CHRISTI, TX 30X60 MIN. USGS QUADRANGLE DATED 1984.



CLIENT  
 CE RANCH LLC

PROJECT  
 COPANO PROPERTY

TITLE  
 REGIONAL LOCATION MAP

CONSULTANT	YYYY-MM-DD	2018-11-01
	DESIGNED	BZH
	PREPARED	BZH
	REVIEWED	SNR
	APPROVED	SNR

PROJECT NO.  
 18105404

REV.  
 0

FIGURE  
 1-1



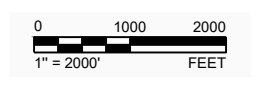
Path: \\uswestnrc.golder.com\golder\Projects - Victoria\_2010\18105404\Copano\2020-01-Jan-11-File Name: FIG 1-3 Site Location Map.dwg | Last Edited By: pmb@bde | Date: 2020-01-07 Time: 3:13:59 PM | Printed By: pmb@bde | Date: 2020-01-17 Time: 9:46:20 AM



**LEGEND**

	APPROXIMATE PROPERTY BOUNDARY
	MW4-1 MONITORING WELL LOCATION (FUGRO) (ZONE A)
	TPZ-2 TEMPORARY PIEZOMETER(S) LOCATION (ZONE A)
	B-7 BORING LOCATION (ZONE A)
	MW3-7B MONITORING WELL LOCATION (ZONE B)
	TPZ-2A TEMPORARY PIEZOMETER(S) LOCATION (ZONE B)

**REFERENCE(S)**  
 MAP BASED ON AERIAL PHOTOMETRIC MAP BY LANMON AERIAL PHOTOGRAPHY, FLOWN OCTOBER 23, 2019.



CLIENT  
 CE RANCH LLC

PROJECT  
 COPANO PROPERTY

TITLE  
 SITE LOCATION MAP

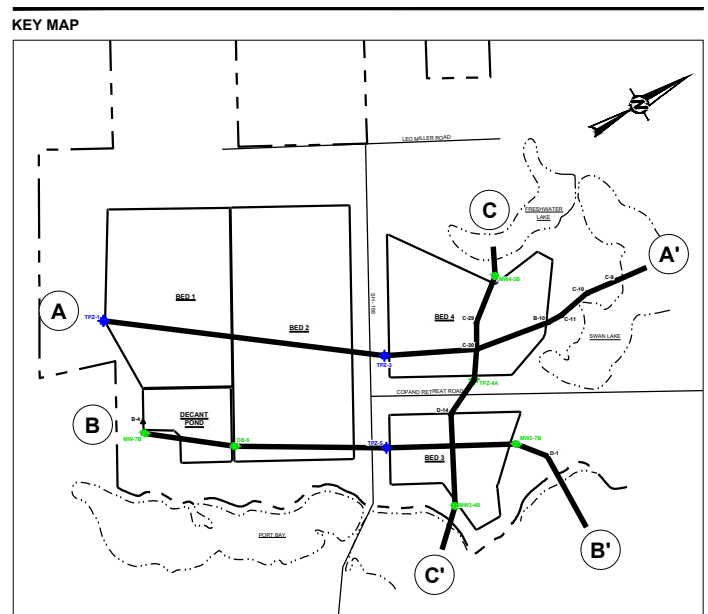
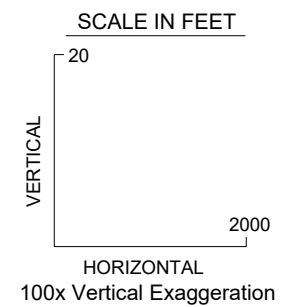
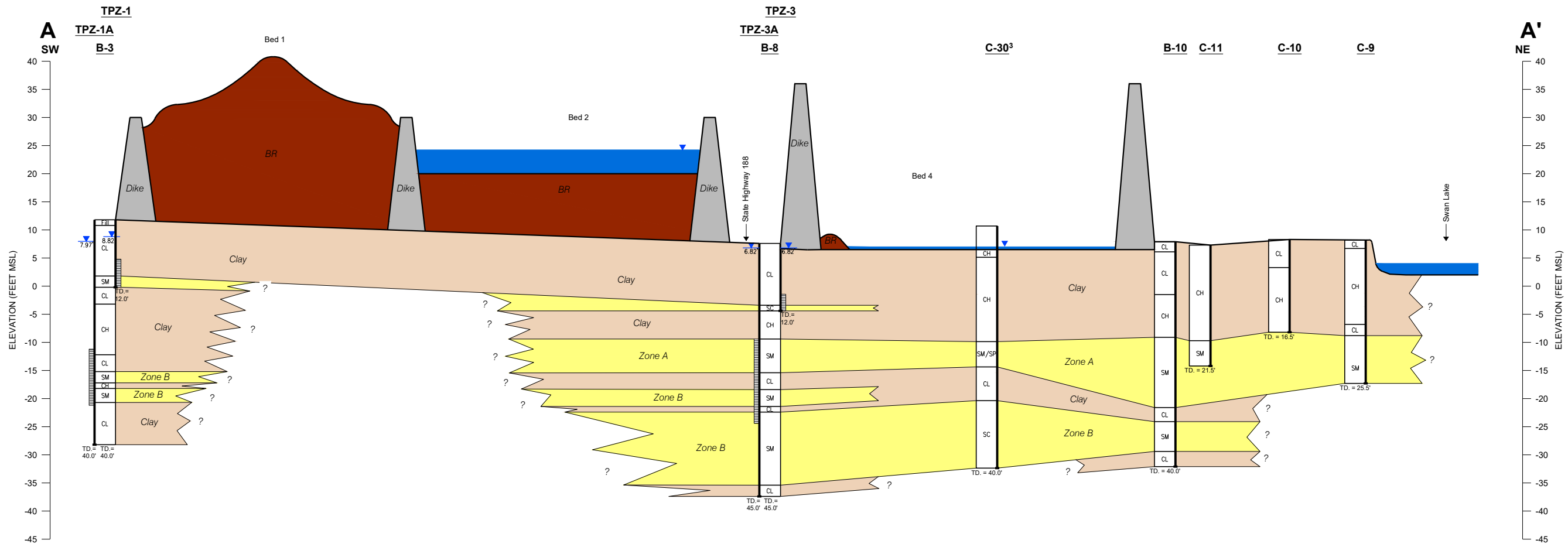
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	DESIGNED	BZH
	PREPARED	PJM
	REVIEWED	MKW
	APPROVED	MKW

PROJECT NO. 18105404      REV. 0      FIGURE 1-2

1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB

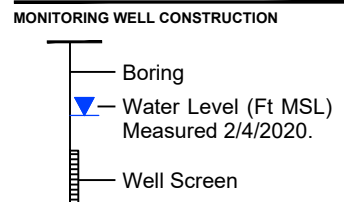


Path: \\usafra\golder\golder\projects\19125525\Copano\2020-03\March\_1\_Fig Name: FIG 2-1 - Geologic Cross Section.dwg | Last Edited By: pmb@bde | Date: 2020-04-29 Time: 4:30:37 PM | Printed By: pmb@bde | Date: 2020-04-29 Time: 4:31:46 PM



**LEGEND**

	DIKE DIKE MATERIAL
	BR BAUXITE RESIDUE
	FILL FILL
	CL SANDY CLAY
	CH SILTY CLAY
	ML CLAYEY SILT
	SM SILTY SAND
	SC CLAYEY SAND



**NOTE(S)**

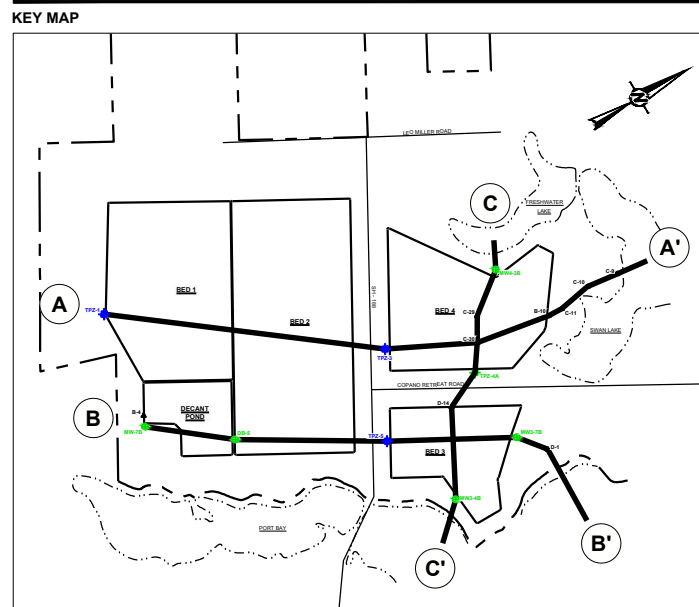
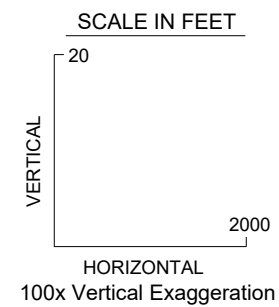
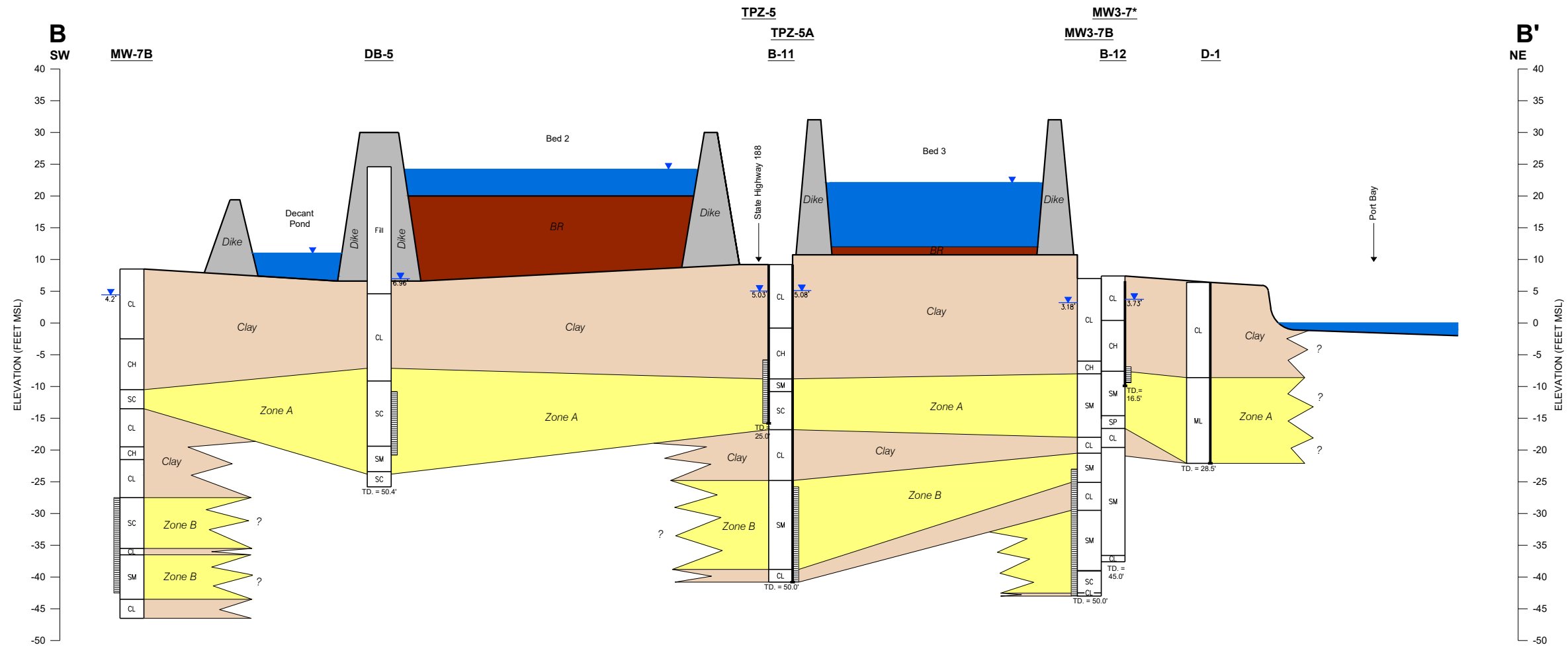
1. WATER LEVELS IN BEDS 2-4 ARE FOR ILLUSTRATIVE PURPOSES ONLY - WATER LEVELS FLUCTUATE BASED ON RAINFALL, PUMPING, ETC.
2. RESIDUE LEVELS IN BED 1 IS BASED ON RECENT TOPOGRAPHIC SURVEY. RESIDUE LEVELS IN BEDS 2-4 ARE APPROXIMATE.
3. C-30 SOIL BORING LOGGED BEFORE CONSTRUCTION OF BED 4. FROM DAMES & MOORE SOIL STUDY (1979).



CLIENT	CE RANCH LLC	
PROJECT	COPANO PROPERTY	
TITLE	GEOLOGIC CROSS SECTION A-A'	
CONSULTANT	YYYY-MM-DD	2020-03-12
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MKW
	APPROVED	MKW
PROJECT NO.	REV.	FIGURE
19125525	0	2-1

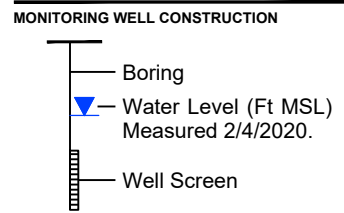
1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

Path: \\uswest\mnts\golder\projects\19125525\Copano\2020-04-22\FIG 2-1 - Geologic Cross Section.dwg | Last Edited By: pmb@bde | Date: 2020-04-22 | Time: 1:41:38 PM | Printed By: Pmb@bde | Date: 2020-04-22 | Time: 1:44:32 PM



**LEGEND**

[Grey Box]	DIKE	DIKE MATERIAL
[Brown Box]	BR	BAUXITE RESIDUE
[Light Brown Box]	FILL	FILL
[Tan Box]	CL	SANDY CLAY
[Light Tan Box]	CH	SILTY CLAY
[Yellow Box]	ML	CLAYEY SILT
[Light Yellow Box]	SM	SILTY SAND
[Light Green Box]	SC	CLAYEY SAND



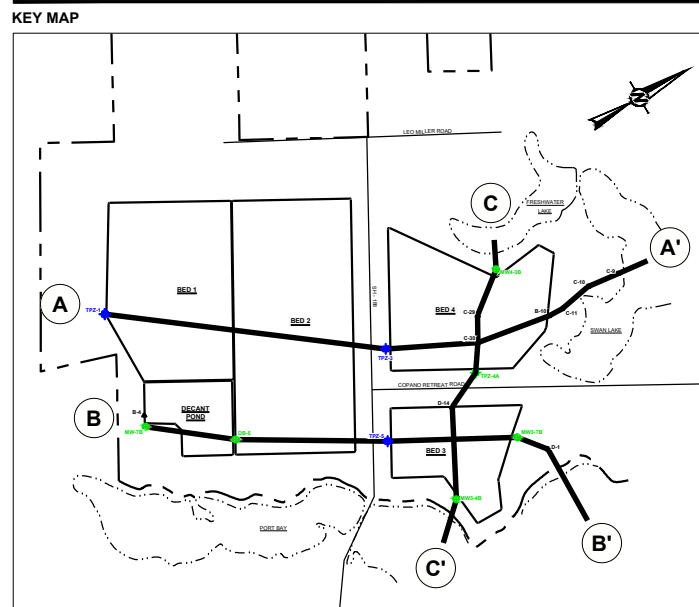
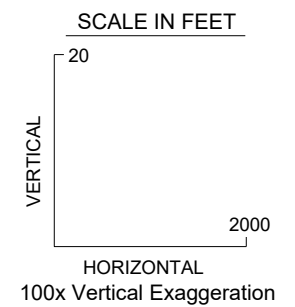
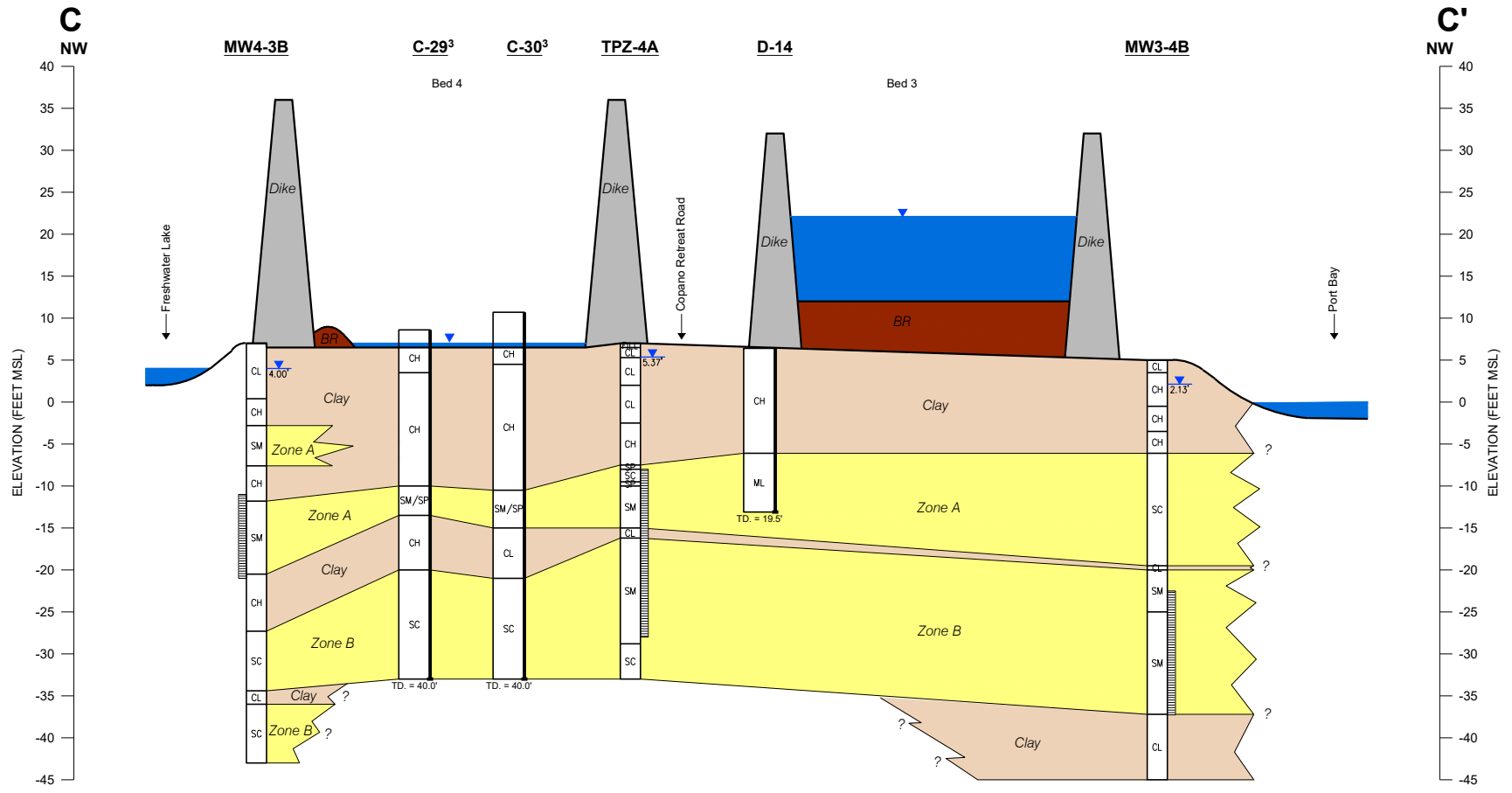
- NOTE(S)**
- \* INDICATES A WELL WITH NO BORING LOG AVAILABLE (ONLY SCREENED INTERVAL AND SURVEY DATA AVAILABLE).
  - WATER LEVELS IN BEDS 2-4 ARE FOR ILLUSTRATIVE PURPOSES ONLY - WATER LEVELS FLUCTUATE BASED ON RAINFALL, PUMPING, ETC.
  - RESIDUE LEVELS IN BED 1 IS BASED ON RECENT TOPOGRAPHIC SURVEY. RESIDUE LEVELS IN BEDS 2-4 ARE APPROXIMATE.



CLIENT	CE RANCH LLC	
PROJECT	COPANO PROPERTY	
TITLE	GEOLOGIC CROSS SECTION B-B'	
CONSULTANT	YYYY-MM-DD	2020-04-22
	DESIGNED	AJD
	PREPARED	PJM
	REVIEWED	MKW
	APPROVED	MKW

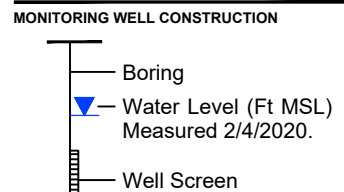
1" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

Path: \\uswest\golder\golder\projects\19125525\Copano\2020-03\March\_1\_Files\Name: FIG 2-3 - Geologic Cross Section.dwg | Last Edited By: pmb@bde | Date: 2020-04-22 | Time: 4:25:19 PM | Printed By: pmb@bde | Date: 2020-04-22 | Time: 4:25:46 PM



**LEGEND**

	DIKE	DIKE MATERIAL
	BR	BAUXITE RESIDUE
	FILL	FILL
	CL	SANDY CLAY
	CH	SILTY CLAY
	ML	CLAYEY SILT
	SM	SILTY SAND
	SC	CLAYEY SAND



**NOTE(S)**

1. WATER LEVELS IN BEDS 2-4 ARE FOR ILLUSTRATIVE PURPOSES ONLY - WATER LEVELS FLUCTUATE BASED ON RAINFALL, PUMPING, ETC.
2. RESIDUE LEVELS IN BED 1 IS BASED ON RECENT TOPOGRAPHIC SURVEY. RESIDUE LEVELS IN BEDS 2-4 ARE APPROXIMATE.
3. C-29 & C-30 SOIL BORING LOGGED BEFORE CONSTRUCTION OF BED 4. FROM DAMES & MOORE SOIL STUDY (1979).



CLIENT	CE RANCH LLC	
PROJECT	COPANO PROPERTY	
TITLE	GEOLOGIC CROSS SECTION C-C'	
CONSULTANT	YYYY-MM-DD	2020-04-22
	DESIGNED	AJD
	PREPARED	PJM
	REVIEWED	MKW
	APPROVED	MKW
PROJECT NO.	REV.	FIGURE
19125525	0	2-3

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



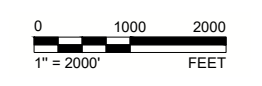
Path: \\usaintern@golder.com\Projects - Victoria\2019\19125525 - Copano\2020-03-March\1 - File Name: FIG 1-2 - Pot Surface Map - Zone A (102020)dwg | Last Edited By: pmabridle Date: 2020-04-17 Time: 4:39:53 PM  
 Date: 2020-04-17 Time: 4:39:53 PM



**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- MW4-1 MONITORING WELL LOCATION (ZONE A)
- MW3-7B MONITORING WELL LOCATION (ZONE B)
- TPZ-2 TEMPORARY PIEZOMETER LOCATION (ZONE A)
- TPZ-2A TEMPORARY PIEZOMETER LOCATION (ZONE B)
- B-7 BORING LOCATION
- (3.26) WATER LEVEL ELEVATION (ft. MSL)  
(MEASURED 2/4/2020)
- -10- - POTENTIOMETRIC CONTOUR  
CONTOUR INTERVAL = 1.0 ft

**REFERENCE(S)**  
 MAP BASED ON AERIAL PHOTOMETRIC MAP BY LANMON AERIAL PHOTOGRAPHY, FLOWN OCTOBER 23, 2019.



CLIENT  
 CE RANCH LLC

PROJECT  
 COPANO PROPERTY

TITLE  
**POTENTIOMETRIC SURFACE MAP - ZONE A**  
 (FEBRUARY 4, 2020)

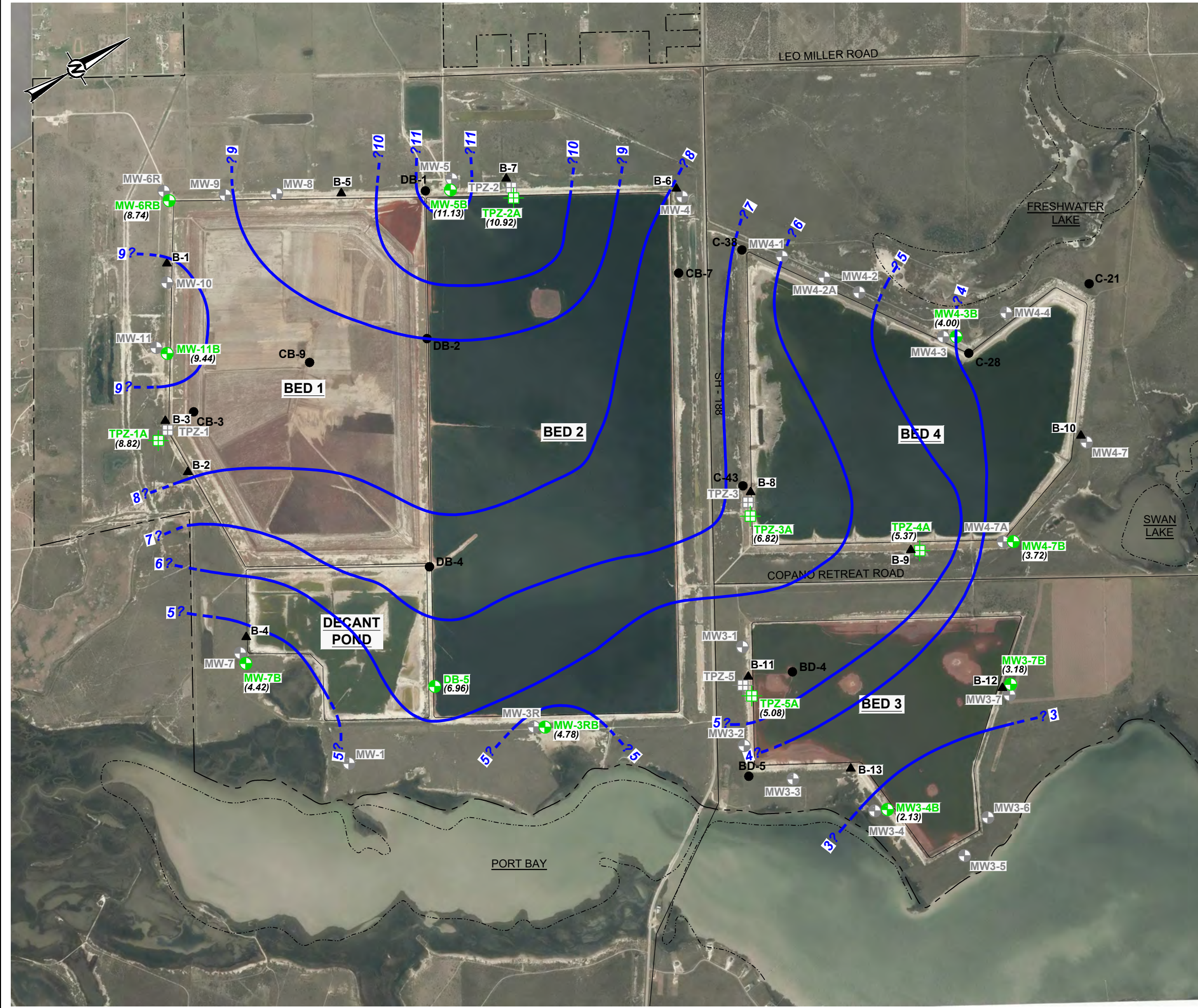
CONSULTANT	YYYY-MM-DD	2020-03-19
DESIGNED	AJD	
PREPARED	PJM	
REVIEWED	SNR	
APPROVED	SNR	

PROJECT NO. 19125525      REV. 0      FIGURE 2-4

1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



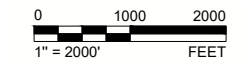
Path: \\usaintern@golder.com\Projects - Victoria\_2019\19125525 - Copano\2020-03-March - Fig 1-2 - Pot Surface Map - Zone B (10/20/20) - Last Edited By: pmb/brd Date: 2020-04-17 Time: 4:37:21 PM  
 Path: \\usaintern@golder.com\Projects - Victoria\_2019\19125525 - Copano\2020-03-March - Fig 1-2 - Pot Surface Map - Zone B (10/20/20) - Last Edited By: pmb/brd Date: 2020-04-17 Time: 4:37:21 PM



**LEGEND**

- APPROXIMATE PROPERTY BOUNDARY
- MW4-1 MONITORING WELL LOCATION (ZONE A)
- ⊕ MW3-7B MONITORING WELL LOCATION (ZONE B)
- ⊠ TPZ-2 TEMPORARY PIEZOMETER LOCATION (ZONE A)
- ⊠ TPZ-2A TEMPORARY PIEZOMETER LOCATION (ZONE B)
- ▲ B-7 BORING LOCATION
- (3.26) WATER LEVEL ELEVATION (ft. MSL)  
(MEASURED 2/4/2020)
- - - -10- POTENTIOMETRIC CONTOUR  
CONTOUR INTERVAL = 1.0 ft

**REFERENCE(S)**  
 MAP BASED ON AERIAL PHOTOMETRIC MAP BY LANMON AERIAL PHOTOGRAPHY, FLOWN OCTOBER 23, 2019.



CLIENT  
 CE RANCH LLC

PROJECT  
 COPANO PROPERTY

TITLE  
**POTENTIOMETRIC SURFACE MAP - ZONE B**  
 (FEBRUARY 4, 2020)

CONSULTANT	YYYY-MM-DD	2020-03-18
DESIGNED	AJD	
PREPARED	PJM	
REVIEWED	SNR	
APPROVED	SNR	

PROJECT NO. 19125525      REV. 0      FIGURE 2-5

1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



Path: \\uswestnara.golder.com\projects\19125525\Copano\2020-03\Mapshp\1\_Fig Name\_ FIG 3-1 - Water Well Location Map.dwg | Last Edited By: jacob@uswestnara.com | Date: 2020-04-17 Time: 4:51:34 PM  
 Path: \\uswestnara.golder.com\projects\19125525\Copano\2020-03\Mapshp\1\_Fig Name\_ FIG 3-1 - Water Well Location Map.dwg | Last Edited By: jacob@uswestnara.com | Date: 2020-04-17 Time: 4:51:34 PM



**LEGEND**

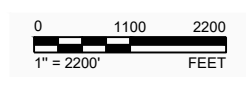
- APPROXIMATE PROPERTY BOUNDARY
- MW4-1 MONITORING WELL LOCATION (ZONE A)
- MW3-7B MONITORING WELL LOCATION (ZONE B)
- TPZ-2 TEMPORARY PIEZOMETER LOCATION (ZONE A)
- TPZ-2A TEMPORARY PIEZOMETER LOCATION (ZONE B)
- WATER WELL LOCATION
- EXTENT OF AFFECTED GROUNDWATER
- 0.5 MILE BUFFER RADIUS

**NOTE(S)**

1. THE EXTENT OF AFFECTED GROUNDWATER HAS BEEN DELINEATED TO RESIDENTIAL HEALTH BASED VALUES FOR INGESTION.
2. ALL WATER WELLS PLOTTED WERE FOUND THROUGH BANKS DATABASE RESULTS EXCEPT WATER WELLS DENOTED WITH AN \*.

**REFERENCE(S)**

MAP BASED ON AERIAL PHOTOMETRIC MAP BY LANMON AERIAL PHOTOGRAPHY, FLOWN OCTOBER 23, 2019.



CLIENT  
**CE RANCH LLC**

PROJECT  
**COPANO PROPERTY**

TITLE  
**WATER WELL LOCATION MAP**

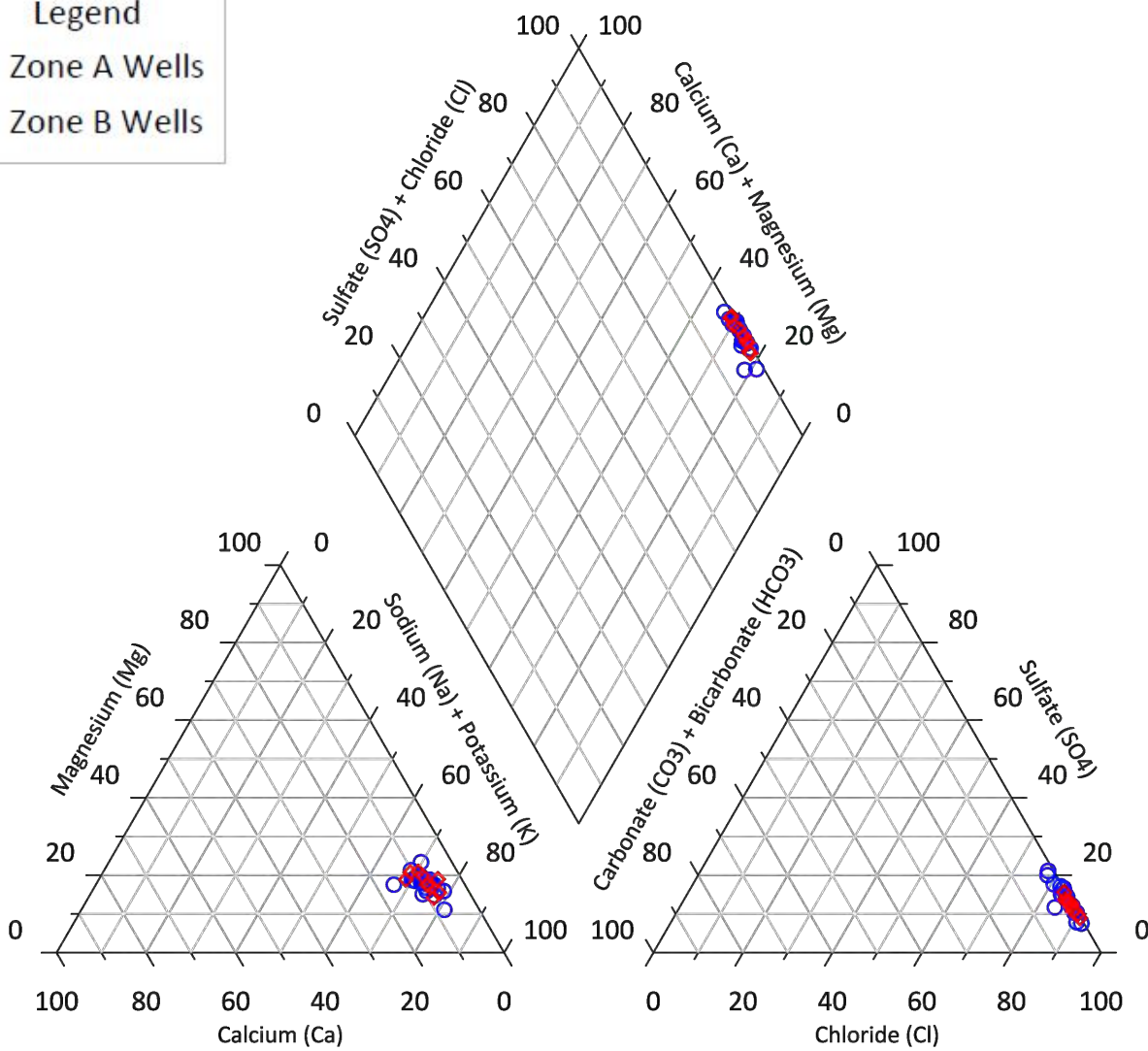
CONSULTANT	YYYY-MM-DD	2020-04-17
	DESIGNED	AJD
	PREPARED	PJM
	REVIEWED	CC
	APPROVED	MKW

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



**Legend**

- Zone A Wells
- ◇ Zone B Wells



CLIENT  
CE RANCH LLC

PROJECT  
COPANO PROPERTY

TITLE  
**PIPER DIAGRAM FOR SAMPLED MONITORING WELLS**

CONSULTANT	YYYY-MM-DD	2020-04-17
	DESIGNED	PJM
	PREPARED	PJM
	REVIEWED	MKW
	APPROVED	MKW



PROJECT NO.  
19125525

REV.  
0

FIGURE  
4-1

# APPENDIX A

## WATER WELL DATABASE SEARCH (BANKS)

**Prepared for:**

GOLDER ASSOCIATES INC-Victoria  
620 E. Airline  
Victoria, TX 77901



# Water Well Report

Copano Beds

TX

San Patricio County

ES-128816

Friday, August 17, 2018



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## Geographic Summary

### Location

San Patricio County, TX

Target location is 6.84 square miles and has a 11.36 mile perimeter

### Coordinates

Longitude & Latitude in Degrees Minutes Seconds NA

Longitude & Latitude in Decimal Degrees NA

X and Y in UTM NA

### Elevation

NA

### Zip Codes Searched

Search Distance	Zip Codes (historical zip codes included)
Target Property	78336, 78382, 78358
0.5 miles	78336, 78374, 78359, 78382, 78358, 78390, 78359

### Topos Searched

Search Distance	Topo Name
Target Property	Bayside (1979), Aransas Pass (1977)
0.5 miles	Bayside (1979), Aransas Pass (1977)

# Summary Map - 0.5 Mile Buffer



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

## Copano Beds

- Well
- Well Cluster
- Target Property
- Search Buffer
- Texas Quad Index

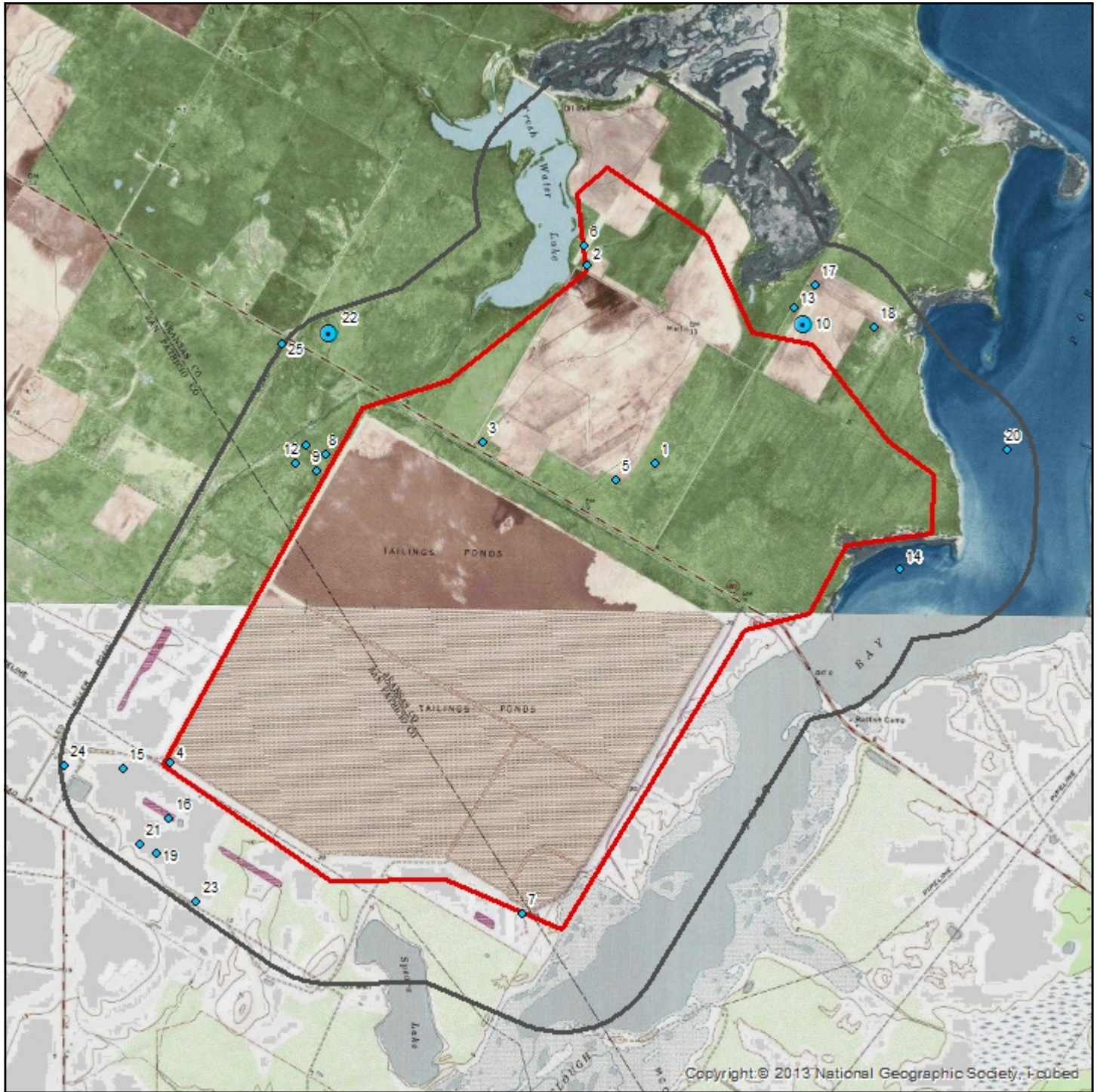
1 : 45,000  
 1 inch = 0.710 miles  
 1 inch = 3750 feet  
 1 centimeter = 0.450 kilometers  
 1 centimeter = 450 meters

Lambert Conformal Conic Projection  
 1983 North American Datum  
 First Standard Parallel: 33° 00' North  
 Second Standard Parallel: 45° 00' North  
 Central Meridian: 96° 00' West  
 Latitude of Origin: 39° 00' North





# Topographic Overlay Map - 0.5 Mile Buffer



Copyright © 2013 National Geographic Society, i-cubed

## Copano Beds

- Well
- Well Cluster

- Target Property
- Search Buffer

Target Property Quad Name(s)  
Bayside (1979), Aransas Pass (1977)

1 : 45,000  
1 inch = 0.710 miles  
1 inch = 3750 feet

Lambert Conformal Conic Projection  
1983 North American Datum  
First Standard Parallel: 33° 00' North  
Second Standard Parallel: 45° 00' North  
Central Meridian: 96° 00' West  
Latitude of Origin: 39° 00' North





# Current Imagery Overlay Map - 0.5 Mile Buffer



Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

## Copano Beds

- Well
- Well Cluster
- Target Property
- Search Buffer

1 : 45,000  
1 inch = 0.710 miles  
1 inch = 3750 feet  
1 centimeter = 0.450 kilometers  
1 centimeter = 450 meters



Lambert Conformal Conic Projection  
1983 North American Datum  
First Standard Parallel: 33° 00' North  
Second Standard Parallel: 45° 00' North  
Central Meridian: 96° 00' West  
Latitude of Origin: 39° 00' North



## Water Well Details

Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	79-63-8	TX TCEQ HIST	A.P. Mariculture	Irrigation	338	11/06/1997	-97.1811	28.010649	3 ft	<a href="#">View</a>
2	79-63-802	TX TWDB GW	Bankers Mortgage Co.	Stock	190	01/01/1962	-97.186667	28.024444	3 ft	<a href="#">View</a>
3	79-63-803	TX TWDB GW	Bankers Mortgage Co.	Stock	190	01/01/1938	-97.194722	28.011945	6 ft	<a href="#">View</a>
4	83-07-102	TX TWDB GW	Leo A. Miller	Stock	190	n/a	-97.219167	27.989167	12 ft	<a href="#">View</a>
5	161837	TX TWDB SDR	Max Kluge	Domestic	150	2/13/2005	-97.184167	28.009445	3 ft	<a href="#">View</a>
6	66549	TX TWDB SDR	Vic & Linda Ostrum	Domestic	185	2/19/2004	-97.186945	28.025833	5 ft	<a href="#">View</a>
7	143052	TX TWDB SDR	Xeric Oil & Gas Corp.	Industrial	233	8/16/2004	-97.191111	27.978889	5 ft	<a href="#">View</a>
8	79-63-8	TX TCEQ HIST	Stephen Bodnar	Domestic	278	04/18/1984	-97.207149	28.01099	9 ft	<a href="#">View</a>
9	79-63-8B	TX TCEQ HIST	Larry Morgan	Domestic	280	04/14/1984	-97.207933	28.009787	9 ft	<a href="#">View</a>
10	160290	TX TWDB SDR	Owen Stowe	Domestic	385	4/26/2005	-97.169444	28.020555	9 ft	<a href="#">View</a>
10	159947	TX TWDB SDR	John Hurt	Domestic	320	5/16/2005	-97.17	28.019444	9 ft	<a href="#">View</a>
11	79-63-8B	TX TCEQ HIST	Carole Bennett	Domestic	282	04/20/1984	-97.208791	28.01153	9 ft	<a href="#">View</a>
12	79-63-8B	TX TCEQ HIST	JJ Parker	Domestic	275	04/19/1984	-97.209563	28.010317	10 ft	<a href="#">View</a>
13	160284	TX TWDB SDR	Owen Stowe	Domestic	400	5/2/2005	-97.170278	28.021667	7 ft	<a href="#">View</a>
14	428609	TX TWDB SDR	Bobby Tedder	Domestic	160	6/14/2016	-97.161639	28.003389	ft	<a href="#">View</a>
15	83-07-1	TX TCEQ HIST	Ken Smith	Domestic	243	03/07/02	-97.222867	27.988757	14 ft	<a href="#">View</a>
16	168554	TX TWDB SDR	Oscar Osorto	Irrigation	91	2/16/2009	-97.219167	27.985278	13 ft	<a href="#">View</a>
17	79-63-801	TX TWDB GW	Bankers Mortgage Co.	Unused	199	01/01/1956	-97.168611	28.023333	6 ft	<a href="#">View</a>
18	79-63-9F	TX TCEQ HIST	Resource Management	Industrial	200	11/29/1984	-97.163904	28.020403	6 ft	<a href="#">View</a>
19	83-07-1	TX TCEQ HIST	Keith Hood	Irrigation	159	11/29/1999	-97.22012	27.982807	14 ft	<a href="#">View</a>
20	441047	TX TWDB SDR	Wells Collection McLean Residence	Domestic	167	1/13/2017	-97.153333	28.011944	ft	<a href="#">View</a>
21	83-07-1B	TX TCEQ HIST	Jacques Valley	Domestic	215	05/05/76	-97.221494	27.983413	14 ft	<a href="#">View</a>
22	136832	TX TWDB SDR	DAN A HUGHES	Rig Supply	300	8/3/2007	-97.206945	28.019444	10 ft	<a href="#">View</a>
22	136831	TX TWDB SDR	DAN A HUGHES	Rig Supply	326	7/31/2007	-97.207223	28.019167	10 ft	<a href="#">View</a>
23	42379	TX TWDB SDR	Abel Adame	Domestic	247	6/20/2003	-97.216944	27.979444	14 ft	<a href="#">View</a>
24	83-07-104	TX TWDB GW	Bankers Mortgage Co.	Domestic	280	01/01/1927	-97.2275	27.988889	15 ft	<a href="#">View</a>
25	79-63-7	TX TCEQ HIST	David Martinez	Domestic	250	05/04/1998	-97.210759	28.018613	10 ft	<a href="#">View</a>

### Well Summary

Water Well Dataset	# of Wells
TX TCEQ HIST	10
TX TWDB GW	5
TX TWDB SDR	12
<b>Total Count</b>	<b>27</b>

## Dataset Descriptions and Sources



Dataset	Source	Dataset Description	Update Schedule	Data Requested	Data Obtained	Data Updated	Source Updated
TX HGSD - Texas HGSD	Harris Galveston Subsidence District/Fort Bend Subsidence District	This dataset contains all groundwater well records compiled by Harris Galveston Subsidence District/Fort Bend Subsidence District.	Quarterly	08/13/2018	04/19/2018	04/22/2018	04/19/2018
TX TCEQ HIST - Texas TCEQ Historical	Texas Commission on Environmental Quality	This dataset contains all historical water well records searched from the TCEQ Public Water Well Viewer. Banks Environmental Data plots each well record based on location information found on the log.	As requested	N/A	N/A	N/A	N/A
TX TCEQ PWS - Texas TCEQ PWS	Texas Commission on Environmental Quality	This dataset contains a collection of records from Texas Water Districts, Public Drinking Water Systems and Water and Sewer Utilities who submit information to the TCEQ.	Quarterly	08/13/2018	04/18/2018	04/22/2018	04/18/2018
TX TWDB GW - Texas TWDB Groundwater Database	Texas Water Development Board	This dataset contains water well records contained within Texas Water Development Board Groundwater Database.	Quarterly	04/20/2018	04/20/2018	04/22/2018	04/19/2018
TX TWDB SDR - Texas TWDB Submitted Drillers Reports	Texas Water Development Board	This dataset contains water well records from the Texas Water Development Board Submitted Drillers Reports Database.	Quarterly	04/17/2018	04/17/2018	04/22/2018	04/16/2018
WW USGS - USGS Water Wells	U.S. Geological Survey	This dataset contains groundwater well records from the U.S. Geological Survey.	Semi-annually	06/06/2018	06/06/2018	06/10/2018	06/06/2018

## Disclaimer



The Banks Environmental Data Water Well Report was prepared from existing state water well databases and/or additional file data/records research conducted at the state agency and the U.S. Geological Survey. Banks Environmental Data has performed a thorough and diligent search of all groundwater well information provided and recorded. All mapped locations are based on information obtained from the source. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the actual driller. It may be possible that some water well schedules and logs have never been submitted to the regulatory authority by the water driller and, thus, may explain the possible unaccountability of privately drilled wells. It is uncertain if the above listing provides 100% of the existing wells within the area of review. Therefore, Banks Environmental Data cannot fully guarantee the accuracy of the data or well location(s) of those maps and records maintained by the regulatory authorities.



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