R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

June 7, 2016

Ms. Heather Patterson
Mr. Mike Bratcher
Mr. Bradford Billings
NMOCD District 2
811 S. First Street
Artesia, New Mexico 88210
Via E-mail

RE: C-147 for Matador Production Company
Tiger Recycling Facility and Containment, Section 14 R24S R28E

Dear Ms. Patterson, Mr. Bratcher and Mr. Billings:

On behalf of Matador Production Company, R.T. Hicks Consultants, Ltd. is pleased to submit a registration/permit package for the above-referenced project. The on-site auger boring log, which is part of Volume 1, defines the depth to groundwater in the area of the proposed site as 51 feet below grade. Due to a recent finding that the proposed pad upon which the Above Ground Tank (AST) Containments will rest will be about 4 feet *lower* than elevation of the auger boring, the distance between the bottom of the containment and groundwater is about 47 feet. Therefore, Volume 1 includes a variance request for the 50-foot setback from groundwater.

Because of the distance between the bottom of the containment and groundwater is less than 50 feet, the Closure Plan calls for meeting closure concentration standards more stringent from Table 1 of the Rule. We borrowed a chloride "clean closure" standard of 600 mg/kg from the soil cover design mandate in the Pit Rule and hydrocarbon closure standards from the small land farm section of the Surface Waste Rule.

The design, construction and operation of the AST containments is the same as approved by OCD for the Hackberry containment of 2RF 102-0 (2015). Please note the following in Volume 2:

1. The secondary liner for the AST system is reinforced 30-mil LLDPE-r.
2. The primary liner system is two (2) liners composed of reinforced 30-mil LLDPE-r. This primary liner system is an OCD-approved variance, which is included in Volume 2.
3. The design documents for the Big Holding Tanks are stamped by a Professional Engineer.
4. ASTs require a variance from the Rule for the side slope and anchor trench mandate. We include the previously-approved variance regarding this issue.
5. The variance to allow for less than 3-feet of freeboard in a containment is also an approved variance. The Operations Plan calls for maintaining 2-feet of freeboard.

6. The recycling facility and containments are on private surface and subject to a lease with the owner for this purpose. Matador has transmitted a copy of this registration to the surface owner.
7. Matador Production has signed the C-147 certifying that the proposed action, with approved variances, complies with OCD Rules and is compliant with the Financial Assurance mandates of the Rule.

Initial grading of the pad for the ASTs should begin this week. Pending OCD approval of the variance, operation and produced water recycling should begin before the end of this month.

As discussed with Mr. Bratcher today, Matador Production will separately submit

1. A map showing the location of
    a. the recycling facility
    b. wells currently scheduled for hydraulic stimulation with produced water
    c. possible locations of wells that may be stimulated with produced water in the future
2. A description of the method and materials used to transport produced water from the recycling facility to the wells undergoing stimulation
3. A description of the flowline monitoring system to identify any release of produced water.

We understand that OCD appreciates this voluntary submission as it allows OCD to more quickly respond to any concerns that surface owners or others may have relating to the recycling of produced water in this area.

Please contact me or Kristin Pope with any questions or comments.

Sincerely,
R.T. Hicks Consultants

Randall Hicks
Principal
Copy: Matador Production Company
Select Energy Services

June 2016

C-147 Registration Package for Tiger Recycling Containment and Recycling Facility Section 14 T24S R28E, Eddy County

Volume 1
C-147
Site Specific Groundwater Data
Siting Criteria Compliance Demonstrations
Appendix A – Site Inspection Photographs and Location
Appendix B – Auger Boring Log

View northeast from southwest corner of proposed Tiger Recycling Containment.

Prepared for:
Matador Production Company
Dallas, Texas
And
Select Energy Services

Prepared by:

R.T. Hicks Consultants, Ltd.
901 Rio Grande NW
F-142
Albuquerque, New Mexico

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Department
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-147
Revised March 31, 2015

Recycling Facility and/or Recycling Containment

Type of Facility: ☒ Recycling Facility ☒ Recycling Containment*****

Type of action: ☐ Permit ☒ Registration
☐ Modification ☐ Extension
☐ Closure ☐ Other (explain) _____

*** At the time C-147 is submitted to the division for a Recycling Containment, a copy shall be provided to the surface owner.**

Be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.

Operator: _Matador Production Company. _____(For multiple operators attach page with information) OGRID #:___228937_____

Address: __One Lincoln Centre 5400 LBJ Freeway. Suite 1500 Dallas, TX. 75240 _____

Facility or well name (include API# if associated with a well): _Tiger Recycling Facility API# Not Applicable_____

OCD Permit Number: _____(For new facilities the permit number will be assigned by the district office)

U/L or Qtr/Qtr _____ Section _____14_____ Township ____24S_____ Range ____28E_____ County: __Eddy_____

Surface Owner: ☐ Federal ☐ State ☒ Private ☐ Tribal Trust or Indian Allotment

2.

☒ **Recycling Facility:**

Location of recycling facility (if applicable): Latitude ___ 32.211082___ Longitude -104.052335___ NAD: ☐1927 ☒ 1983 (Google Earth)

Proposed Use: ☒ Drilling* ☒ Completion* ☒ Production* ☒ Plugging *

The re-use of produced water may NOT be used until fresh water zones are cased and cemented

☐ Other, ***requires permit for other uses. Describe use, process, testing, volume of produced water and ensure there will be no adverse impact on groundwater or surface water.***

☒ Fluid Storage

☒ Above ground tanks ☐ Recycling containment ☐ Activity permitted under 19.15.17 NMAC explain type_____

☐ Activity permitted under 19.15.36 NMAC explain type:_____ ☐ Other explain _____

☐ For multiple or additional recycling containments, attach design and location information of each containment

☐ **Closure Report (required within 60 days of closure completion):** ☐ Recycling Facility Closure Completion Date:_____

3.

☒ **Recycling Containment:** Five ASTs

☐ Annual Extension after initial 5 years (attach summary of monthly leak detection inspections for previous year)

Center of Recycling Containment (if applicable):): Latitude ___ 32.211082___ Longitude -104.052335___ NAD: ☐1927 ☒ 1983

☒ For multiple or additional recycling containments, attach design and location information of each containment

☒ Lined ☒ Liner type: Thickness _two 30_mil (Primary) one 30-mil (Secondary) ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other __

☒ String-Reinforced

Liner Seams: ☐ Welded ☒ Factory ☐ Other _____ Volume: _41,000 each_ bbl each Dimensions: __diameter 161 ft, height 12 ft __

☐ Recycling Containment Closure Completion Date:_____

4.

Bonding:

☒ Covered under bonding pursuant to 19.15.8 NMAC per 19.15.34.15(A)(2) NMAC **(These containments are limited to only the wells owned or operated by the owners of the containment.)**

☐ Bonding in accordance with 19.15.34.15(A)(1). Amount of bond $_____ **(work on these facilities cannot commence until bonding amounts are approved)**

☐ Attach closure cost estimate and documentation on how the closure cost was calculated.

5.

Fencing:

☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet

☐ Alternate. Please specify_____

6.

Signs:

☒ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers

☐ Signed in compliance with 19.15.16.8 NMAC

7.

Variances:

Justifications and/or demonstrations that the proposed variance will afford reasonable protection against contamination of fresh water, human health, and the environment.

Check the below box only if a variance is requested:

☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. If a Variance is requested, include the variance information on a separate page and attach it to the C-147 as part of the application.

If a Variance is requested, it must be approved prior to implementation.

ALL CONSTRUCTION AND OPERATION VARIANCES (VOLUME 2) HAVE BEEN PREVIOUSLY APPROVED BY OCD

8.

Siting Criteria for Recycling Containment

Instructions: The applicant must provide attachments that demonstrate compliance for each siting criteria below as part of the application. Potential examples of the siting attachment source material are provided below under each criteria.

General siting

Ground water is less than 50 feet below the bottom of the Recycling Containment. ***See Appendix B, Figures 1 and 2 and Variance*** NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☒ Yes ☐ No ☐ NA
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. ***See Figure 5*** - Written confirmation or verification from the municipality; written approval obtained from the municipality	☐ Yes ☒ No ☐ NA
Within the area overlying a subsurface mine. ***See Figure 7*** - Written confirmation or verification or map from the NM EMNRD-Mining and Minerals Division	☐ Yes ☒ No
Within an unstable area. ***See Figure 8*** - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; topographic map	☐ Yes ☒ No
Within a 100-year floodplain. FEMA map ***See Figure 9***	☐ Yes ☒ No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). ***See Figure 3*** - Topographic map; visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; aerial photo; satellite image ***See Figure 4***	☐ Yes ☒ No
Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application. ***See Figures 1 and 2*** - NM Office of the State Engineer - iWATERS database search; visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 500 feet of a wetland. ***See Figure 6*** - US Fish and Wildlife Wetland Identification map; topographic map; visual inspection (certification) of the proposed site	☐ Yes ☒ No

9.
Recycling Facility and/or Containment Checklist:
Instructions: Each of the following items must be attached to the application. Indicate, by a check mark in the box, that the documents are attached.

- ☒ Design Plan - based upon the appropriate requirements. ***Appendices C and D***
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements. ***Appendix F***
- ☒ Closure Plan - based upon the appropriate requirements. ***Appendix G***
- ☒ Site Specific Groundwater Data – Volume 1
- ☒ Siting Criteria Compliance Demonstrations – Volume 1
- ☒ **Certify that notice of the C-147 (only) has been sent to the surface owner(s)**

10.
Operator Application Certification:
I hereby certify that the information and attachments submitted with this application are true, accurate and complete to the best of my knowledge and

Name (Print): Cliff Humphreys Title: Engineer

Signature: Date: June 7, 2016

e-mail address: chumphreys@matadorresources.com Telephone: 972-371-5288

11.
OCD Representative Signature: Bradford Billings **Approval Date:** June 23, 2016

Title: Hydrologist-District II OCD **OCD Permit Number:**

☒ OCD Conditions See Attached email response
☐ Additional OCD Conditions on Attachment

Distance to Groundwater

Figure 1, Figure 2, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is NOT greater than 50 feet beneath the containment and a variance request is included in this submission

Figure 1 is a geologic/ topographic map that shows:

1. The location of the proposed containment with the surface elevation.
2. Water wells from the OSE database are plotted as a blue triangle inside colored circles that indicate well depth (see legend). OSE wells are often mis-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range.
3. Water wells from the USGS database as large colored triangles that represent the unit in which the well was completed.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares.
5. The depth-to-water from the most recent available measurement for each well is provided adjacent to the well symbol.
6. Shown on Figure 1 is the on-site boring completed on May 10, 2016. The soil boring shows that depth to water is 53.17 below ground surface of the boring. The surface elevation of the boring is approximately 2956 ft msl, as interpolated from a USGS topographic map.

Hydrogeology

Our examination of the geology of the area near the proposed containment causes us to conclude that the uppermost water-bearing zone lay in the Permian Rustler Formation. The Rustler is exposed at the surface due north of the proposed containment (see site inspection photographs in Appendix A). Data from an on-site boring allow us to conclude that groundwater is in the Rustler and the unit is unconfined. Measured depth to water from ground surface in the auger boring was 53.17 feet.

The 1983 driller's log for the well northwest of the proposed containment (C-2057 on Figure 1 and Misc- 315 on Figure 2 is presented below. While the log states that the depth to groundwater upon completion of the well is 52 feet, the log shows water encountered at 90 feet below surface. As this well was drilled with a cable tool rig, identification of the lithology and depth to the saturated a groundwater zone capable of providing water for beneficial use is not difficult to accurately determine. These data support the conclusion that the shale and sand stringers identified between 50-90 feet are Rustler Formation rather than fine-grained overbank deposits from the ancestral Pecos River or relict Ogallala Formation.

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	5	5	Topsoil
5	50	45	Sandy clay & caliche
50	90	40	Shale with some sand stringers
90	125	35	Sand and gravel-water
125	126	1	Shale

Saturated alluvium exists north and east of the location, within the floodplain of the Pecos River. As suggested in the next section, the groundwater system in the alluvium appears to be poorly connected with respect to water pressure to permeable units (e.g. fractured dolomite) in the Rustler that yields water to wells.

A description of the lithologic log from the May 10, 2016 auger boring at the site is presented in Appendix B. The results of the boring document that dry Permian claystone (Rustler Formation) compose the majority of the stratigraphic column. Dry claystone exists at 48 feet below land surface. Moist/wet rock was encountered at 51 feet and fully-saturated sediment was obvious at a depth of 54 feet. After completion of the boring, depth to groundwater was measured at 53.17 feet, which results in a ground water elevation of 2903.83.

Depth to Groundwater

Figure 2 is topographic map at a larger scale that shows:

1. The location of the proposed containment.
2. Water wells measured by the USGS or other professionals, the formation completion depth of the well (see Figure 1 Legend) and the calculated elevation of the groundwater surface and the date of the observation.
3. Isocontour lines displaying the elevation of the groundwater surface of the Rustler Formation.

We relied upon the most recent data measured by the USGS to create the water table elevation map shown in Figure 2 as well as the "Misc" well data (see Figure 1). The Misc data are measured water levels in wells or logged borings for hydrogeologic information. This dataset can contain errors (generally of location) that are not often present in the USGS data; but all of the Misc wells with water elevation data in Figure 2 have been inspected by Hicks Consultants. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. The OSE dataset provides some useful data in certain areas.

For the potentiometric surface map (Figure 2), we honored all data that we know are accurate to the best of our knowledge.

From these data, we conclude:

- Based upon the groundwater map of the regional aquifer (permeable units in the Rustler and Pecos River Alluvium), the elevation of the potentiometric surface is about 2,904 feet above sea level at the location of the containment
- The elevation of the containment pad surface has not been established, as the pad is not yet constructed or surveyed. A recent site meeting with the construction contractor revealed that the elevation of the constructed pad will be about 4-feet lower than the ground surface of the auger boring. Thus, the distance from the bottom of the AST containment and the uppermost groundwater zone is less than 50 feet.
- The cable-tool boring (well Misc. 341) near the proposed containment location suggests that the first saturated unit that will yield water for beneficial use is 90 feet below land surface.

- The on-site auger boring documents under-saturated sediments at 51 feet (capillary fringe) and fully saturated sediments are obvious at 54 feet below surface
- The measured depth to water of 53.17 feet below grade was obtained about 15 minutes after auger drilling operations ceased.
- This groundwater zone encountered at 54 feet below grade in the auger boring may not be capable of yielding sufficient water for beneficial use, based upon the driller's log of Misc 341 (C 2057)

Distance to Surface Water

Figure 3 and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse or any other significant watercourse or 200 feet from lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- No continuously flowing watercourses or other water bodies, as defined by NMOCD Rules, exist within the prescribed setback criteria for containment.
- Except for mapped irrigation well storage ponds north and southeast of the location, the nearest surface water is the Pecos River 1.17 miles east of the location.
- We examined a depression approximately 0.5 miles west of the location. This low area exhibited no evidence of collapse features, unstable ground or wetland vegetation.

Distance to Permanent Residence or Structures

Figure 4 and the site visit demonstrates that the location is not within 1000 feet from an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.

- The nearest structures are oil and gas wells and tank batteries.
- A hay storage barn exists northeast of the location

Distance to Non-Public Water Supply

Figures 1 and Figure 2 demonstrates that the location is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1,000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.

- Figure 1 shows the locations of all area water wells, active or plugged.
- The nearest water well is located approximately 1500 feet northwest. This is the abandoned water well shown in the site inspection photographs.
- There are no known domestic water wells located within 1,000 feet of the proposed containment. The closest domestic supply well is probably adjacent to an abandoned dwelling located about 2500 feet northeast of the location.
- No springs were identified within the mapping area (see Figure 3).

Distance to Municipal Boundaries and Fresh Water Fields

Figure 5 demonstrates that the location is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended

- The closest municipality is Carlsbad, NM approximately 18 miles to the northwest.

- The closest public well field is located approximately 20 miles to the west.

Distance to Wetlands

Figure 6 demonstrates the location is not within 300 feet of wetlands.

- The nearest designated wetland is Willow Lake located approximately 1.7 miles to the southwest

Distance to Subsurface Mines

Figure 7 and our general reconnaissance of the area demonstrate that the nearest mines are caliche/gravel pits. This location is not within an area overlying a subsurface mine.

- The nearest mapped caliche/gravel pit is located approximately 5 miles to the southeast.
- The nearest gravel pit is about 1 mile east.

Distance to High or Critical Karst Areas

Figure 8 shows the location of the temporary containments with respect to BLM Karst areas.

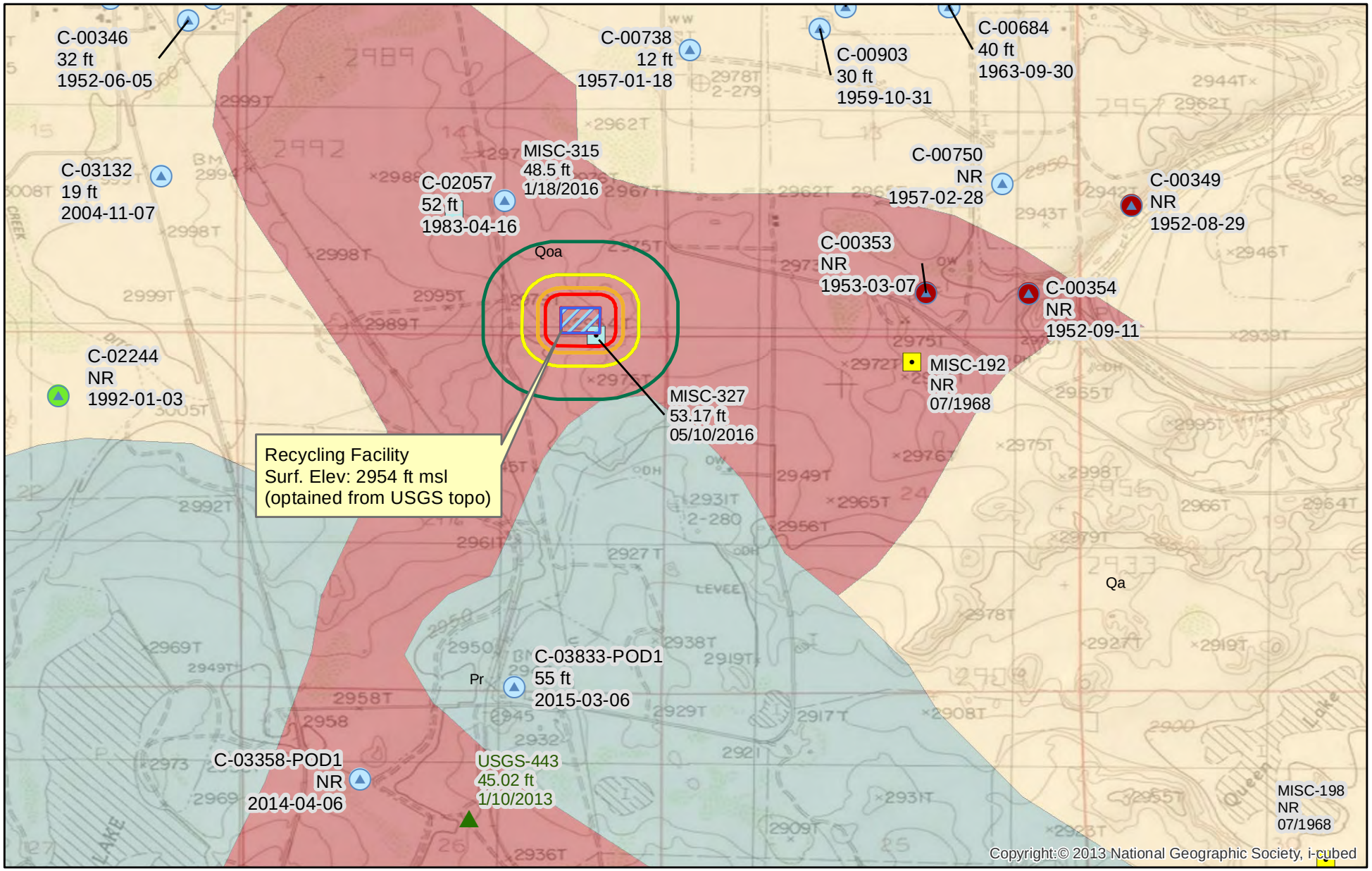
- The proposed temporary containment is located within a "moderate" potential karst area.
- The nearest "high" or "critical" potential karst area is located approximately 1.4 miles southwest near Willow Lake.
- No evidence of solution voids were observed near the site during the field inspection.
- A professional geologist (Randall Hicks) conducted the field survey and concluded that the ground is stable.

Distance to 100-Year Floodplain

Figure 9 demonstrates that the location is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.

- Zone X is described as areas outside the 0.2% Annual Chance Flood Plain
- Our field inspection and examination of the topography permits a conclusion that the location has low risk for flooding.

Site Specific Figures



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Albuquerque, NM 87104
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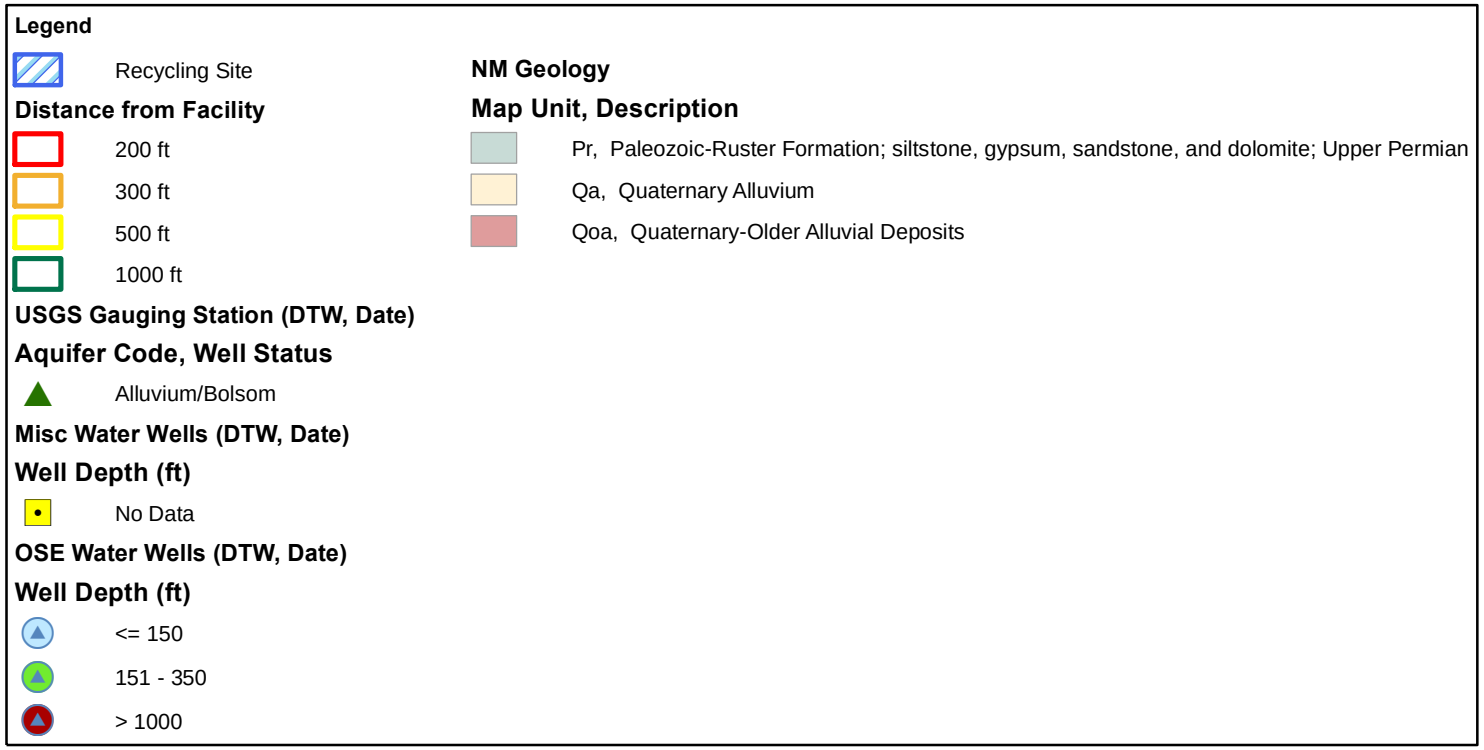
Depth To Water and Geology

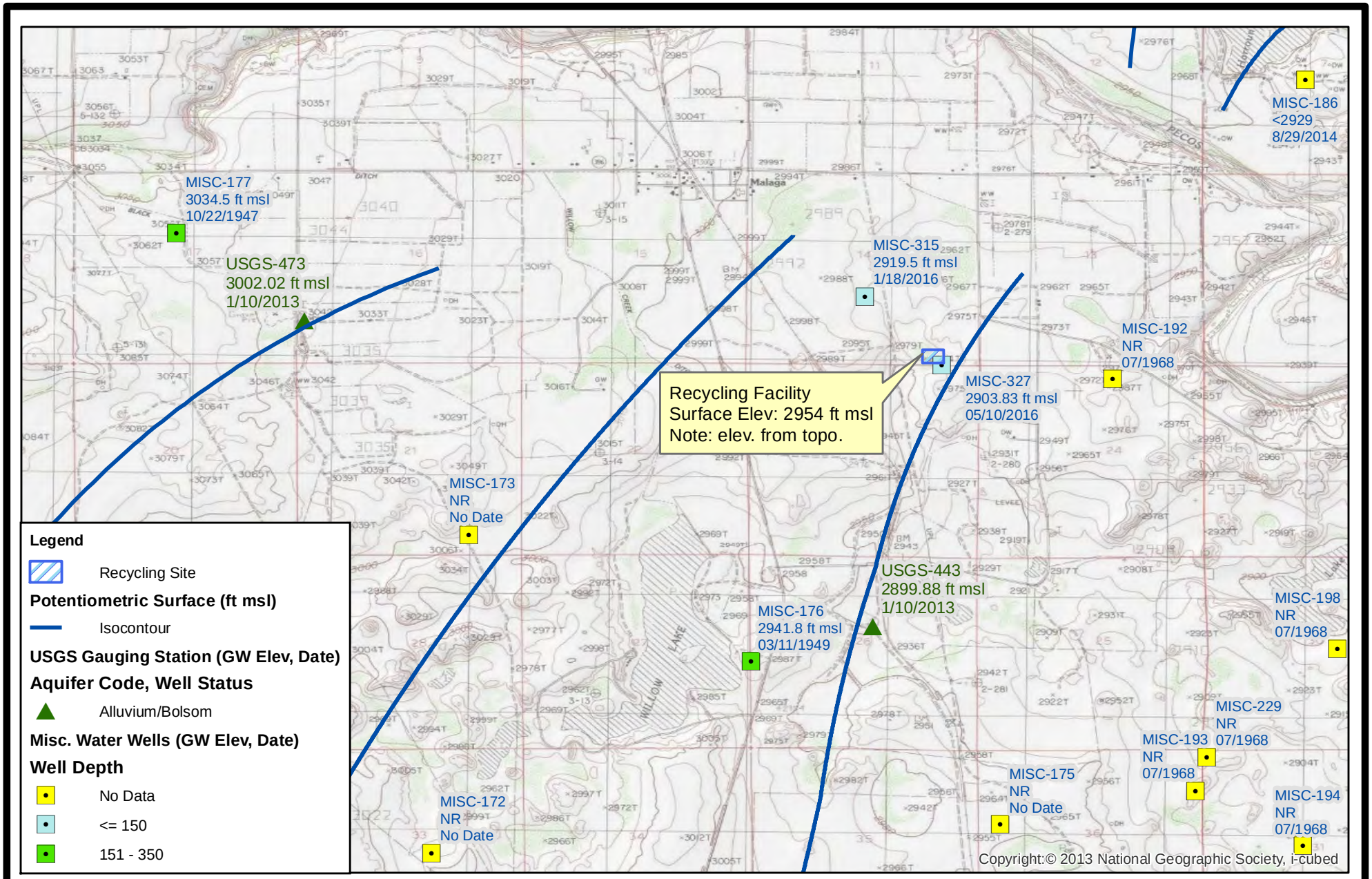
Figure 1

Matador Production Company
Tiger Recycling Facility

May 2016



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Legend - Depth To Water and Geology	Figure 1 Legend
	Matador Production Company Tiger Recycling Facility	February 2016



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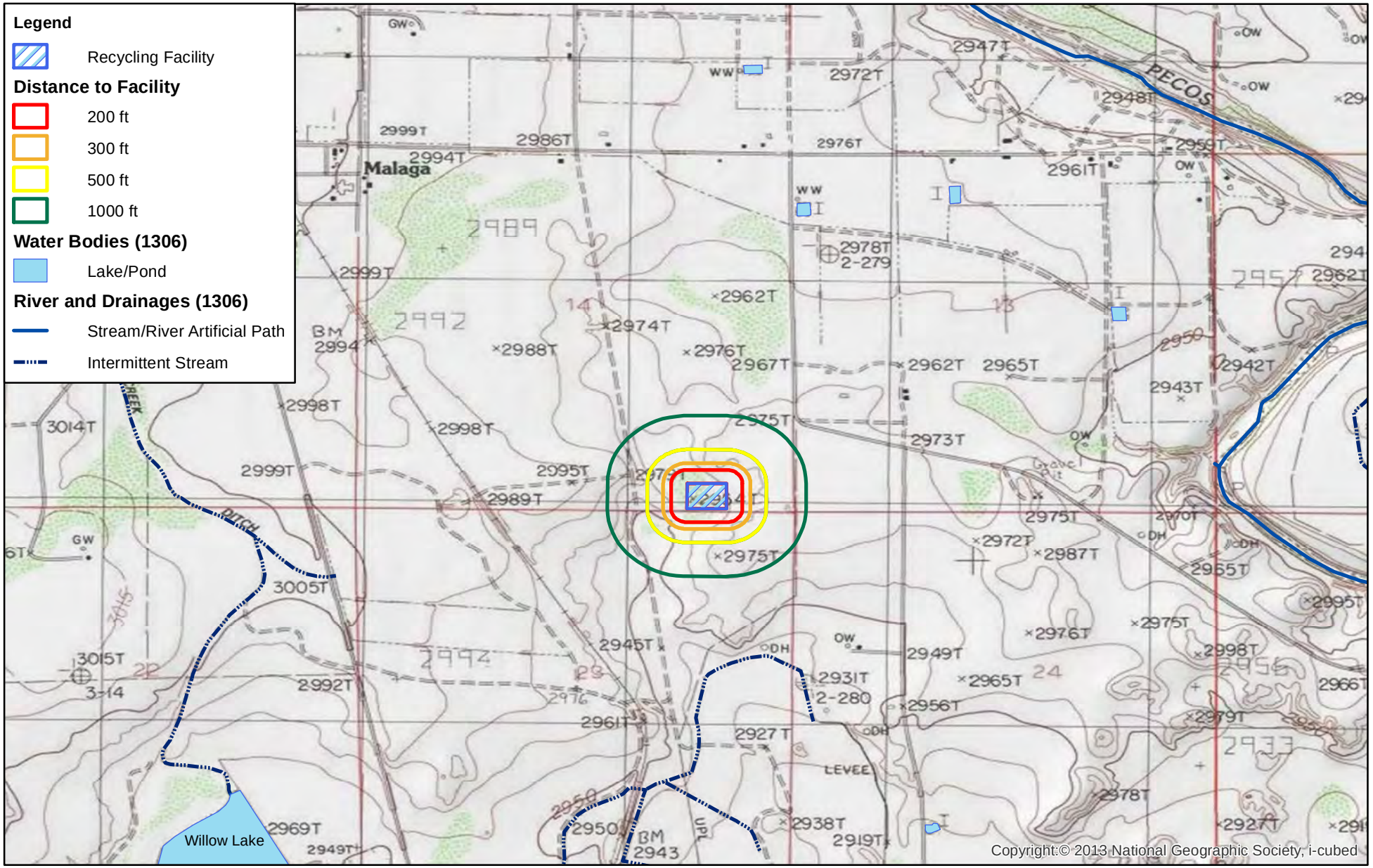
Potentiometric Surface and Groundwater Elevation at Nearby Water Wells

Figure 2

Matador Production Company
Tiger Recycling Facility

May 2016



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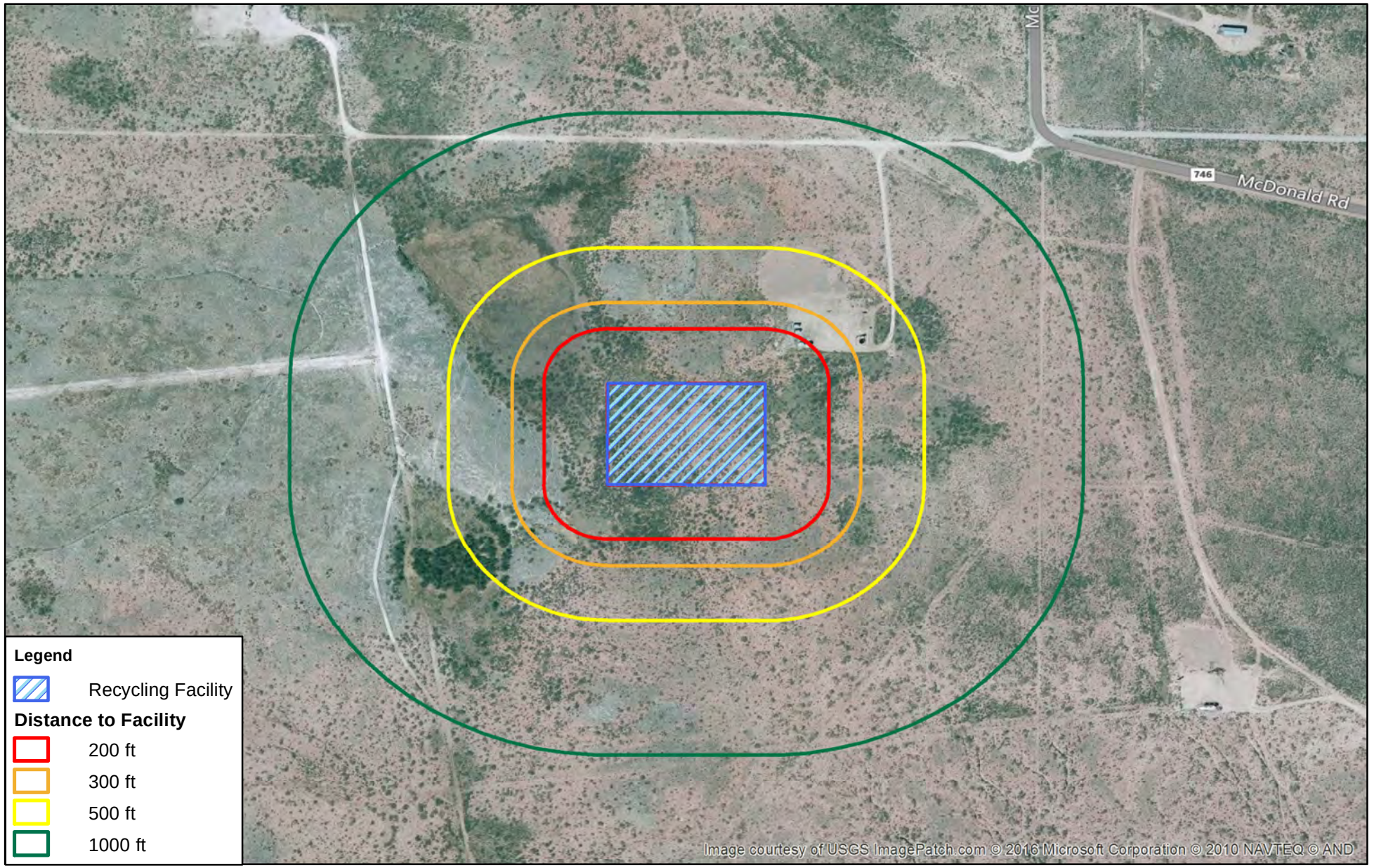
Surface Water and Topography

Figure 3

Matador Production Company
Tiger Recycling Facility

February 2016



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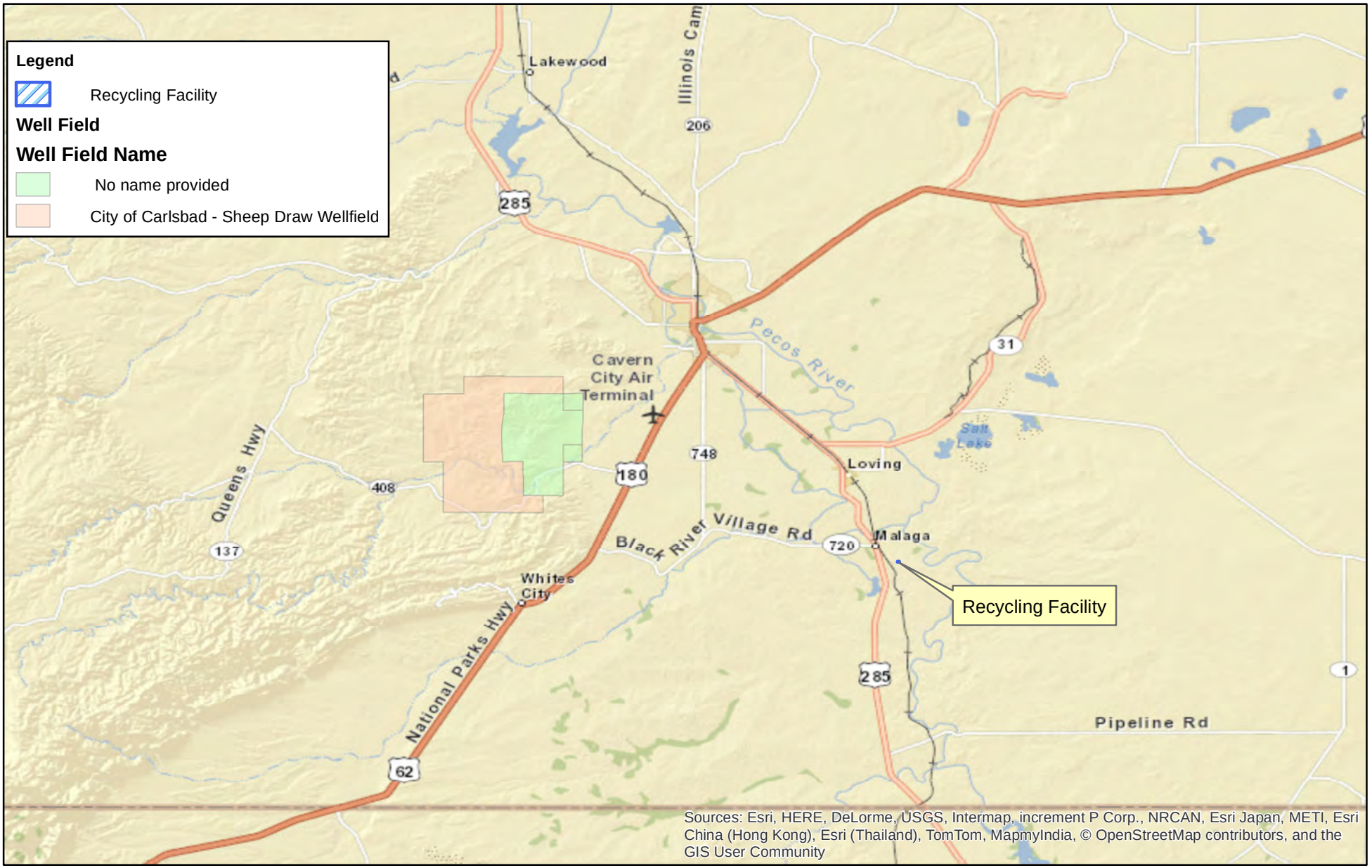
Nearby Structures

Figure 4

Matador Production Company
Tiger Recycling Facility

February 2016



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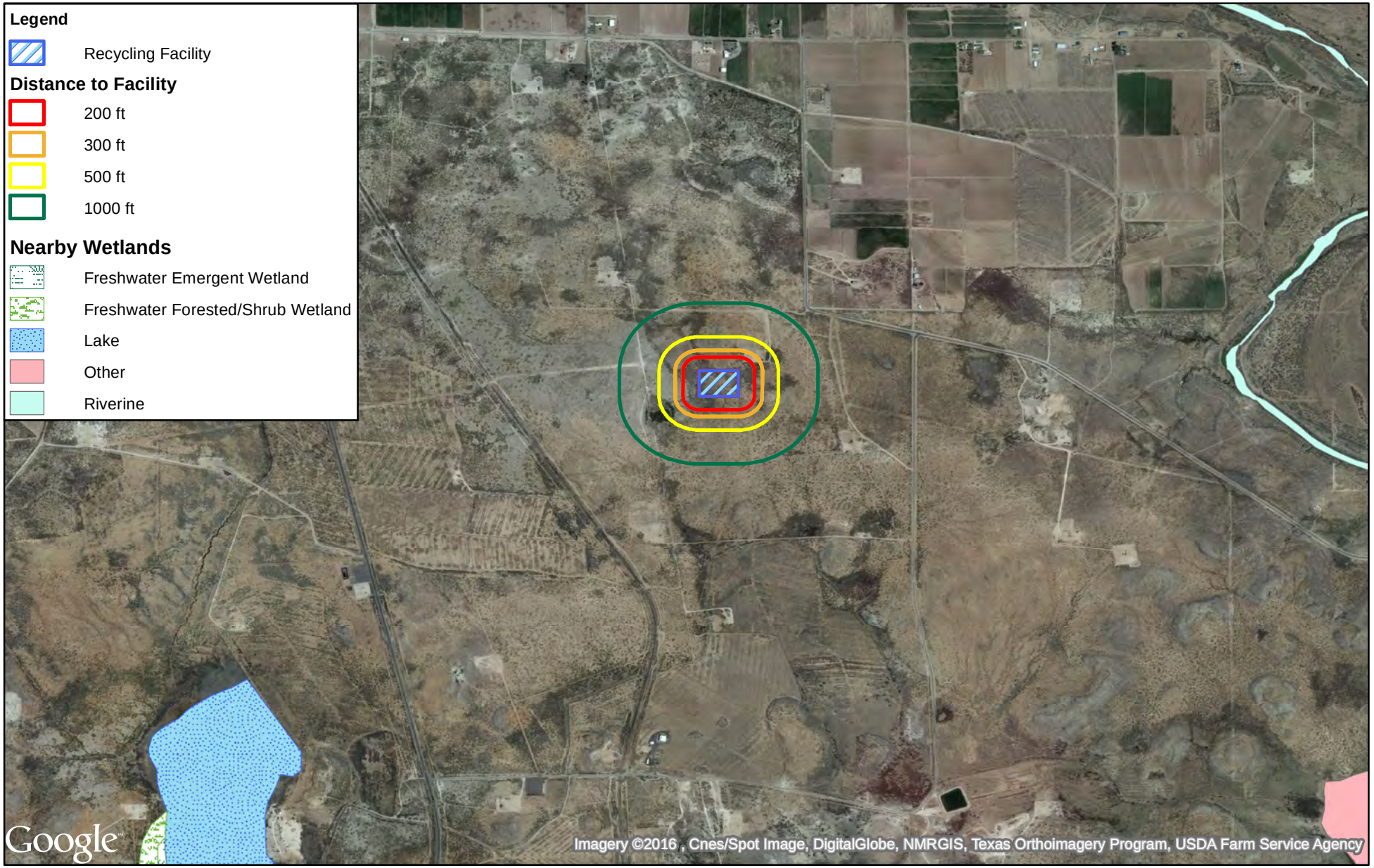
Nearby Municipalities and Well Fields

Figure 5

Matador Production Company
Tiger Recycling Facility

February 2016



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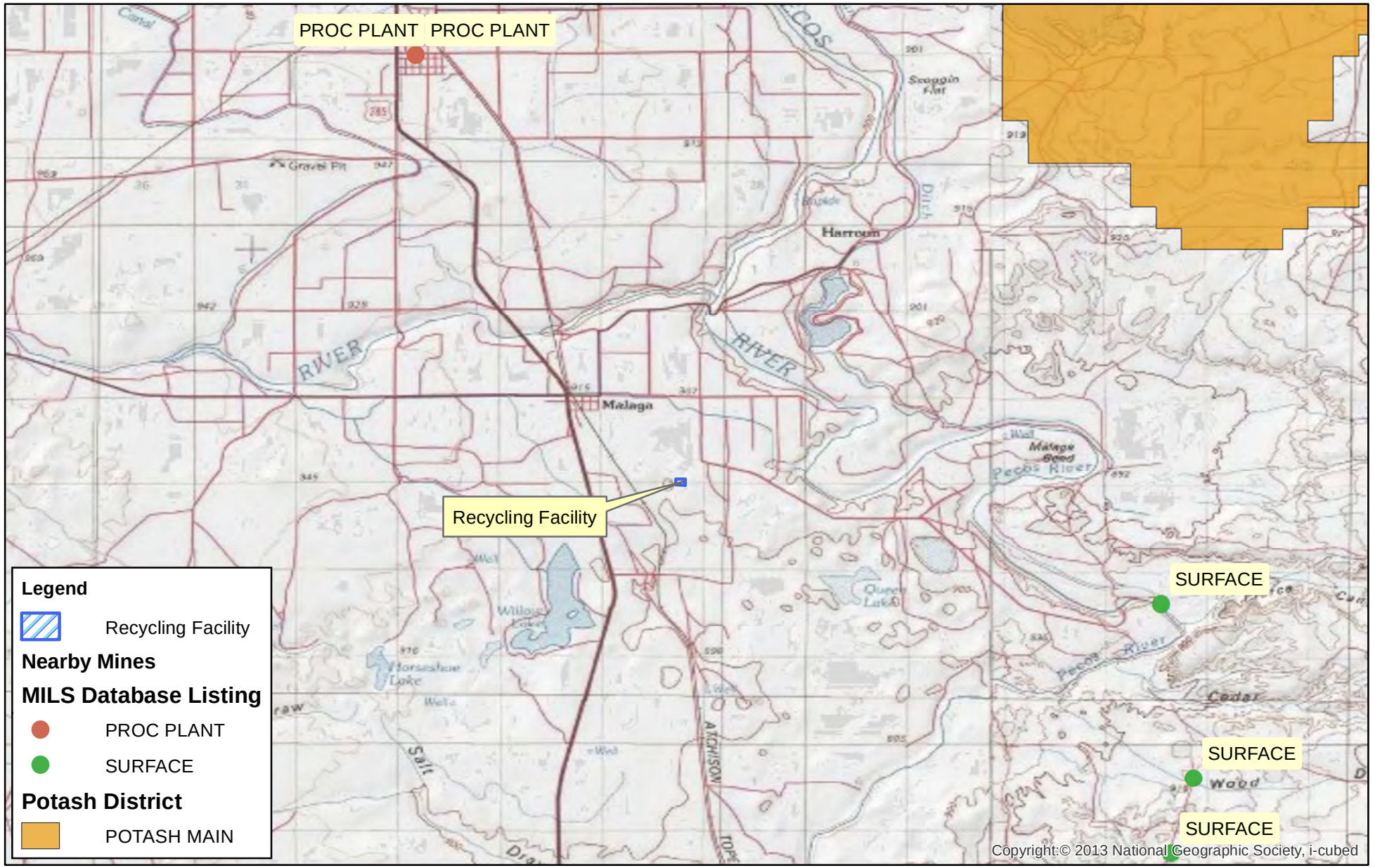
Nearby Wetlands

Figure 6

Matador Production Company
Tiger Recycling Facility

February 2016



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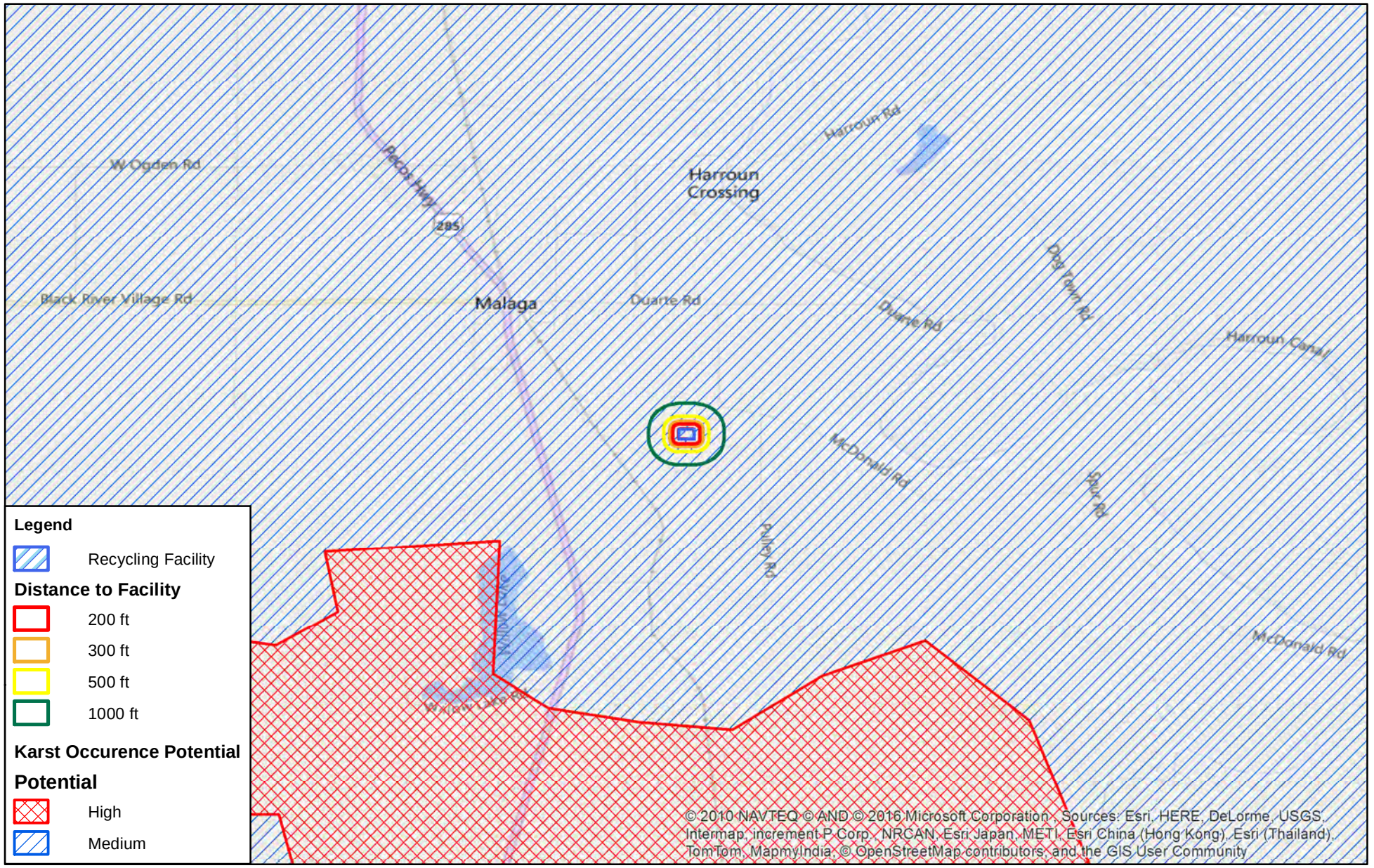
Nearby Mines and Minerals

Figure 7

Matador Production Company
Tiger Recycling Facility

February 2016



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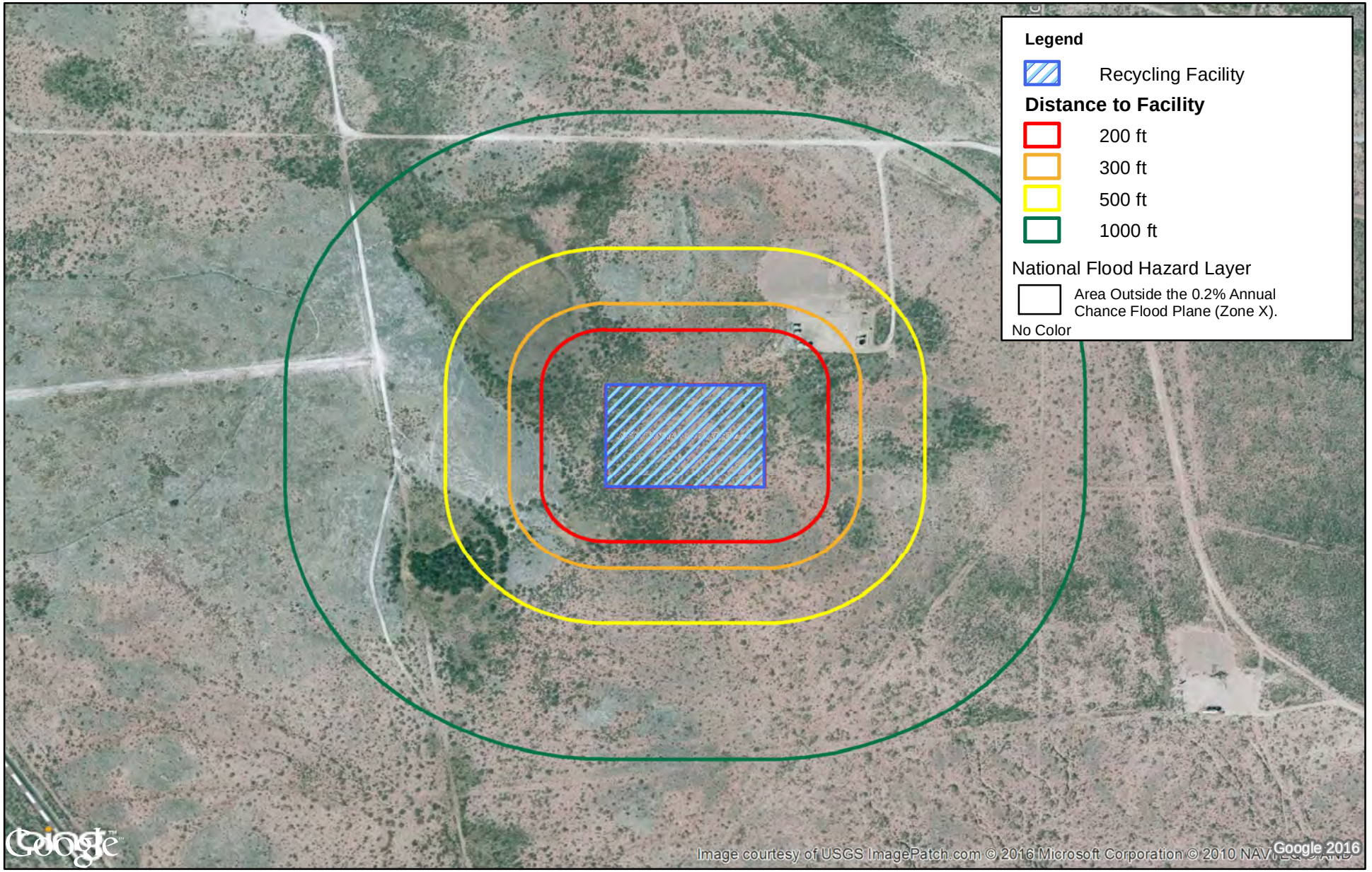
Karst Potential

Figure 8

Matador Production Company
Tiger Recycling Facility

February 2016



FEMA Source: https://hazards.fema.gov/gis/nfhl/services/public/NFHLWMS/MapServer/WMSServer

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FEMA Flood Map

Figure 9

Matador Production Company
Tiger Recycling Facility

February 2016

Variance Request

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.17.16 [emphasis added]:

> **19.15.34.11 SITING REQUIREMENTS FOR RECYCLING CONTAINMENTS:**
> **A.** An operator shall not locate a recycling containment:
> **(1)** where ground water is less than 50 feet below the bottom of the containment;

An on-site auger boring demonstrates that the distance between ground surface at the boring location and groundwater is 51 feet. Due to the sloping ground surface, the size of the proposed AST Containment pad and variations in the ground surface, the most cost-effective elevation of the pad is 4-6 feet lower than the surface elevation of the auger boring. Therefore, the distance between the bottom of the AST Containment and groundwater will be 47-45 feet, not the prescribed 50-foot setback.

As described below, raising the pad elevation to meet the prescribed 50-foot setback would require importation of a significant volume of soil. Such an effort increases the environmental footprint and the financial footprint of this project. Granting this variance will not result in adverse environmental impact and will reduce the footprint of the project.

Demonstration That the Variance Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment

The purpose of the 50-foot setback between the bottom of the containment and groundwater is to provide protection of groundwater quality from undetected leakage. This 50-foot setback, however, does not consider the nature of the earth material that creates this 50-foot buffer. A containment overlying 50-feet of sand meets the setback criteria but provides much less protection of groundwater than the same containment overlying 40 feet of sand and clay – especially the compacted Permian-age clay of the Rustler Formation that underlies the proposed Matador containment.

The attached AMIGO[1] simulations quantify what common sense suggests us: clay provides a much better buffer to protect groundwater quality than a greater than sand. As shown in the Amigo simulation "Sand100", a hypothetical release over a 50-foot unsaturated zone buffer comprised of 100% sand causes a chloride concentration of 163 mg/L at a well that is 50-feet downgradient from the release. Background groundwater chloride concentration is 100 mg/L. The second Amigo simulation ("Sand30") uses the same input data as Sand100 with the exception of the following data:

- Depth to water is 40 feet
- Sand comprises 15 feet of the 40-foot buffer (30% sand)
- Clay comprises 35 feet of the 40-foot buffer

The result of the simulation is a maximum chloride concentration in groundwater of 125 mg/L. Therefore, the impact to groundwater with this 40-foot buffer is 60% less than the impact suggested by 50-foot buffer comprised of 100% sand.

This variance request includes a more robust closure protocol than required by the Rule. This proposed closure protocol and the natural clay that comprises the buffer between the containment and groundwater combine to provide better protection of fresh water, public health and the environment that compliance with the 50-foot setback mandated by the Rule.

[1] http://www.api.org/oil-and-natural-gas/environment/clean-water/surface-water-quality/api-amigo-online-decision-support-tool

The closure sampling proposed as part of this variance is described below:

1. Under each of the 5 containments, a total of 5 discrete surface samples (0-4 inches) will be obtained and evaluated for chloride using field techniques. If any part of the surface is wet, a sample from the wet area will be included in the 5 samples.
2. At the locations exhibiting the two highest field chloride concentrations, additional samples will be obtained at 2.5 and 5.0 feet below grade and evaluated with field chloride techniques.
3. If field analyses suggest the 5-foot sample depth exceeds 250 ppm (or pre-operational background), the trench/hole will be deepened to 10-12 feet with samples every 2.5 feet
4. The sample with the highest field chloride measurement beneath each containment will be submitted to a laboratory for confirmation (5 samples total)
5. Two other samples of lower field concentrations will also be submitted to the laboratory
6. All samples will be reserved for additional analytical work if chloride concentration results suggest a release.

If this robust sampling protocol

a. suggests a release, Matador will submit a C-141 as required by the Rule
b. demonstrates that no release occurred, the containments will be closed pursuant to the plan in the Registration

To confirm that a release has occurred, comparison of the results of the closure sampling to background concentrations is necessary. Matador will collect background samples in the manner described below:

I. Beneath the center of each tank location, during construction of the pad, obtain one sample
   a. 5-feet below the projected surface elevation of the pad
   b. 7.5-feet below the projected surface elevation of the pad
   c. 0-4 inches below the actual surface of the pad (collected during the lay-down of the secondary liner
II. Evaluate all 15 samples for chloride using field techniques
III. Cause an accredited laboratory to use the SPLP Method and EPA protocols for the evaluation of the 5 samples from the 5-foot depth for
   a. Chloride
   b. Sodium
   c. Sulfate
   d. Calcium

The laboratory evaluation of cations and anions may be useful if chloride concentrations observed in the closure sampling suggests an undetected release during operations.

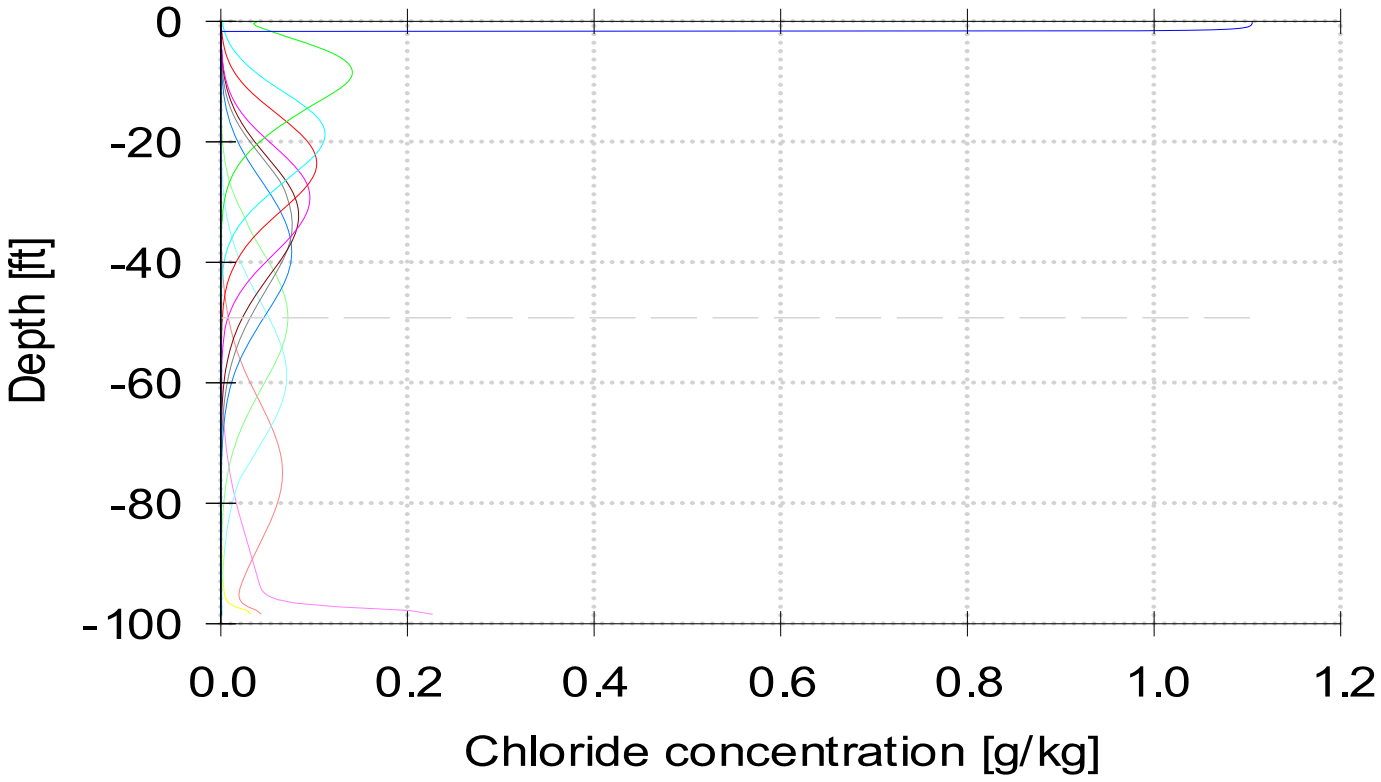
Project: TigerSimulation-Sand100
Path: M:\Matadoor- TigerRecycling\Correspondence\TigerSimulation-Sand100.ami
Date: 6/7/2016
Units: English (inches)
Climate: Arid Hot (NM/W.Texas, Hobbs)
Plant Uptake Trigger: 1% Input Concentration

Groundwater Characteristics
Background Cl Concentration in Aquifer: 100 [mg/L]
Aquifer porosity: 0.3 [-]
Groundwater Table Depth: 50 [ft]
Aquifer Thickness: 20 [ft]
Slope of Water Table: 0.005 [-]
Hydraulic Conductivity: 20 [ft/d]
Groundwater Flux: 2 [ft2/d]

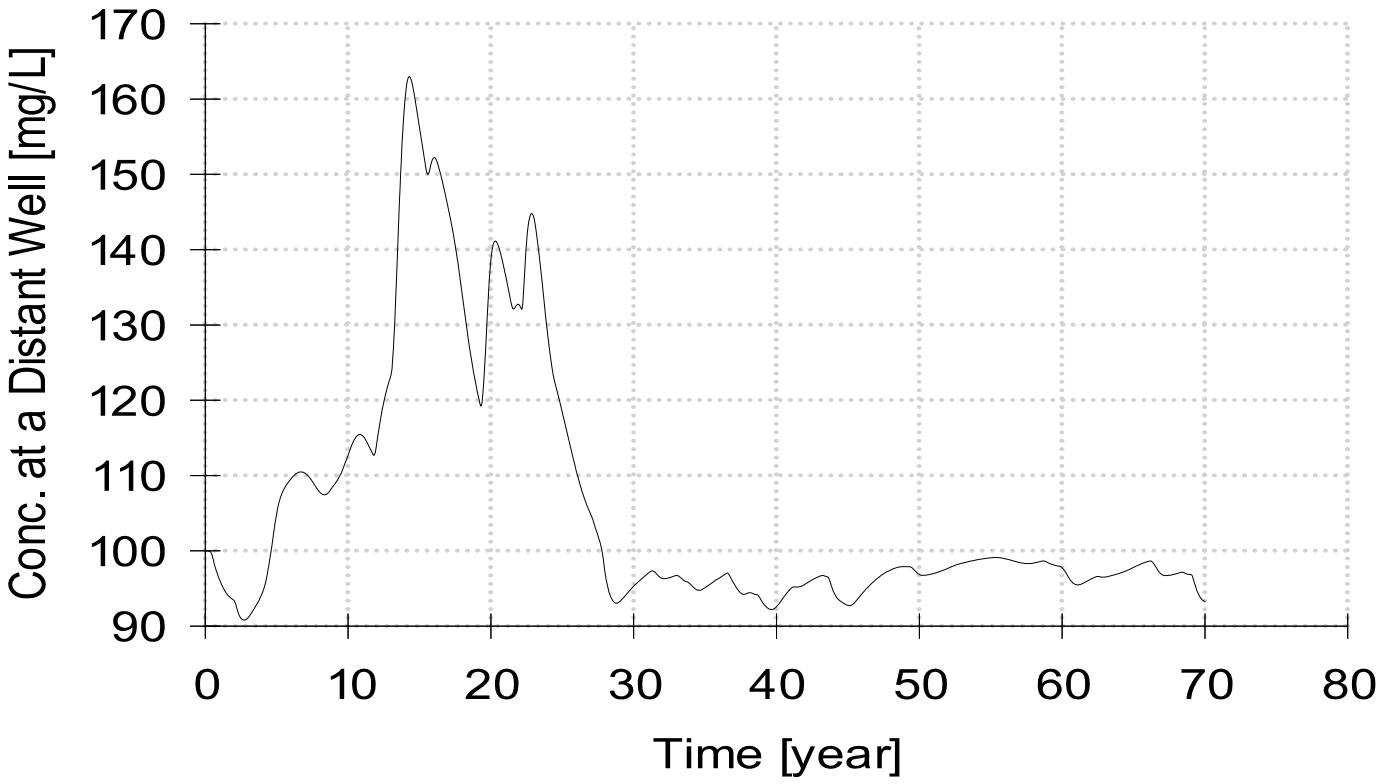
Source Characteristics
Chloride Load:: 1 [kg/m2]
Max. length of the spill in direction of GW flow:: 160 [ft]

Soil Profiles
Surface Layer: Medium Sand
Soil Profile: P1 - Medium Sand (30 m)

Distant Well Parameters
Distance to Well:50[ft]
Source Width:160[ft]
Longitudinal Dispersivity:10[-]
Transverse Dispersivity:1[-]



Max Concentration 163.002 [mg/L] at time 14.288 Year



Project: TigerSimulation-Sand30
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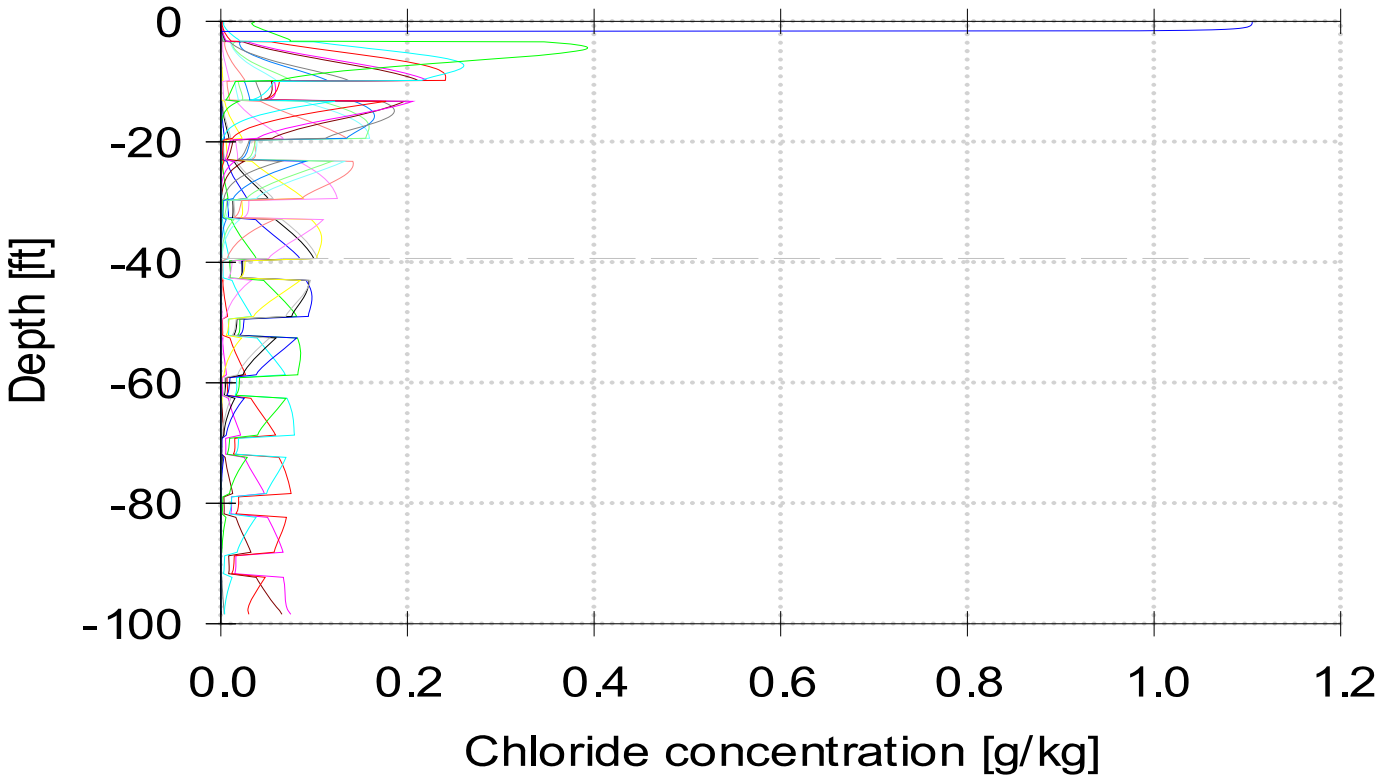
Date: 6/7/2016
Units: English (inches)
Climate: Arid Hot (NM/W.Texas, Hobbs)
Plant Uptake Trigger: 1% Input Concentration

Groundwater Characteristics
Background Cl Concentration in Aquifer: 100 [mg/L]
Aquifer porosity: 0.3 [-]
Groundwater Table Depth: 40 [ft]
Aquifer Thickness: 20 [ft]
Slope of Water Table: 0.005 [-]
Hydraulic Conductivity: 20 [ft/d]
Groundwater Flux: 2 [ft2/d]

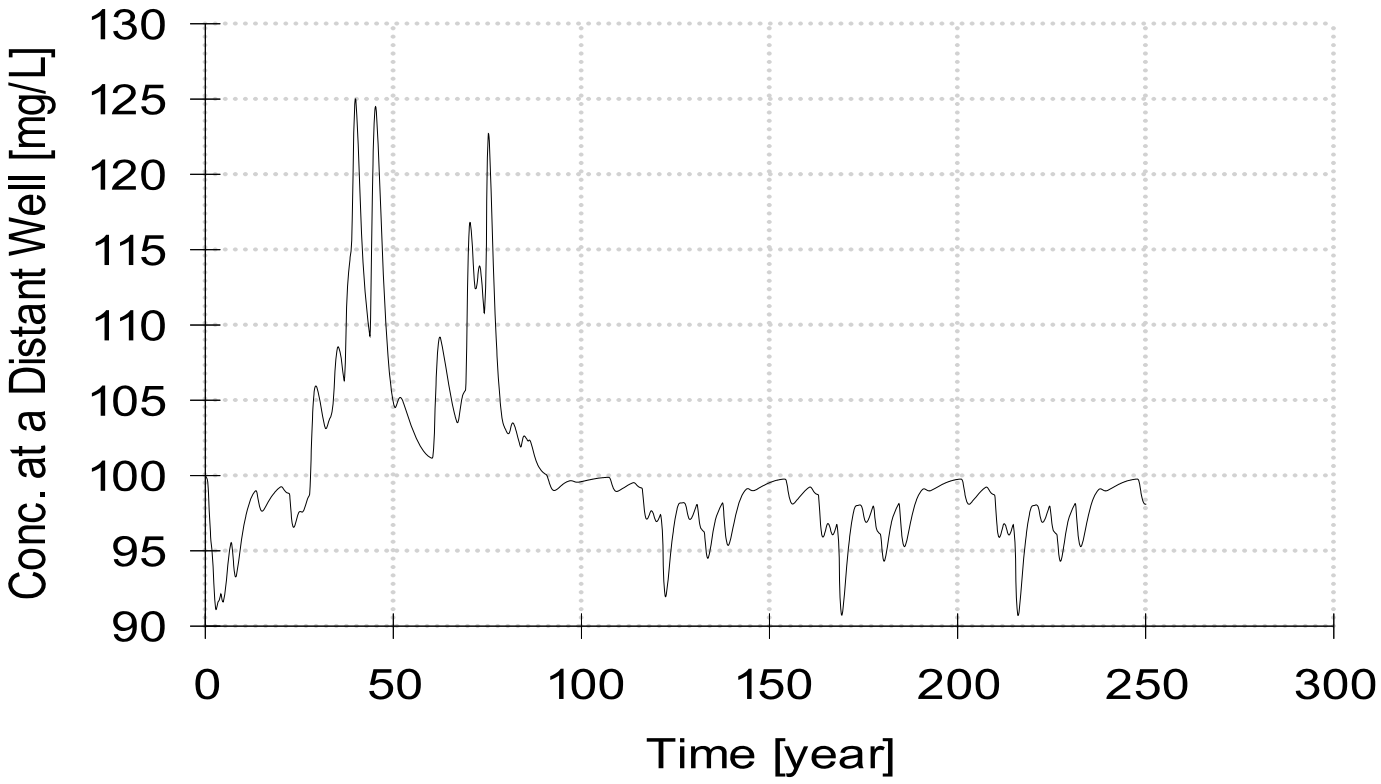
Source Characteristics
Chloride Load:: 1 [kg/m2]
Max. length of the spill in direction of GW flow:: 160 [ft]

Soil Profiles
Surface Layer: Medium Sand
Soil Profile: P6 - Sandy Clay (2) + Medium Sand (1)

Distant Well Parameters
Distance to Well:50[ft]
Source Width:160[ft]
Longitudinal Dispersivity:10[-]
Transverse Dispersivity:1[-]



Max Concentration 125.012 [mg/L] at time 39.910 Year



Appendix A

Site Inspection Photgraphs

View is to the east-southeast from the northwest corner of the containment pad.

This view to the southeast from closed depression shows the location of the stake marking the northwest corner of the pad for the AST containments. No evidence of wetland vegetation lies within this closed depression.

This images shows the nature of vegetation at the southwest corner post of AST pad.

This image shows the northeast corner stake of the pad to hold the ASTs.

Appendix B

Auger Drilling Log

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

Memorandum

From: Kristin Pope

Date: May 12, 2016

RE: Matador Production Company, Tiger Recycling Facility soil boring

The soil boring for the proposed Tiger Recycling Facility has a surface elevation of about 2,956 feet and is located approximately 1.5 miles southeast of the community of Malaga. The uppermost water-bearing zone was expected to be encountered within the Permian Rustler Formation, approximately 50 feet below the location or 2915+/- feet above sea level. To gather the most accurate groundwater data at the site, we installed a soil boring to log the cuttings and determine depth to groundwater. This hole was located approximately 30 feet south of the proposed location pad and approximately 50 feet west of the stake for the southeast corner of the pad.

Breaking surface

On May 10, 2016 I witnessed the drilling of the soil boring, located in south-eastern Eddy County. Butch's Rat Hole & Anchor Service performed the work using a track-mounted AF-125 auger drilling rig as shown in the adjacent photograph. I met Mr. Dee Smith of Matador on site at 10:00 am to locate the hole and gain access for the rig. The auger began drilling at 11:00 am and advanced the hole 2.5 feet of depth per trip. Cuttings were monitored for moisture and lithology with each trip. Samples were collected from intervals with remarkable or representative lithology or moisture. Inspection of the cuttings revealed moist, fine sand to 17 feet. From 17 to 54 feet, clay was encountered with small amounts of gypsum and sandstone to 42 feet. The boring was advanced to a total depth of 54 feet in 2 hours. Moisture was observed in the cuttings from just below the surface to 24 feet. Moisture then increased again at 42 feet. Wet cuttings were returned beginning at 51 feet.

The following lithological descriptions were observed and recorded:

0-17 feet	Sand, red-brown, fine-grained, well-sorted, moist
17-24 feet	Sandy clay, brown-red, <5% gypsum (brown/white, friable), moist
24-38 feet	Clay, brown-red, soft, massive; 3% gypsum (brown, friable), dry
38-42 feet	Clay, light red, 5% sandstone clasts (1-2 in. diameter), dry
42-51 feet	Clay, red, massive, firm, moist
51-54 feet	Clay, red, very sticky, wet

After the last trip out of the hole at 54 feet below surface, we waited approximately 15 minutes and measured depth to water in the hole—**53.17 feet**. At approximately 1:00 pm, the level was measured again for confirmation with the same result. The hole was backfilled with cuttings and the location marked with a lathe and flagging on the surface to record elevation of the surface at the time of construction of the facility.

Kristin Pope

Final trip out of hole at 54feet

June 2016

C-147 Registration Package for Tiger Recycling Containment and Recycling Facility Section 14 T24S R28E, Eddy County

Volume 2
Previously-Approved Variance Requests (2 RF 102-0)
Appendix C Engineering Drawings and Liner Specifications
Appendix D - Design Plan
Appendix E - Master Assembly Manual for AST
Appendix F – Operation Plan
Appendix G - Closure Plan

View northeast from southwest corner of proposed Tiger Recycling Containment.

Prepared for:
Matador Production Company
Dallas, Texas
And
Select Energy Services

Prepared by:

R.T. Hicks Consultants, Ltd.
901 Rio Grande NW
F-142
Albuquerque, New Mexico

Previously-Approved Variances

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Mr. Randall Hicks, PG
R.T. Hicks Consultants Ltd.
901 Rio Grande Boulevard
Suite F-142
Albuquerque, New Mexico 87104

March 31, 2015

RE: Technical Memorandum
LLDPE as Alternative Primary Liner System
Devon Energy / Hackberry Modular Impoundment

Dear Mr. Hicks:

At your request, I have investigated the suitability of application for two 30 mil LLDPE non-reinforced geomembranes as an alternative Primary liner in the Devon Energy /Hackberry Modular Impoundment. I have reviewed your C-147 Supplemental Information Report, Modular Tank Drawing, Design and Construction Plan as well as applicable correspondence. In consideration of the Primary lining system application (modular impoundment), size of the impoundment and depth, design details for modular tanks as well as estimated length of up to two years of service time, it is my professional opinion that two 30 mil LLDPE geomembranes will provide the requisite barrier against processed water loss. The two 30 mil LLDPE liners will function equal to or better than 60 mil HDPE, 30 mil PVC or 45 mil LLDPE as a primary liner system. The following are discussion points that will exhibit the attributes for using two 30 mil LLDPE geomembranes as the primary lining system:

The nature and formulation of LLDPE resin is very similar to HDPE. The major difference is that LLDPE is lower density, lower crystallinity (more flexible and less chemical resistant). However LLDPE will resist aging and degradation and remain intact for many years in exposed conditions. Although the lifetime of LLDPE in covered conditions (i.e., secondary liner) will be somewhat reduced with respect to HDPE, a secondary liner of LLDPE will outlast an exposed HDPE liner. In fact, according to the Geosynthetic Research Institute (GRI) study on lifetime prediction (GRI Paper No. 6), the half life of HDPE (GRI GM 13) exposed is > 36 years and the half-life of LLDPE (GRI GM 17) exposed is approximately 36 years (the Devon Energy Modular Impoundment life span is expected to be only 2 years maximum). It is understood that in order to ensure compliance of materials, 60 mil HDPE must meet or exceed GRI GM 13. Likewise, the primary or secondary liner must meet or exceed GRI GM 17 for non-reinforced LLDPE. Adhering to the minimum requirements of the GRI Specifications, two 30 mil LLDPE geomembranes when used as a primary liner system in the Devon Modular Impoundment will be equally as protective as a 60 mil HDPE liner.

Flexibility Requirements. 30 mil LLDPE geomembranes are less stiff and far more flexible than HDPE or 45 mil reinforced LLDPE and in this regard are preferred for installations in vertical wall tanks such as the Devon Modular Impoundment. LLDPE

provides a very flexible sheet that enables it to be fabricated into large panels, folded for shipping and installed on vertical walls transitioned to flat bottom. LLDPE will conform to the tank dimensions under hydrostatic loading.

Thermal Fusion Seaming Requirements. Thermal seaming and QC seam test requirements for geomembranes are product specific and usually prescribed by the sheet manufacturer. Both dual wedge and single wedge thermal fusion welding is commonly used on LLDPE and QC testing by air channel (ASTM D 5820) or High Pressure Air Lance (ASTM D 4437) is fully acceptable and recognized as industry standards. In this regard, there should be no exception or recommended practice for seaming and QC testing in the OCD rules. This would be fully covered in comprehensive specifications for both the Primary and Secondary geomembranes that would be reviewed by OCD.

Potential for Leakage through the Primary Liners. Leakage through geomembrane liners is directly a function of the height of liquid head above any hole or imperfection. The drainage media provides immediate drainage to a low point or outside the Modular Impoundment and thus no hydrostatic head or driving gradient is available to push leakage water through a hole. In this regard, secondary geomembrane materials can be (and usually are) much less robust in both thickness and polymer type.

Leakage through any Primary geomembrane is driven by size of hole and depth and will be detected by the increase of waste water in the drainage system and the volume being pumped out of the secondary containment. In this regard and for this variance, the Primary consists of 2 layers of 30 mil LLDPE geomembrane which will out perform a single layer of HDPE or LLDPE for potential leakage. Thus, if a leak occurs through the top layer, it will be effectively contained by the second layer. If required, location of holes in the Primary can be found by Electrical Leak Location Survey (ELLS) using a towed electrode (ASTM D 7007). Holes found can then be repaired and thus water seepage into the Secondary will be kept to a minimum. Dependent on OCR requirements for Action Leakage Rate (ALR), the leakage volumes may only be monitored. For example, a typical ALR is < 20 gpad whereas a rapid and large leak (RLL) may be > 100 gpad. Most states specify maximum ALR values for waste water impoundments usually in the range of 100 to 500 gpad. However, New Mexico does not specify any ALR for waste water impoundments (GRI Paper No. 15).

HDPE can not be prefabricated into large panels and thus 30 mil LLDPE offers the following for Primary Liner Modular Containment:

- Prefabrication in factory controlled conditions into very large panels (up to 35,000 sf) results in ease of installation, less or no thermal fusion field seams and less on site QC and CQA.

- Large prefabricated panels of 30 mil LLDPE will provide better control of thermal fusion welding in a factory environment that will improve the liner system integrity for the long term.

- The LLDPE geomembrane provides superior flexibility, lay flat characteristics and conformability which allows for more intimate contact with the underlying drainage media and tank walls.

- Two layers of the 30 mil LLDPE provide redundancy. Additionally, the bottom layer provides protection for the top layer during installation as well reduction in leakage due to pinholes (no driving head on the second 30 mil liner)

- Ease of installation of large prefabricated custom size panels results in a greater reduction of installation time and associated installation and QC costs.

- The LLDPE geomembrane is easily repaired using the same thermal fusion bonding method without the need for special surface grinding/preparation for extrusion welding used in repair of HDPE geomembranes.

In summary, it is my professional opinion that the double 30 mil LLDPE geomembranes will provide a Primary liner system that is equal to or better than a single 60 mil HDPE, 30 mil PVC or 45 mil reinforced LLDPE liner and will provide the requisite protection of fresh water, public health and the environment for many years and especially for the estimated two year life of the Devon Energy / Hackberry Modular Impoundment.

If you have any questions on the above technical memorandum or require further information, give me a call at 303-679-0285 or email geosynthetics@msn.com

Sincerely Yours,

R K Frobel

Ronald K. Frobel, MSCE, PE

References:

C-147 Supplemental Information
Devon Energy Modular Impoundment
Prepared by Hicks Consultants and Rockwater Energy Solutions

Title 19, Chapter 15, Part 34 NMAC (2015 Revision)

Geosynthetic Research Institute (GRI) Published Standards and Papers 2013

ASTM Standards 2013

Attachments:

R. K. Frobel C. V.

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Mr. Randall Hicks, PG
R.T. Hicks Consultants Ltd.
901 Rio Grande Boulevard
Suite F-142
Albuquerque, New Mexico 87104

March 31, 2015

RE: Technical Memorandum
Slopes and Anchor Trench Variance
NMAC 19.15.34.12.A(2) & (3)
Devon Energy / Hackberry Modular Impoundment

Dear Mr. Hicks:

At your request, I have reviewed the suitability of application of two 30 mil LLDPE geomembranes as an alternative Primary liner system for the Devon Energy / Hackberry Modular Impoundment. In consideration of liners in traditional pits, the NMOCD rules require a maximum 2H:1V slope and anchorage at the top of slope in soil backfill anchor trench. I have also reviewed your C-147 Supplemental Information Report, Modular Tank Drawing, Design and Construction Plan as well as applicable correspondence. In consideration of the LLDPE Primary lining system application (Modular Impoundment), size of impoundments and depth, design details for modular tanks as well as the fact that this is an above ground storage tank (not constructed in an excavated or raised embankment pit), it is my professional opinion that the LLDPE geomembranes will provide the requisite barrier against potential produced water loss and will function within the vertical walls of the Modular Impoundment the same as or better than an in-ground pit with slopes. The following are discussion points that will exhibit the positive attributes of a Modular Impoundment System:

Side Slope

The design of soil side slope (inclination) is a geotechnical engineering design consideration. Liquid impoundments such as fresh water or process water containments are usually built within an excavation or with raised earthen embankments. For a liquid impoundment with an exposed liner system, the slope soils and construction dictate slope inclination and very detailed slope stability analysis may be required to determine if slope failure within the embankment will occur once loaded with impounded water. Slope failure may also occur during construction or when the impoundment is empty. A maximum slope is usually specified and is dependent on soil type and cohesive strength, saturated or unsaturated conditions, etc. Detailed analysis for slope stability can be found in “Designing with Geosynthetics” by R.M Koerner as well as many geotechnical books.

A modular impoundment, on the other hand, consists of a professionally designed steel tank ring with vertical walls. There is no slope to consider as the segmental steel sections are set vertically. Design of steel tanks as regards hydrostatic loading, wind loading,

seismic loads, etc. are thoroughly referenced with detailed procedures in the design code - American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage". There are no requirements for maximum slope inclination other than perhaps 90 degrees or vertical wall.

Anchor Trench

All earthen impoundments with a geomembrane lining system require some form of top of slope anchor, the most common of which is an excavated and backfilled anchor trench usually set back at least 3 ft from the top of slope. Again, there are detailed procedures for anchor trench design in "Designing with Geosynthetics" by R.M Koerner.

A Modular Impoundment requires mechanical anchoring of the geomembrane at the top of the vertical steel wall using standard liner clips that prevent the geomembrane or geomembrane layers from slipping down the side wall. There are no requirements for an "anchor trench" as this is not an in-ground impoundment.

In summary, it is my professional opinion that two 30 mil LLDPE geomembranes installed within the vertical walls of a Modular Impoundment will provide the requisite protection of fresh water, public health and the environment for many years and especially for the estimated two year life of the Devon Energy / Hackberry Modular Impoundment. In particular, there is no requirement for a maximum interior slope angle of 2H:1V due to the fact that this impoundment is a steel tank with vertical walls. Additionally, there is no requirement for an anchor trench as the geomembrane is attached to the top of the Modular Impoundment vertical walls with large steel clips.

If you have any questions on the above technical memorandum or require further information, give me a call at 303-679-0285 or email geosynthetics@msn.com

Sincerely Yours,

R K Frobel

Ronald K. Frobel, MSCE, PE

References:

C-147 Supplemental Information
Devon Energy / Hackberry Modular Impoundment Design and Construction Plan
Prepared by R. T. Hicks Consultants Ltd.

NMOCD Recycling Rule, Title 19, Chapter 15 – Produced Water, Drilling Fluids and Liquid Oil Field Waste – Section 19.15 Part 34 (2015)

American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage"

Koerner, R.M., 2005 "Designing With Geosynthetics" Prentice Hall Publishers

Attachments:

R. K. Frobel C.V.

Freeboard [NMAC 19.15.17.F(3)]

Statement Explaining Why the Applicant Seeks a Variance

The prescriptive mandates of the Rule that are the subject of this variance request are the following subsections of 19.15.17.11.F:

> **F.** Multi-well fluid management pits. An operator shall maintain and operate a multi-well fluid management pit in accordance with the following additional requirements.
> **(3)** The operator shall maintain at least three feet of freeboard for the pit.

With respect to lined earthen impoundments that may hold 25 acre feet of produced water, a 3-foot freeboard stipulation makes sense. For example, wave action and other factors could focus stress on the upper portion of the levee or the liner system in these large impoundments. The fully netted, 158-foot diameter steel tank (modular impoundment) does not share the same characteristics as these large earthen pits and we believe 3-feet of freeboard is not necessary. Moreover, meeting the 3-foot freeboard requirement significantly reduces the storage capacity of a single modular impoundment – negatively impacting the economics of using produced water in lieu of fresh water for E&P activities.

Demonstration That the Variance Will Provide Equal or Better Protection of Fresh Water, Public Health and the Environment

The attached letter from Mr. Frobel describes how the proposed 2-foot freeboard limit in the permit application for the modular impoundment provides the same protection afforded by the 3-foot freeboard mandate for a large earthen pit. The attached equations and supporting email from Mr. Jason Henderson, PE, shows that a 2-foot freeboard limit on the steel impoundment meets the manufacturer's design criteria.

R.K. FROBEL & ASSOCIATES
Consulting Engineers

Mr. Randall Hicks, PG
R.T. Hicks Consultants Ltd.
901 Rio Grande Boulevard
Suite F-142
Albuquerque, New Mexico 87104

November 20, 2014

RE: Technical Memorandum
Freeboard Variance
NMAC 19.15.17.F(3)
Devon Energy MWFM Modular Impoundment

Dear Mr. Hicks:

At your request, I have reviewed the suitability of application of 40 mil LLDPE geomembrane as an alternative Primary and Secondary liner for the Devon Energy Multi-Well Fluid Management (MWFM) Modular Impoundment. In consideration of liners in traditional pits, the NMOCD rules require a freeboard of at least 3.0 ft. I have also reviewed your C-144 Supplemental Information Report, Modular Tank Drawing, Design and Siting characteristics as well as applicable correspondence. In consideration of the LLDPE Primary and Secondary lining system application (Modular Impoundment), size of impoundments and depth, design details for modular tanks as well as the fact that this is an above ground storage tank (not constructed in an excavated or raised embankment pit), it is my professional opinion that the 40 mil LLDPE geomembranes will provide the requisite barrier against potential processed water loss and will function within the vertical walls of the Modular Impoundment with a 2.0 ft freeboard the same as or better than an in-ground pit with slopes and a 3.0 ft freeboard requirement. The following are discussion points a Modular Impoundment System:

Freeboard Requirements

Liquid impoundments such as fresh water or process water containments are usually built within an excavation or with raised earthen embankments. For a liquid impoundment with an exposed liner system, the slope soils and construction dictate slope inclination and very detailed slope stability analysis may be required to determine if slope failure within the embankment will occur once loaded with impounded water. Freeboard or the vertical height between the maximum water surface elevation and the top of slope is important for earthen impoundments. Specified freeboard requirements take into consideration high precipitation events and prevent wave run-up on slopes that result in over-topping and potential saturation of embankments. This is particularly important on large earthen impoundments. Detailed design considerations including freeboard requirements for lined earthen impoundments can be found in “Designing with Geosynthetics” by R.M Koerner as well as other publications on reservoir design.

A modular impoundment, on the other hand, consists of a professionally designed steel tank ring with vertical walls. There is no slope to consider as the segmental steel sections are set vertical. Design of steel tanks as regards hydrostatic loading, wind loading, seismic loads, etc. are thoroughly referenced with detailed procedures in the design code - American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage". There are requirements for operational freeboard to prevent over-topping but due to the relatively small surface area and fetch of cylindrical tanks, wave heights are much less than large earthen impoundments. Thus freeboard is usually within the range of 0.5 to 2 ft. I have reviewed the Tank Design Calculation Summary and as regards the structural stability of the tank walls, a freeboard of 0.5 ft was assumed. Thus the variance request of 2.0 ft for a Modular Impoundment is well within the Tank Design requirements.

In summary, it is my professional opinion that two 40 mil LLDPE geomembranes installed within the vertical walls of a Modular Impoundment will provide the requisite protection of fresh water, public health and the environment for many years and especially for the estimated two year life of the Devon Energy MWFM Modular Impoundment. In particular, the design freeboard of 2.0 ft will provide requisite storage volume and prevent overtopping due to wind and wave action, potential seismic events and high precipitation.

If you have any questions on the above technical memorandum or require further information, give me a call at 303-679-0285 or email geosynthetics@msn.com

Sincerely Yours,

R K Frobel

Ronald K. Frobel, MSCE, PE

References:

C-144 Supplemental Information
Devon Energy Modular Impoundment
Prepared by R. T. Hicks Consultants Ltd.

NMOCD Recycling Rule, Title 19, Chapter 15 – Produced Water, Drilling Fluids and Liquid Waste 2014 – Section 19.15

American Petroleum Institute (API) 650-98 "Welded Steel Tanks for Oil Storage"

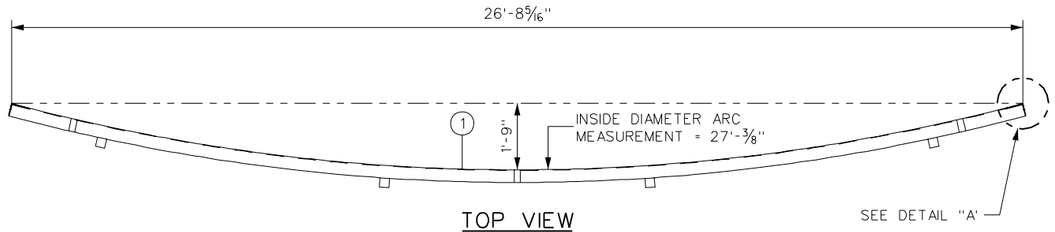
Koerner, R.M., 2005 "Designing With Geosynthetics" Prentice Hall Publishers

Attachments:

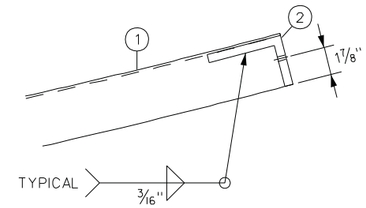
R. K. Frobel C.V.

Appendix C

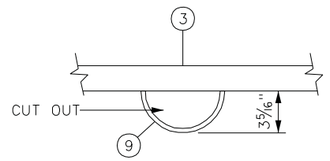
Certified Engineering Drawings
Liner and Geotextile Specifications



TOP VIEW
(SCALE: 1/4" = 1'-0")



DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



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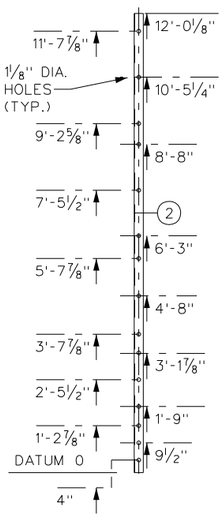
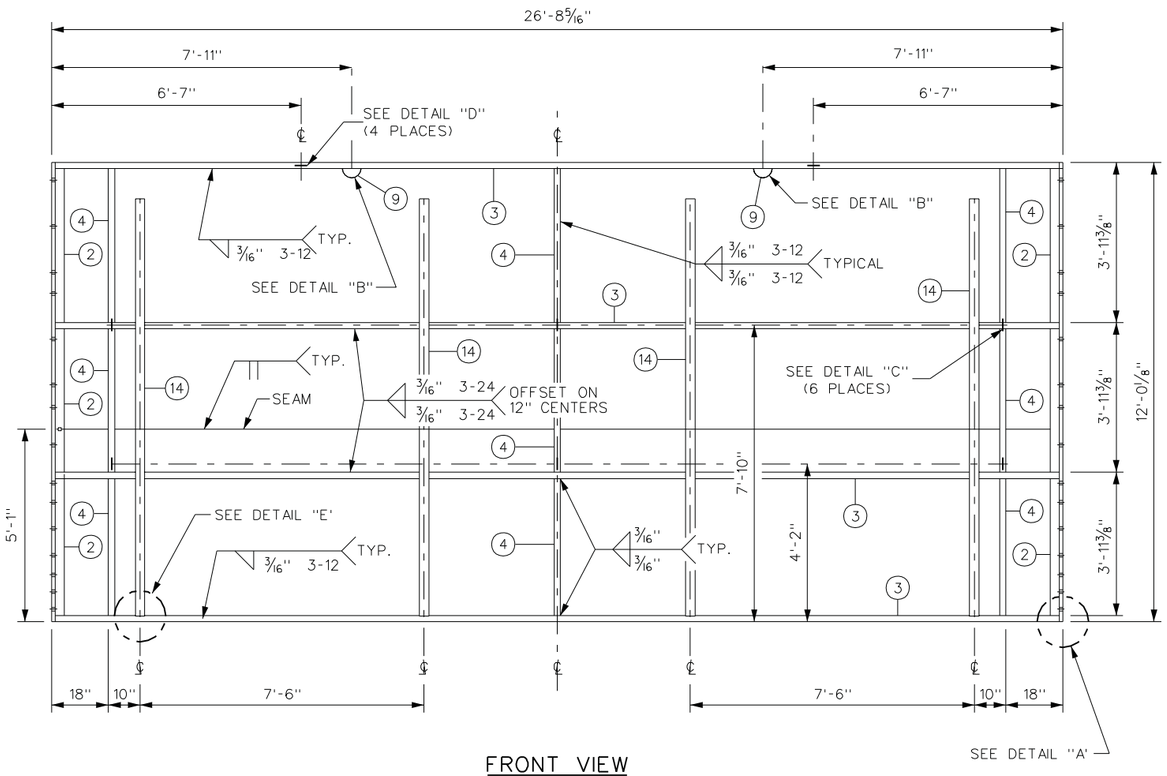
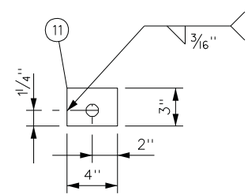
(SCALE: 1" = 1'-0")

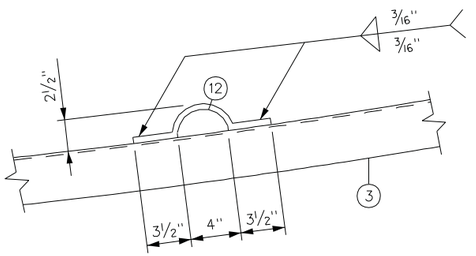




FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")

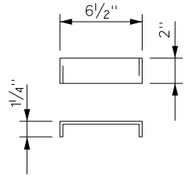


DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")

DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 26'-11 7/8" ROLLED EW TO 103'-1 9/32"	A-36
2	2	4"x6" ANGLE x 3/4" x 12'-0"	44W
3	4	2"x4"x 1/4" HSS x 26'-11 7/8" ROLLED HW TO 103'-1 31/32"	A-500
4	9	2"x4"x 1/4" RECT. TUBE x 3'-9 3/16"	A-500
5			
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10			
11	4	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE, 2"x6 1/2"	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
12 PANELS REQUIRED PER TANK.

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RBC	121002	
B	REVISED PER COMMENTS	ASC	130315	
C	REVISED PER COMMENTS	ASC	130603	
D	REVISED PER COMMENTS	RJB	130813	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED PROFESSIONAL ENGINEER
02-23-2015

Tuxtla GAS ENGINEERING LTD.

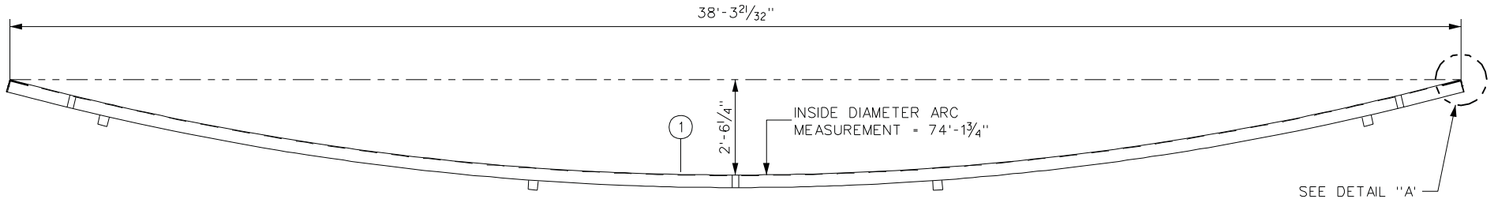
DRAWN	RBC	DATE	121002
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

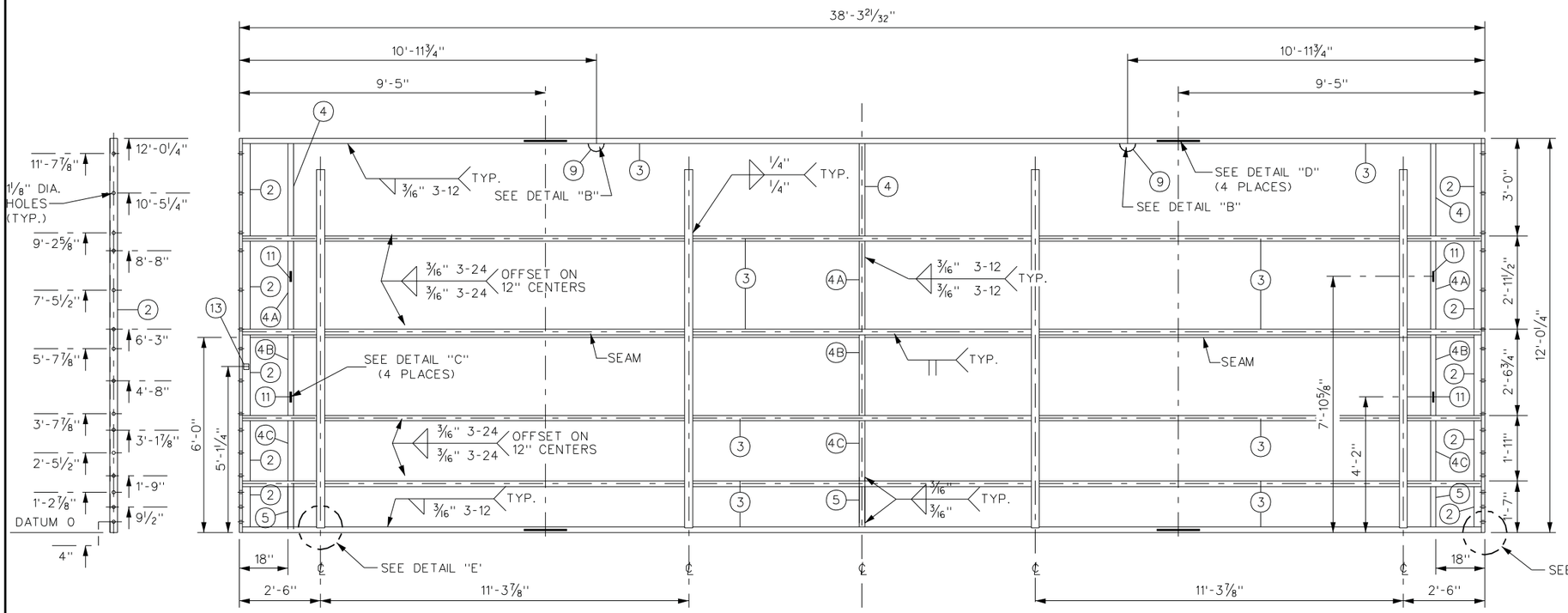
750,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-202	D

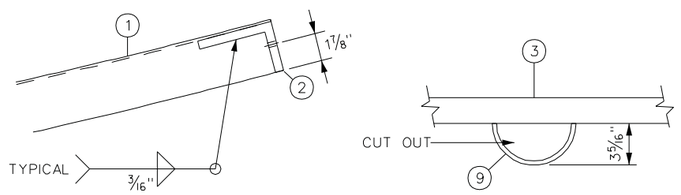
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-202.DGN



TOP VIEW
(SCALE: 1/4" = 1'-0")

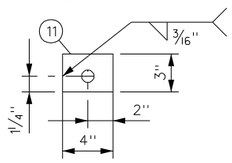


FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")

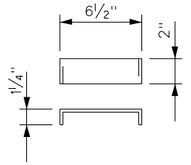


DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")

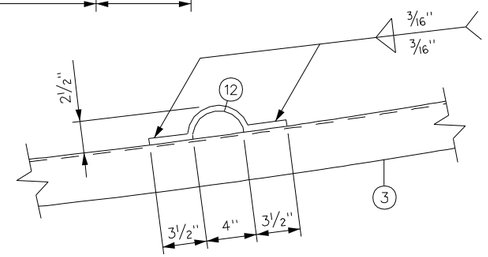
DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")



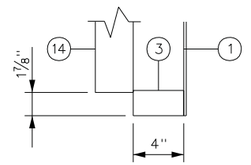
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 38'-7 1/2" ROLLED EW TO 148'-0 11/64"	A-36
2	2	4"x6" ANGLE x 3/4" x 12'-0"	44W
3	6	2"x4"x 1/4" HSS x 38'-8 7/8" ROLLED HW TO 148'-0 11/64"	A-500
4	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4A	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4B	3	2"x4"x 1/4" RECT. TUBE x 2'-4 3/8"	A-500
4C	3	2"x4"x 1/4" RECT. TUBE x 1'- 8 7/8"	A-500
5	3	2"x4"x 1/4" RECT. TUBE x 1'-2 7/8"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10			
11	4	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE, 2"-6 1/2" LONG	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
12 PANELS REQUIRED PER TANK.

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	ASC	121205	
B	REVISED PER COMMENTS	ASC	130315	
C	REVISED PER COMMENTS	ASC	130603	
D	REVISED PER COMMENTS	RJB	130813	
E	REVISED INSIDE DIAMETER ARC	RJB	130826	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED
PROFESSIONAL ENGINEER
02-23-2015

TUXTLA GAS ENGINEERING LTD.

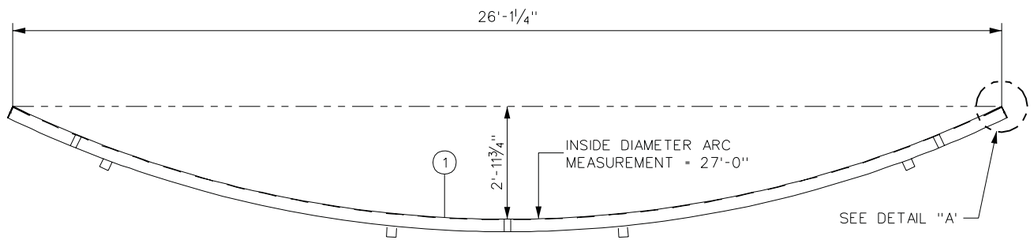
DRAWN	ASC	DATE	121205
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

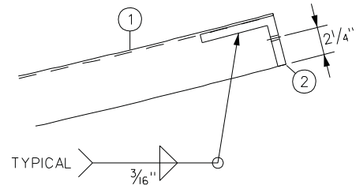
1,500,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-206	E

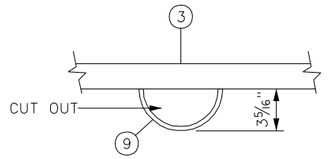
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-206.DGN



TOP VIEW
(SCALE: ¼" = 1'-0")



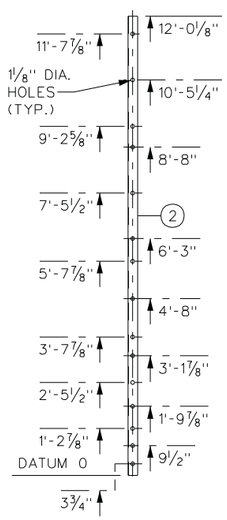
DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")

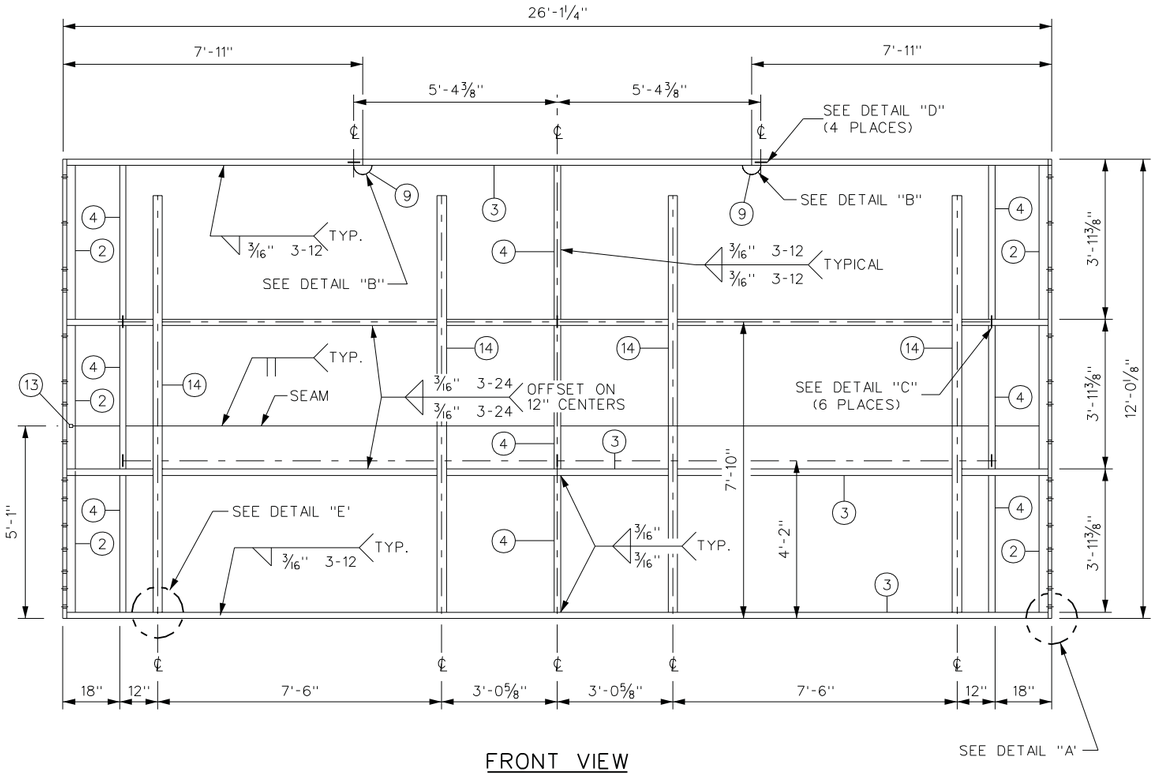


DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")

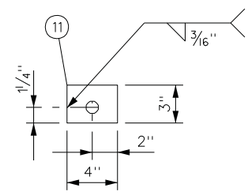
BILL OF MATERIALS			
ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 26'-11 7/8" ROLLED EW TO 30'-61/64" RADIUS	A-36
2	2	4"x6" ANGLE x ½" x 12'-0"	44W
3	6	2"x4"x ¼" HSS x 26'-11 3/8" ROLLED HW TO 30'-61/64" RADIUS	A-500
4	6	2"x4"x ¼" RECT. TUBE x 3'-9 3/16"	A-500
5			
6	15	1" - 8 STRUCTURAL BOLT x 4¼"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3¾" (CUT IN HALF)	A-53B
10			
11	6	½"x4"x 2½" PLATE	A-36
12	4	¾" x ¾" FLAT BAR	A-36
13	1	NAMEPLATE BRACKET ⅛" PLATE	A-36
14	4	3"x3"x ⅛" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
7 PANELS REQUIRED PER TANK.



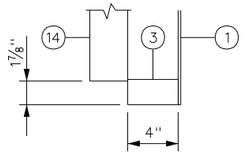


FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: ¼" = 1'-0")

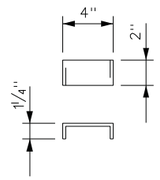


DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")

DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")

GENERAL NOTES	REFERENCE DRAWINGS		REVISIONS				
WEIGHT (PER PANEL):	NUMBER	TITLE	NO.	DESCRIPTION	BY	DATE:	CHK.
			A	ISSUED FOR APPROVAL	ASC	130517	
			B	REVISED PER COMMENTS	RJB	130813	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED PROFESSIONAL ENGINEER
02-23-2015

Tuxtla GAS ENGINEERING LTD.

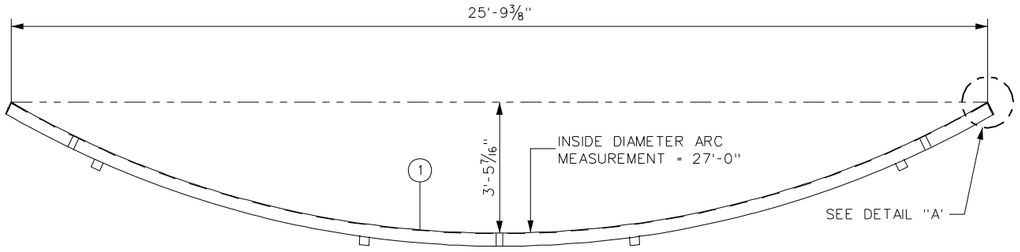
DRAWN	ASC	DATE	130517
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

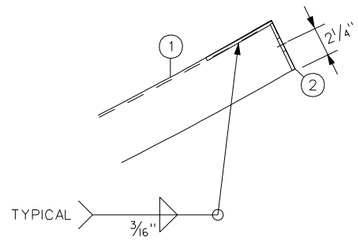
255,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-209	B

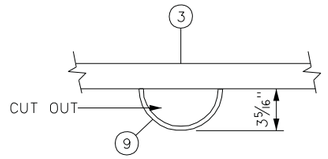
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-209.DGN



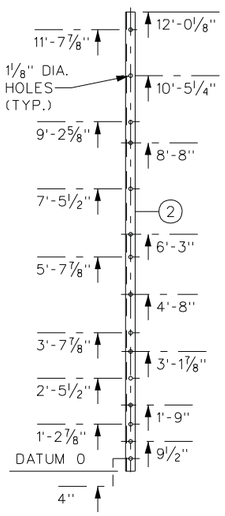
TOP VIEW
(SCALE: 1/4" = 1'-0")

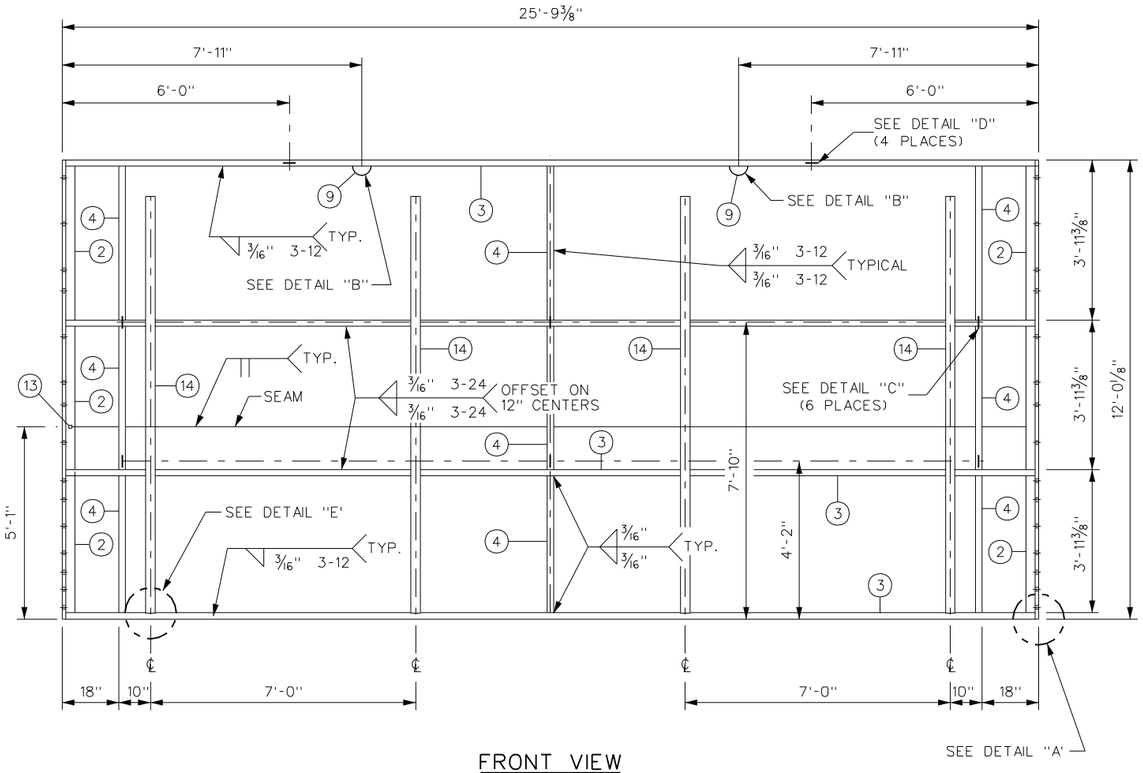


DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")

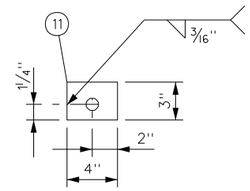


DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")

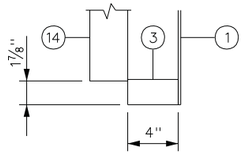




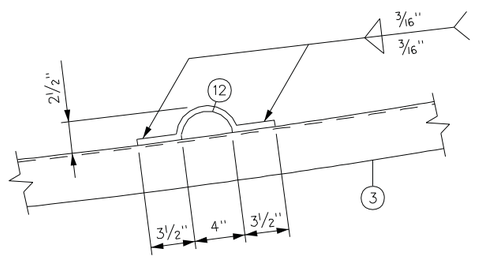
FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")



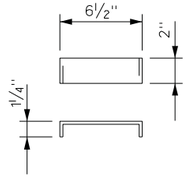
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 27'-0" ROLLED EW TO 25'-9 3/8" RADIUS	A-36
2	2	4"x6" ANGLE x 1/2" x 12'-0"	44W
3	4	2"x4"x 1/4" HSS x 26'-11 7/8" ROLLED HW TO 25'-9 3/16" RADIUS	A-500
4	9	2"x4"x 1/4" RECT. TUBE x 3'-9 3/16"	A-500
5			
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10			
11	6	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" FLAT BAR x 12" LONG	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE 2" x 6 1/2"	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
6 PANELS REQUIRED PER TANK.

GENERAL NOTES
WEIGHT (PER PANEL):

REFERENCE DRAWINGS	
NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	ASC	130517	
B	REVISED PER COMMENTS	RJB	130813	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED PROFESSIONAL ENGINEER
02-23-2015

Tuxtla GAS ENGINEERING LTD.

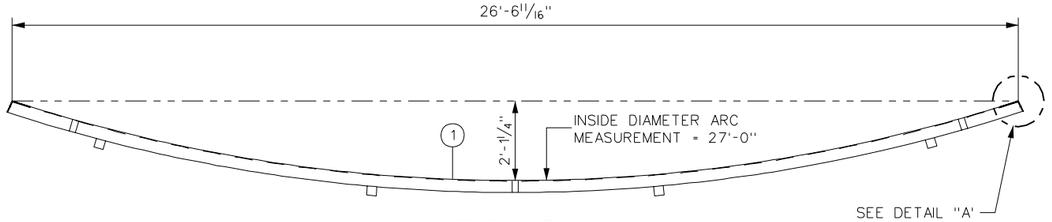
DRAWN	ASC	DATE	130517
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

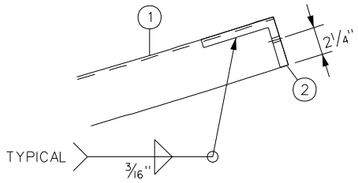
180,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-210	B

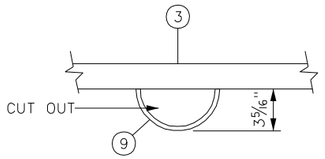
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-210.DGN



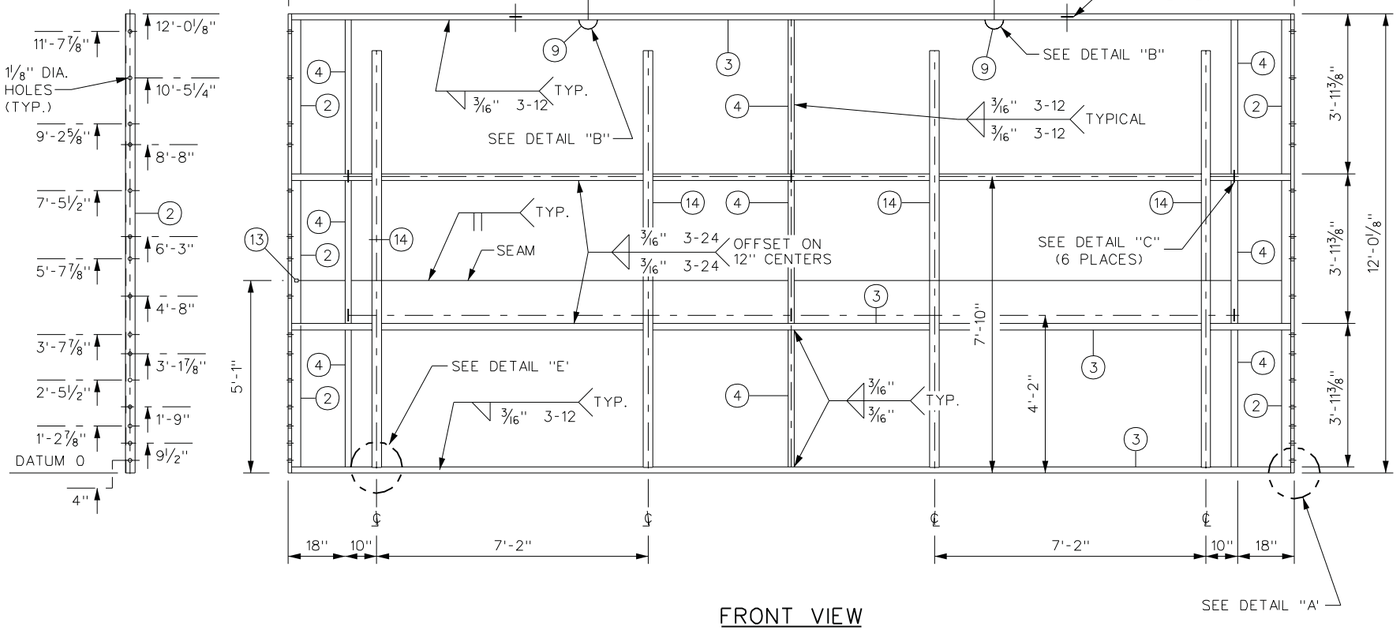
TOP VIEW
(SCALE: 1/4" = 1'-0")



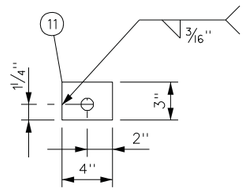
DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")

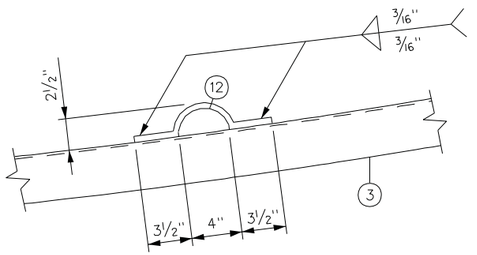


FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")

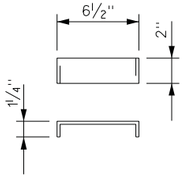


DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")

DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 27'-0" ROLLED EW TO 42'-11 5/8" RADIUS	A-36
2	2	4"x6" ANGLE x 1/2" x 12'-0"	44W
3	4	2"x4"x 1/4" HSS x 26'-11 3/8" ROLLED HW TO 42'-11 7/16" RADIUS	A-500
4	9	2"x4"x 1/4" RECT. TUBE x 3'-9 3/16"	A-500
5			
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10			
11	6	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" FLAT BAR x 12" LONG	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE 6 1/2" x 2"	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
10 PANELS REQUIRED PER TANK.

GENERAL NOTES
WEIGHT (PER PANEL):

REFERENCE DRAWINGS	
NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	ASC	130517	
B	REVISED PER COMMENTS	RJB	130813	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED PROFESSIONAL ENGINEER
02-23-2015

Tuxtla GAS ENGINEERING LTD.

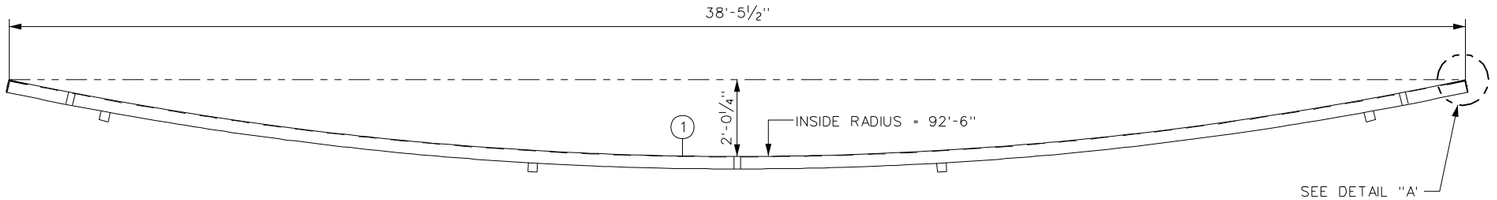
DRAWN	ASC	DATE	130517
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

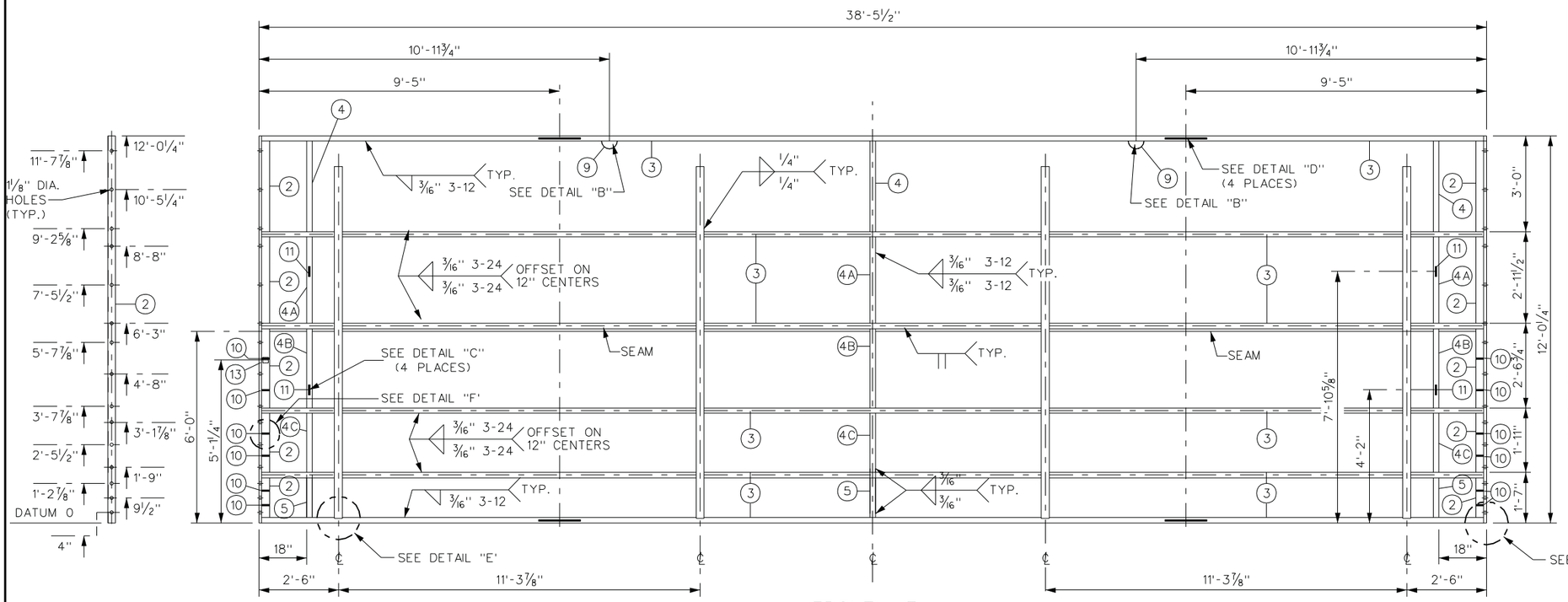
500,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-211	B

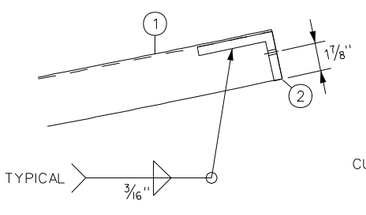
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-211.DGN



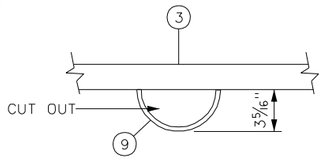
TOP VIEW
(SCALE: ¼" = 1'-0")



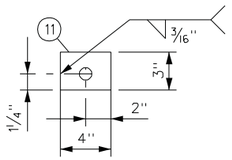
FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: ¼" = 1'-0")



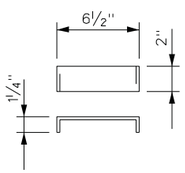
DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



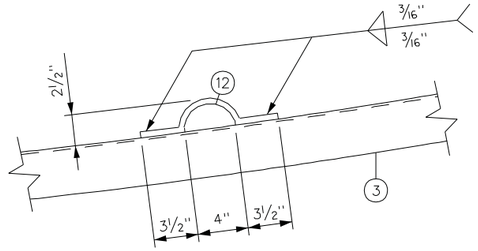
DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")



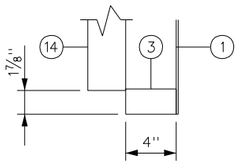
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



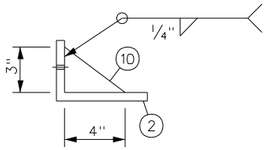
ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "F" (TYP.)
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 38'-9" ROLLED EW TO 185'-0 1/8"	A-36
2	2	4"x6" ANGLE x 3/4" x 12'-0"	44W
3	6	2"x4"x 1/4" HSS x 38'-8 7/8" ROLLED HW TO 148'-0 11/64"	A-500
4	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4A	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4B	3	2"x4"x 1/4" RECT. TUBE x 2'-4 3/8"	A-500
4C	3	2"x4"x 1/4" RECT. TUBE x 1'- 8 7/8"	A-500
5	3	2"x4"x 1/4" RECT. TUBE x 1'-2 7/8"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10	12	3/8"x4"x 3" PLATE	A-36
11	4	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE, 2"-6 1/2" LONG	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
15 PANELS REQUIRED PER TANK.

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RJB	130813	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED
PROFESSIONAL ENGINEER
02-23-2015

TUXTLA GAS ENGINEERING LTD.

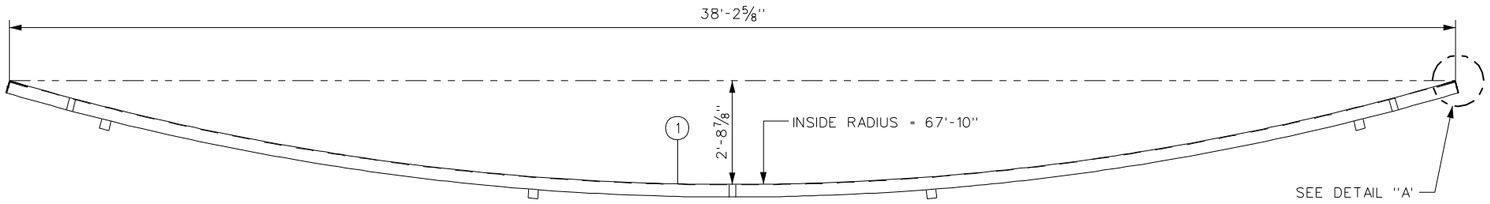
DRAWN	RJB	DATE	130813
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

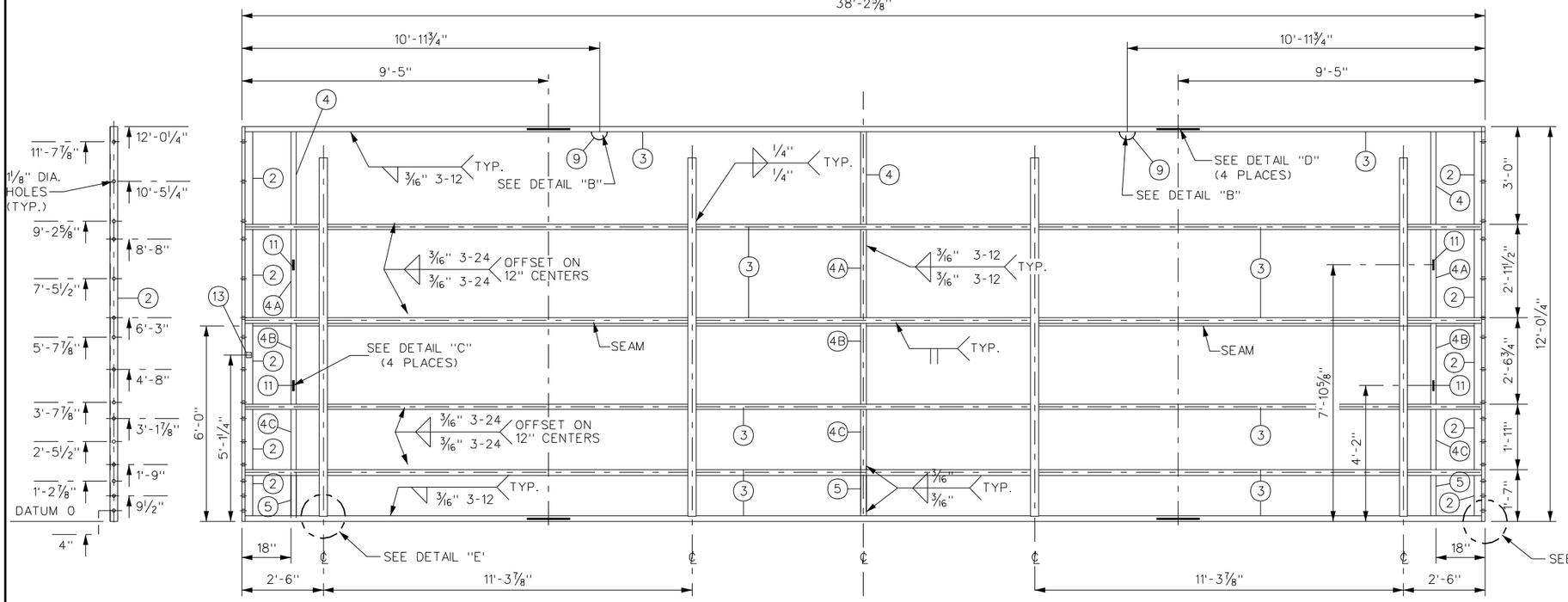
2,400,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-212	A

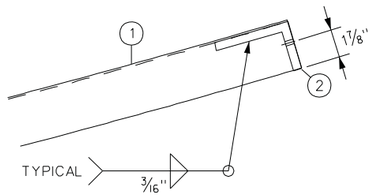
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-212.DGN



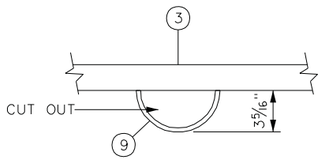
TOP VIEW
(SCALE: ¼" = 1'-0")



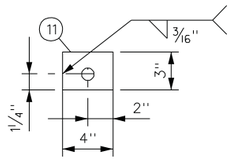
FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: ¼" = 1'-0")



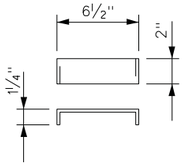
DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



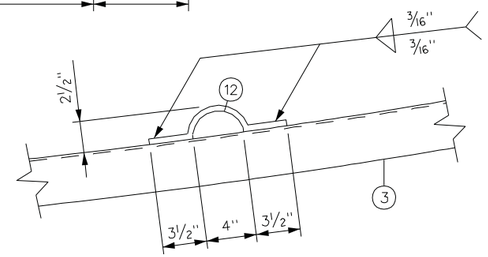
DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")



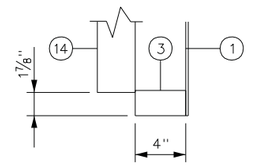
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	⅜" PLATE x 72" x 38'-9" ROLLED EW TO 135'-8⅛"	A-36
2	2	4"x6" ANGLE x ¾" x 12'-0"	44W
3	6	2"x4"x ¼" HSS x 38'-8⅞" ROLLED HW TO 135'-8⅛"	A-500
4	3	2"x4"x ¼" RECT. TUBE x 2'-9½"	A-500
4A	3	2"x4"x ¼" RECT. TUBE x 2'-9½"	A-500
4B	3	2"x4"x ¼" RECT. TUBE x 2'-4⅜"	A-500
4C	3	2"x4"x ¼" RECT. TUBE x 1'- 8⅞"	A-500
5	3	2"x4"x ¼" RECT. TUBE x 1'-2⅞"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4¼"	A-325
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3¾" (CUT IN HALF)	A-53B
10			
11	4	½"x4"x 3" PLATE	A-36
12	4	¾" x ¾" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET ⅛" PLATE, 2"-6½" LONG	A-36
14	4	3"x3"x ⅛" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
11 PANELS REQUIRED PER TANK.

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RJB	130826	
B	CHANGED STRUCTURAL BOLT MATERIAL	RJB	130926	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED PROFESSIONAL ENGINEER
02-23-2015

TUXTLA GAS ENGINEERING LTD.

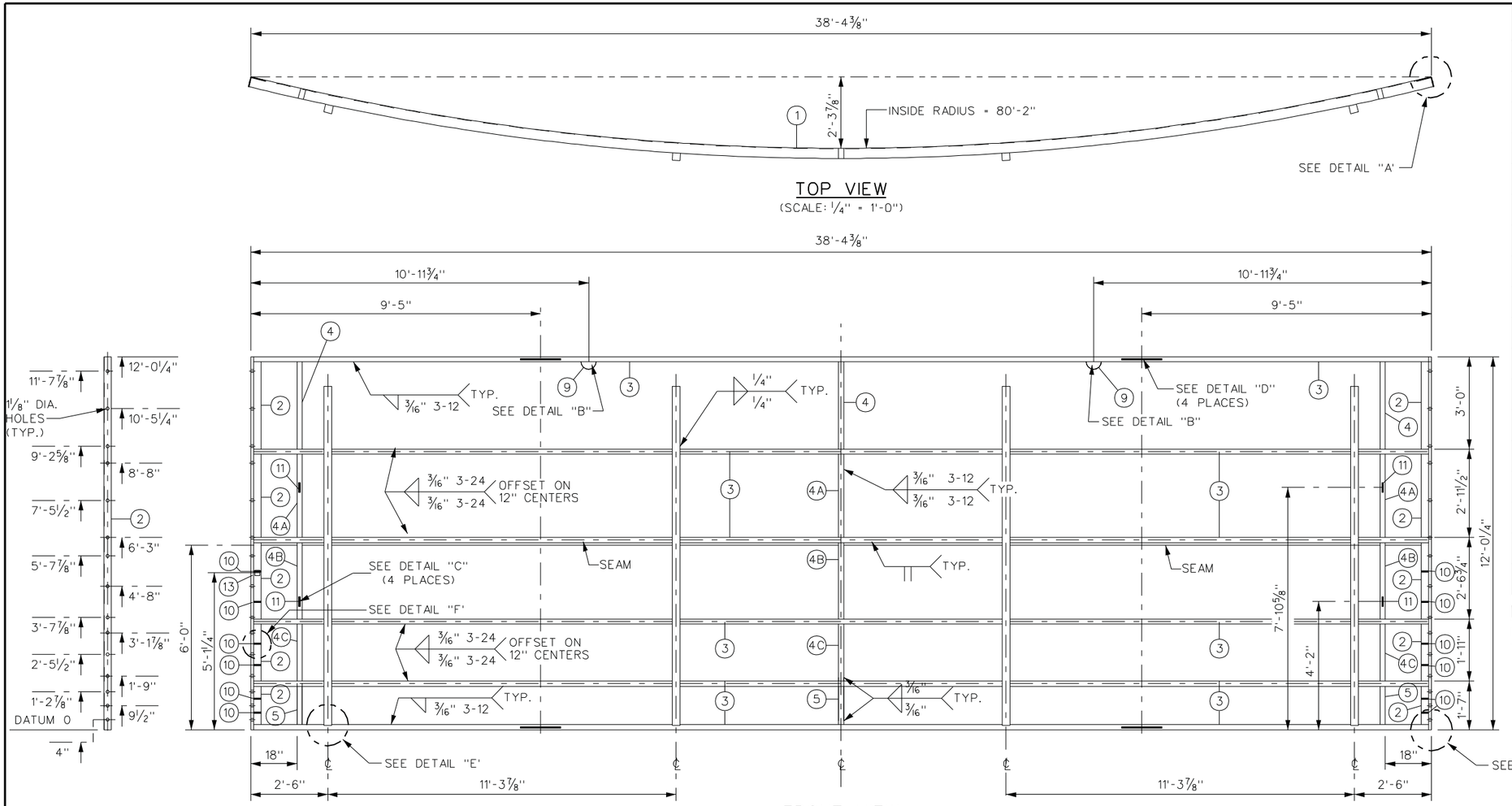
DRAWN	RJB	DATE	130826
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

1,250,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-213	B

CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-213.DGN



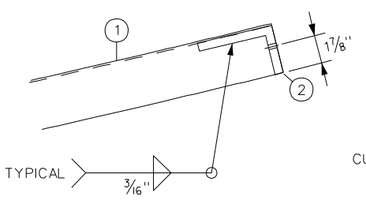
TOP VIEW
(SCALE: 1/4" = 1'-0")

FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")

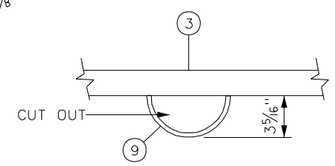
BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 38'-9" ROLLED EW TO 160'-4 1/2"	A-36
2	2	4"x6" ANGLE x 3/4" x 12'-0"	44W
3	6	2"x4"x 1/4" HSS x 38'-8 7/8" ROLLED HW TO 160'-4 1/2"	A-500
4	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4A	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4B	3	2"x4"x 1/4" RECT. TUBE x 2'-4 3/8"	A-500
4C	3	2"x4"x 1/4" RECT. TUBE x 1'- 8 7/8"	A-500
5	3	2"x4"x 1/4" RECT. TUBE x 1'-2 7/8"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10	12	3/8"x4"x 3" PLATE	A-36
11	4	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE, 2"-6 1/2" LONG	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

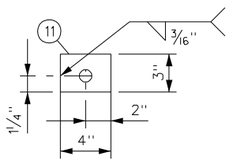
NOTE:
BOM IS FOR ONE PANEL,
13 PANELS REQUIRED PER TANK.



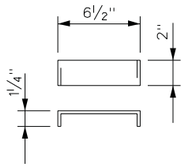
DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



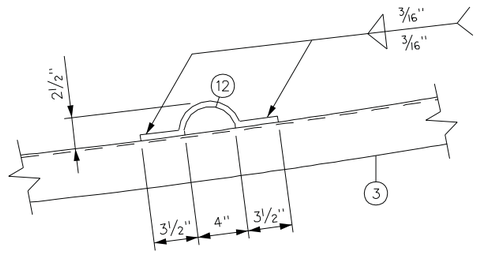
DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")



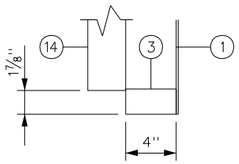
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



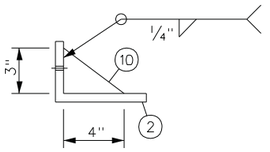
ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "F" (TYP.)
(SCALE: 1" = 1'-0")

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RJB	130826	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED
PROFESSIONAL ENGINEER
02-23-2015

TUXTLA GAS ENGINEERING LTD.

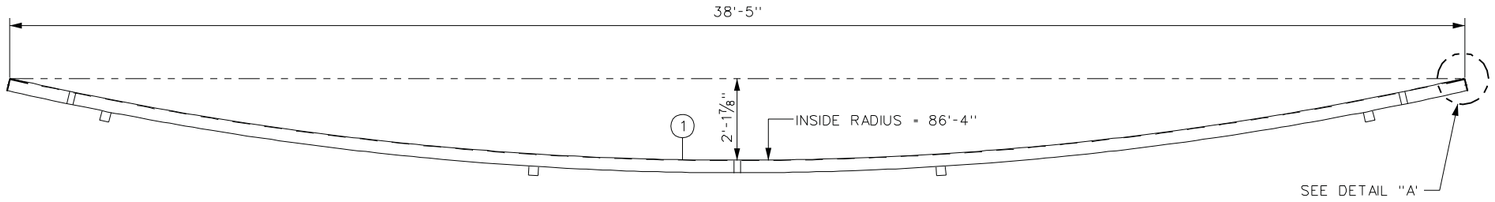
DRAWN	RJB	DATE	130826
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

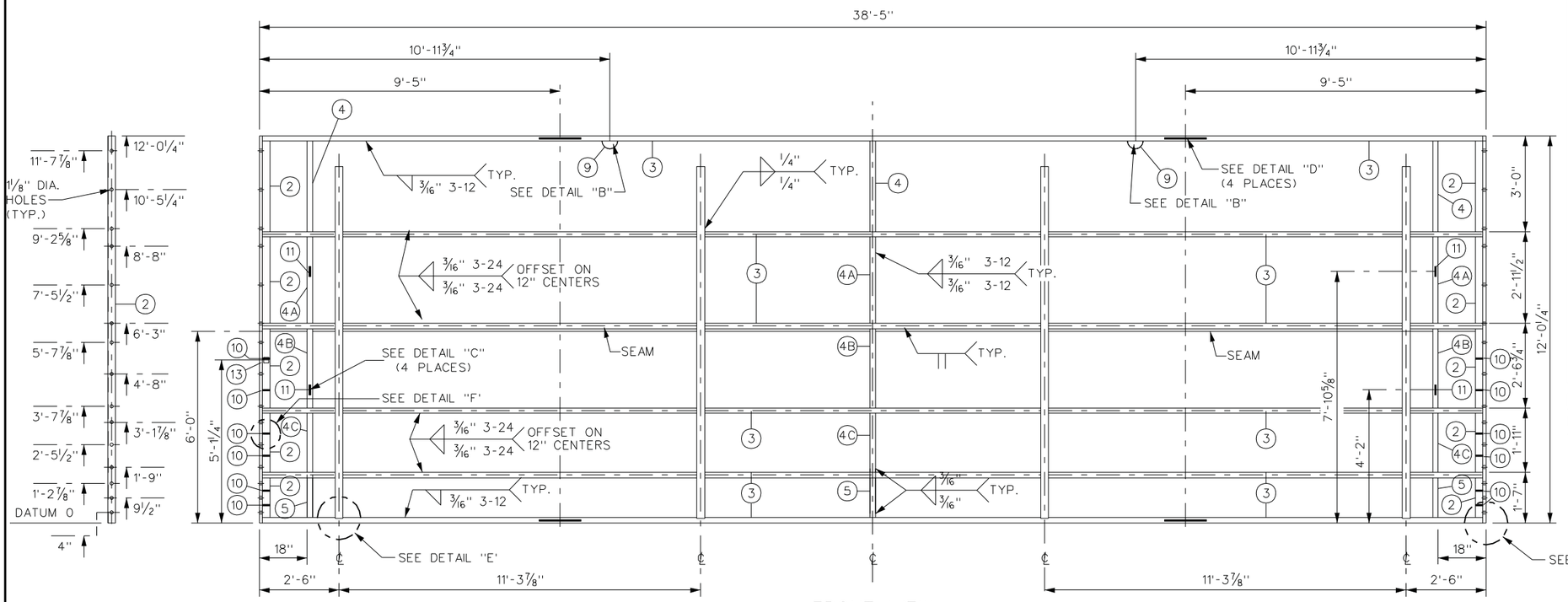
1,800,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-214	A

CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-214.DGN



TOP VIEW
(SCALE: ¼" = 1'-0")

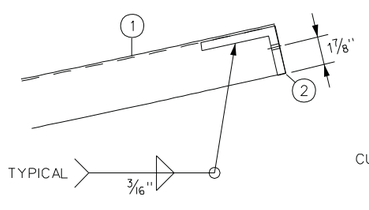


FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: ¼" = 1'-0")

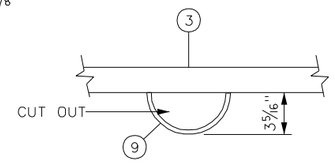
BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	⅜" PLATE x 72" x 38'-9" ROLLED EW TO 172'-8⅛"	A-36
2	2	4"x6" ANGLE x ¾" x 12'-0"	44W
3	6	2"x4"x ¼" HSS x 38'-8⅛" ROLLED HW TO 172'-8⅛"	A-500
4	3	2"x4"x ¼" RECT. TUBE x 2'-9½"	A-500
4A	3	2"x4"x ¼" RECT. TUBE x 2'-9½"	A-500
4B	3	2"x4"x ¼" RECT. TUBE x 2'-4⅜"	A-500
4C	3	2"x4"x ¼" RECT. TUBE x 1'- 8⅞"	A-500
5	3	2"x4"x ¼" RECT. TUBE x 1'-2⅞"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4¼"	A-490
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3¾" (CUT IN HALF)	A-53B
10	12	⅜"x4"x 3" PLATE	A-36
11	4	½"x4"x 3" PLATE	A-36
12	4	¾" x ¾" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET ⅛" PLATE, 2"-6½" LONG	A-36
14	4	3"x3"x ⅛" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
14 PANELS REQUIRED PER TANK.



DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")



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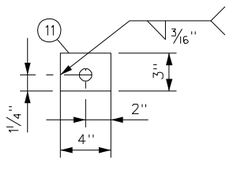
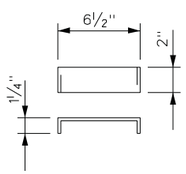
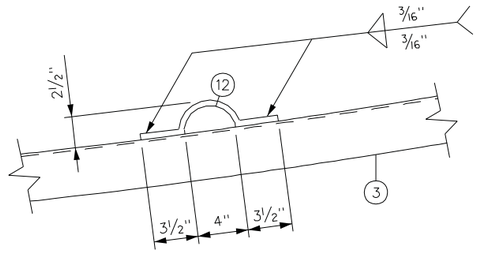


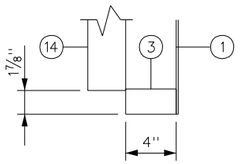
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



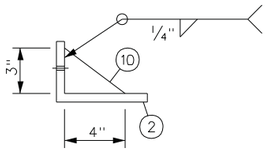
ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "F" (TYP.)
(SCALE: 1" = 1'-0")

GENERAL NOTES	REFERENCE DRAWINGS	
WEIGHT (PER PANEL):	NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RJB	130826	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED
PROFESSIONAL ENGINEER
02-23-2015

TUXTLA GAS ENGINEERING LTD.

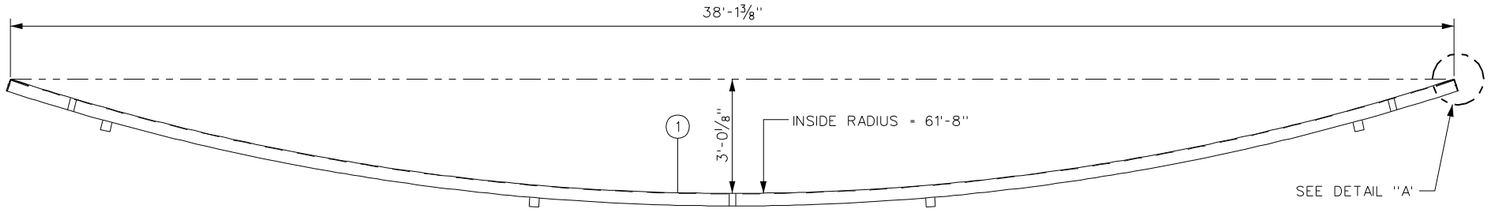
DRAWN	RJB	DATE	130826
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

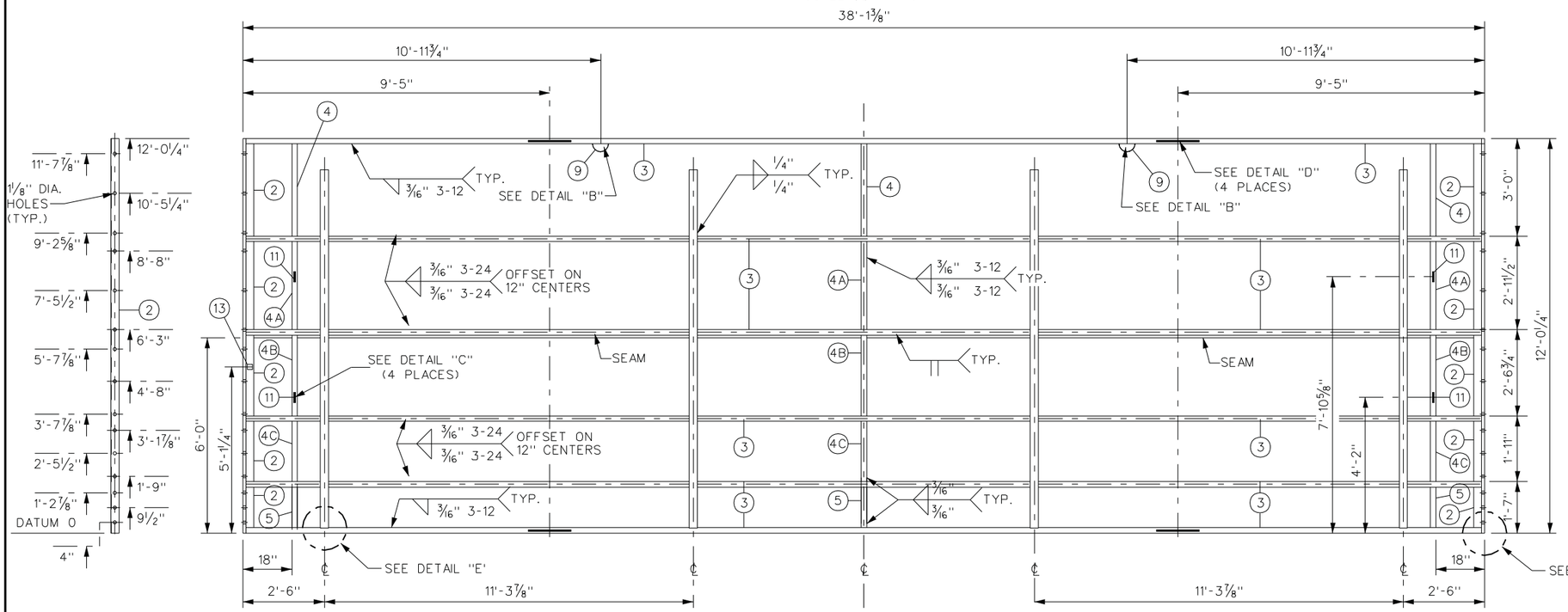
2,100,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-215	A

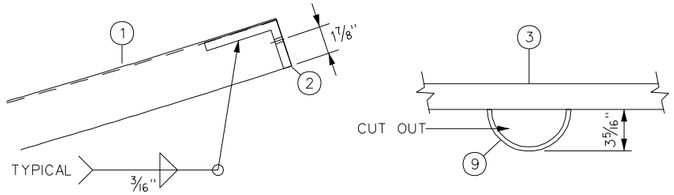
CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-215.DGN



TOP VIEW
(SCALE: 1/4" = 1'-0")

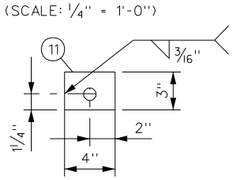


FRONT VIEW
NOTE: SHOWN IN FLAT VIEW
(SCALE: 1/4" = 1'-0")

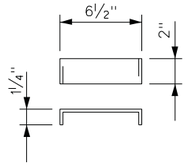


DETAIL "A" (TYP.)
NOTE: COPE HSS TO MATCH ANGLE PROFILE
(SCALE: 1" = 1'-0")

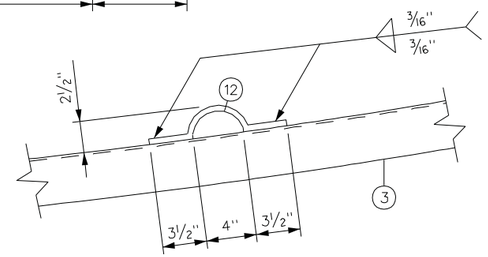
DETAIL "B" (TYP.)
(SCALE: 1" = 1'-0")



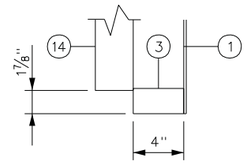
DETAIL "C" (TYP.)
(SCALE: 1" = 1'-0")



ITEM 13
(SCALE: 1" = 1'-0")



DETAIL "D" (TYP.)
(SCALE: 1" = 1'-0")



DETAIL "E" (TYP.)
(SCALE: 1" = 1'-0")

BILL OF MATERIALS

ITEM	QTY.	DESCRIPTION	MATERIAL
1	2	3/16" PLATE x 72" x 38'-9" ROLLED EW TO 123'-4 1/8"	A-36
2	2	4"x6" ANGLE x 3/4" x 12'-0"	44W
3	6	2"x4"x 1/4" HSS x 38'-8 7/8" ROLLED HW TO 123'-4 1/8"	A-500
4	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4A	3	2"x4"x 1/4" RECT. TUBE x 2'-9 1/2"	A-500
4B	3	2"x4"x 1/4" RECT. TUBE x 2'-4 3/8"	A-500
4C	3	2"x4"x 1/4" RECT. TUBE x 1'- 8 7/8"	A-500
5	3	2"x4"x 1/4" RECT. TUBE x 1'-2 7/8"	A-500
6	15	1" - 8 STRUCTURAL BOLT x 4 1/4"	A-325
7	15	1" - 8 HEAVY HEX NUT	A-194
8	30	1" FLAT WASHER	F-436
9	2	6" PIPE SHC. 40 x 3 3/4" (CUT IN HALF)	A-53B
10			
11	4	1/2"x4"x 3" PLATE	A-36
12	4	3/4" x 3/4" x 12" LONG FLAT BAR	A-36
13	1	NAMEPLATE BRACKET 1/8" PLATE, 2"-6 1/2" LONG	A-36
14	4	3"x3"x 1/8" RECT. TUBE x 11'-0"	A-500

NOTE:
BOM IS FOR ONE PANEL,
10 PANELS REQUIRED PER TANK.

GENERAL NOTES
WEIGHT (PER PANEL):

REFERENCE DRAWINGS	
NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	DATE:	CHK.
A	ISSUED FOR APPROVAL	RJB	130917	
B	CHANGED STRUCTURAL BOLT MATERIAL	RJB	130926	

STATE OF TEXAS
FRANK P PAWLAK III
112630
LICENSED
PROFESSIONAL ENGINEER
02-23-2015

Tuxtla GAS ENGINEERING LTD.

DRAWN	RJB	DATE	130917
CHK'D		DATE	
APPROVED:			
TUXTLA		BIG HOLDING SYSTEMS	
DATE		DATE	

BIG HOLDING SYSTEMS LTD.

1,000,000 GALLON STORAGE TANK
PANEL DETAILS

SCALE	DWG #	REV.
AS NOTED	2460-216	B

CAD FILE: /BIG HOLDING SYSTEMS/2460/2460-216.DGN

30 mil Reinforced LLDPE Specification

Terra Marine Geo –www.terramarinegeo.com

Thickness, Nominal (mils) Min. Ave. (mils)	ASTM D5199	Per Roll	30 27	36 32	45 40
Weight Nominal (lb/1000, ft^2) Min. Ave. (lb/1000, ft^2)	ASTM D5261	Per Roll	140 125	168 151	210 189
Grab Tensile Strength (lb), min. ave. Elongation (%), min. ave.	ASTM D7004 (each direction) (each direction)	30,000 lb	300 25	310 25	310 25
Tongue Tear (lb), min. ave.	ASTM D5884 (each direction)	30,000 lb	130	130	130
Index Puncture (lb), min. ave.	ASTM D4833	30,000 lb	85	103	105
Ply Adhesion (lb), min. ave.[1]	ASTM D6636	35,000 lb	20	25	25
Oxidative Induction Time (OIT)[2] (a) Standard OIT or (b) High Pressure OIT	ASTM D3895 ASTM D5885	Formulation	>100 >1000	>100 >1000	>100 >1000
Standard Roll Dimensions					
Roll Length[3], ft			11.83	11.83	11.83
Roll Length[3], ft			1500	1230	1000
Roll Area, ft[3]			17,745	14,551	11,830

Appendix D

Design/Construction Plan

General

In this plan, the portion of the Produced Water Re-use Rule that is addressed by certain text is underlined.

Examination of the engineering drawings in Appendix A, the SOP that is Appendix C, the text below and the history of solid performance of these ASTs demonstrates that Select Energy Services has designed and will construct the recycling containment to ensure the confinement of produced water, to prevent releases and to prevent overtopping due to wave action or rainfall. As the largest AST (BH 1800) is only 160 feet in diameter, wave action is not a meaningful consideration at 2-feet of freeboard.

This design and construction plan has been large abstracted from Appendix C. However, this Design and Construction Plan provides additional protocols to cause the proposed recycling containments (ASTs) to conform to NMOCD Rules. Therefore***, if a conflict exists between the SOP of Appendix C and this plan (Appendix B), Select Energy Services will adhere to the mandates of this plan.***

The Select Energy Services ASTs are constructed of 12-foot high steel panels and are netted to prevent ingress of migratory birds. At a minimum, a 4-foot, 4-strand barbed wire fence will surround the tank(s) to limit human egress.

The customer of Select Energy Services (the operator) shall post an upright sign no less than 12 inches by 24 inches with lettering not less than two inches in height in conspicuous places surrounding the containment. The operator shall post the sign in a manner and location such that a person can easily read the legend. The sign shall provide the following infom1ation: the operator's name, the location of the site by quarter-quarter or unit letter, section, township and range, and emergency telephone numbers.

Select Energy Services shall ensure that a recycling containment is screened, netted or otherwise protective of wildlife, including migratory birds. The operator shall on a monthly basis inspect for and, within 30 days of discovery, report the discovery of dead migratory birds or other wildlife to the appropriate wildlife agency and to the division district office in order to facilitate assessment and implementation of measures to prevent incidents from reoccurring. A light duty bird net is proposed to cover the containments.

Site Preparation

Foundation for AST

Preparation of the soils on site is required to form a dependable base for the AST. Preparation of the tank pad is the sole responsibility of Select Energy Services' AST customer (oil and gas operating company). In general, prior to constructing the containment foundation, the operator will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

The Select Energy Services Field Operations Manager will check the status of soil preparation during the pre-project meeting on site. Select Energy Services personnel will also check the soil preparation. Select Energy Services soil preparation requirements are as follows:

1. Select Energy Services recommends a minimum soil compaction of 95% compaction.
2. Select Energy Services recommends soil compaction testing to be conducted via
    a. Standard Proctor Test (American Society for Testing and Materials {ASTM} Standard D698) or Modified Proctor Test (ASTM Standard D1557).
    b. A proof roll test may be used if observed and documented by qualified Select Energy Services personnel.
3. Grade AST footprint and 30 feet work area to 0.25 % or 3" feet drop per 100 feet, toward sump location.
4. Site should be graveled prior to tank installation, utilizing. Do not use crushed rock as sharp edges could puncture the tank liner. After completion of these steps the tank setup can be approved.

Thus, the AST (recycling containment) will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that otherwise may compromise the liner's integrity.

Because Select Energy Services will not construct the containment in a levee, the following language of the Ruled does not apply:

> the inside grade is no steeper than two horizontal feet to one vertical foot (2H: 1 V) and the outside grade no steeper than three horizontal feet to one vertical foot (3H: IV). As the secondary liner covers the levee with the anchor trench outside of the containment, there is for inspection and maintenance of the anchor trench

Tank Layout on Foundation

- Check proposed AST site to confirm access for equipment and laydown area for AST materials and erection equipment.
- Check that the minimum distances to existing wells, power lines, etc. are met.
- Regardless of manufacturer, the minimum footprint should be a circle of at least 24' greater than that the radius of the tank.
- Establish final location for the suction tube and stairs.
- For a pin tank, the pad should be graded and sloped 0.25% from high side of location to suction side of tank. This will allow for better drainage of tank.

AST Tank Setup Preparation

Mark the Foundation for Setup

1. Determine center of tank and mark with paint, then bury preferred non-abrasive item (tennis ball, sand bag, water bottle, etc.) This will be used to find the center of tank after liners have been placed.
2. Measure distance from tank center to existing oil/gas wells to check that the tank meets the minimum distance for the operator
3. Measure and paint a line to mark the circumference of tank for panel placement.
4. Mark the circumference of the liner laid out flat to ensure the liner is properly placed.
5. Determine where tank suction is to be placed (the low side of pad).
   a. For pin tanks, dig 8' wide x 8' long x 16" deep sump hole for the suction manifold to set in and taper the edges so there are no sharp corners of the excavation. Remove any sharp stones
   b. If multiple suction manifolds are required, the sumps should have a minimum of 8' of separation. Attention! In cold weather conditions, the sumps should be dug out as late as possible and should never be left unattended overnight. Barricade any sump pit with appropriate cones or tape if left open when crew is not present or active in the area.
6. When installing certain ASTs, a "Y Trench" can be used both for wind stabilization and for draining the tank.

The placement of sumps in the foundation and the AST design demonstrates that at a point of discharge into or suction from the recycling containment, the liner is protected from excessive hydrostatic force or mechanical damage and external discharge or suction lines shall not penetrate the liner.

Liner and Leak Detection Materials

The liner and geotextile specifications in Appendix C show that all primary (upper) liners in a recycling containment shall be geomembrane liners composed of an impervious, synthetic material that is resistant to ultraviolet light, petroleum hydrocarbons, salts and acidic and alkaline solutions. All primary liners shall be 45-mil LLDPE string reinforced (minimum). A variance has been approved by OCD to allow use a double-liner system that results in equivalent or better characteristics.

Secondary liners shall be 30-mil LLDPE string reinforced (minimum) or equivalent with a hydraulic conductivity no greater than 1 x 10-9 cm/sec.

Liner compatibility shall meet or exceed the EPA SW-846 method 9090A or subsequent relevant publications.

Install Secondary Liner, Leak Detection System and Secondary Containment

All tanks holding produced water will have a primary (upper) liner and a secondary (lower) liner with a leak detection system appropriate to the site's conditions. The edges of all secondary liners

shall be anchored in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

The steps to install the secondary liner are:

1. The crew walks the entire tank base area to and pick up any sharp stones or other sharp debris that could damage the liner.
2. If necessary, lay out a geotextile to create a pad between the liner and the earth foundation. In some cases, the geotextile is "bundled" with the liner and will be rolled out together. After unrolling, pull the geotextile and liner to extend it fully using several crew members spaced along the edge.
3. Perform a visual inspection n of the liner – repair any defects as necessary.
4. Install a 30-mil or 40-mil LLDPE secondary liner per the manufacturer's specifications
5. Within and extending several feet from the footprint of the AST, place 200-mil geogrid or 10-oz geotextile and secure to the secondary liner. This geotextile material is permeable and will act as the drainage layer between the primary liner system and the secondary liner. Any leakage from the AST will be obvious as the fluid moves from beneath the AST
6. In the deepest section of the sump place a water sensor (conductivity probe) and a length of rigid tubing (1/2 inch or smaller diameter) above the secondary liner and below the geotextile. The sensor wire and tubing extends beyond the diameter of the tank to facilitate leak detection and fluid removal (see O&M plan).

Thus, the recycling containment will have a leak detection system between the upper and lower geomembrane liners that shall consist of 200-mil geonet (or a suitable material pursuant to a variance) to facilitate drainage. The leak detection system shall consist of a properly designed drainage and collection and removal system placed above the lower geomembrane liner in depressions and sloped to facilitate the earliest possible leak detection.

The 12-foot high tank walls effectively prevent run-on of surface water and qualify as a diversion to prevent run-on of surface water,

AST Tank Setup

Install Primary Liner

As with the secondary liner, Select Energy Services will minimize liner seams and orient them up and down, as much as possible, not across, a slope. Factory welded seams shall be used where possible. Select Energy Services will employ field seams in geosynthetic material that are thermally seamed. Prior to field seaming, Select Energy Services shall overlap liners four to six inches and minimize the number of field seams and corners and irregularly shaped areas. There shall be no horizontal seams within five feet of the AST bottom. Qualified personnel shall perform field welding and testing.

Installation set up consistent with the SOP (Appendix E) continues:

A. Two 30-mil LLDPE string reinforced liners create the primary system aligned to the center of the tank and painted line for the tank walls. A preferred 30 feet area around tank allows the liner to be laid out flat so that fold back can be uniform.
B. Bundling of the liner with the drainage geotextile by the liner supplier is generally not used in New Mexico. If the liner is bundled with the geotextile, roll it out across the diameter of the tank over the geotextile material that extends beyond the AST diameter (described above). Be sure not to use padded vice grips to move liner unless located at edge of liner. Inspect liner and report any damage or bad seams, punctures due to handling, etc. to the Crew Leader
C. Secure liner from wind using sand bags
D. Fold the liner toward inside the painted tank edge line to allow stockpiling of sand and placement tank panel walls.

Tank Wall Erection

E. Stand the first tank panel in place and keep connected to the hoist mechanism until all the remaining panels have been connected. This will be done using a front-end loader equipped with an engineer-approved attachment specific for this task.
F. Monitor hoist and rigging mechanism of first panel closely to ensure it remains stable, especially during wind and while the other panels are attached.
G. Begin placing the remaining panels in place with the front-end loader and panel rigging frame
H. Personnel secured on man-lift then secure the panels in place with 4 pins each (for pin tanks) or with the connecting plates and lug busses, secured with chained cotter pins.
I. To protect the liner, distribute sand with shovels to form 1:1 sand bank against the inside bottom of each panel. Be sure the slope is uniform. Alternatively, roll up excess geo pad (geotextile) into minimum 6” diameter cylinders around the inside of the tank ring to help support the liner at the base of the tank wall as the tank is being filled.
J. Prior to lifting liner into place against inside panel, place metal covering plates over all panel gaps in plate type tank. For pin tanks, check that sand or rolled up geo pad is evenly placed at base of all walls.
K. Prior to covering sump with the geo pad or liner, confirm sump excavation has smooth sides and corners, and that no sharp stones are present.
L. When placing the final panel in the circle, attach this final panel only on left or right side but LEAVE OTHER PANEL SIDE OPEN at this time for access and egress points. (Must have an entry and exit point to the tank at all times.)

Liner Placement and Securing Top With Clips or Clamps

M. After 4 or 5 panels are set, and all liner protection as described above is in place, unfold the liner in sections, toward the base of each panel,.
N. Crew of 2 inside the tank wall unfolds and pulls the liner toward each panel. Working in small liner sections, this inside crew works with a crew of 2 on a man lift located outside and above each tank panel to pull the liner edge up and over the top of each panel. The man lift crew lifts the liner edge using ropes attached (by the inside crew) to padded vice grips that grip the liner. The man lift crew lifts a small liner section to the top of the panel and folds it over the top of the panel, being sure there is enough slack in the liner inside the panel wall.

O. Once a section of liner is positioned properly (with liner slack inside the tank) and over the top of each panel wall, the man lift crew secures the top of the liner with clips (pin tanks) or clamps. NOTE: A minimum of 5 clips (pin tanks) or 5 clamps or more are required at the top of each tank panel to secure the liner. Add additional clips and clamps as needed to secure liner.
P. Both inside and man lift crews continue this process, working around the tank, one or two panels at a time, until the entire liner is in place. NOTE: The crew must allow sufficient slack in the liner at the wall to allow for liner movement during filling and draining.

Stairs, Fill Tubes, and Suction Tubes

I. Install safety stair system, fill tubes, and suction tubes. Ensure that stair system and tubes are appropriately secured to the tank walls according to customer specifications.
II. Upon completion of the stair system installation, the stairs should be secured as per the operating company requirements.

Final Steps, Filling, and Inspection

- Close final panel and secure with pins or plates as needed.
- Trim liner and allow approximately 3’ of liner to hang over edge of tank.
- Secure liner with sufficient clips or clamps and be sure ratchet straps are applied to all tanks.
- Place straps to secure the cut edge of liner on outside of tank.
- Inspect all connections and equipment, confirming at least 5 liner clips or clamps (or more as needed) are in place on top of each panel.
- Have a minimum of 8 inches of water put in the high side of the tank to check for leaks and to hold liner in place.
- Fill tank and monitor.
- If tank remains on site for any period longer than 7 days perform periodic inspections of the tank to ensure everything is in proper working order.
- Every time a tank is fully emptied and refilled, an inspection must be performed.
- Visibly inspect all tank panels and stairs for cracking, dents, burrs on the inside of the panels, chipping paint on welds or sharp edges on panels.
- Look for any cracked or broken valves, damage on pipes and tubes, missing D-Rings, damage to chains or ratchets, and bent clips.
- Pay close attention to hinge plates for chipping paint and cracking.
- Water must NEVER go below 24 inches at the LOWEST level in the tank. (Mark this on the liner as a caution).

Appendix E
Select SOP

BIG HOLDING SYSTEMS LTD.

MASTER ASSEMBLY MANUAL

-FOR-

“GENERATION 3” MOBILE WATER STORAGE TANK MODELS:

BH-1000	**BH-1800**
BH-1250	**BH-2100**
BH-1500	**BH-2400**

INSTALLATION INSTRUCTIONS FOR MOBILE

WATER STORAGE TANKS

Think Safety First

Big Holding Systems Ltd. ("BHS") is committed to provide quality tanks and components that can be safely and efficiently erected. It is strongly recommended that safe working conditions and accident prevention practices are always the top priority on any job site. Local, provincial/state and federal safety and health standards should always be followed to help ensure worker safety. Make certain all employees have been trained and know the safest and most predictive way of erecting a BHS mobile tank BEFORE starting construction, including specific operations such as site preparation, steel ring installation, liner installation and testing, nozzle installation and first fill. Emergency telephone numbers, location of first aid stations and emergency procedures should be known to all employees. Daily meetings highlighting safety procedures, the use of hard hats, safety glasses, steel toed work boots, and high visibility vests or coveralls must be used. Suitable and compliant heavy lift equipment and accessories must be in good repair for handling heavy materials. BHS supplied installation supports are specifically designed for safe installation in windy conditions are highly recommended. BHS intends that this manual be interpreted and administered with sound judgment consistent with good safety practices.

INSTALLATION PROCEDURE FOR BH LARGE VOLUME MOBILE

FLUID STORAGE TANKS

This tank installation procedure is specifically for the following BHS mobile fluid storage tanks using "bucket style" liners. Please ensure that you have correctly identified the tank model before beginning installation.

BH-1000 (10 panels)	BH-1800 (13 panels)
BH-1250 (11 panels)	BH-2100 (14 panels)
BH-1500 (12 panels)	BH-2400 (15 panels)

Each panel for the above tanks measures approximately 38.75 ft. (11.8m) long X 12 ft. (3.67m) high, and feature a bolted joint design.

This Installation Procedure will describe required activities from “site preparation” to “ready for operations” inclusive in numerical order for easy reference.

SITE PREPARATION

1. The area where the water storage tank will be installed must be prepared and brought to a state of level that is +/- 2 inches (5 cm) including an area 10 ft (3 meters) outside the circumference of the tank walls.

2. Grade and compact tank site with granular soils. Compaction of the tank site must be 40 kpa minimum. Ensure that the grade is within +/- 2 inches (5 cm) level where the tank(s) will be placed. Ensure that there are no sharp edges or rocks within the prepared area. Add 1-2 inches of fine sand cover on top of the compacted granular soils.

3. Using a backhoe or manually dig a 12 inch deep X 18 inches wide trench from the outside wall towards the center of the tank on the location that the client plans to have the largest nozzle installed. This trench will allow efficient emptying of the tank contents when the client wishes to move the tank to a new location.

4. Immediately prior to the delivery of the tanks, install 2 layers of #8 to #12 felt geotextile material on the tank installation area. Secure the geotextile with sand bags.

5. Establish the exact center of where the tank is to be installed. Ensure that the tank placement provides for sufficient work space to the tank installation; ideally 30 ft. (10 meters) around the circumference of the tank. Mark with spray paint the center point of each tank and the circumference of each tank to be erected. BHS tank radii and circumferences are as follows:

Tank Model	Radius	Circumference
a. BH-1000 (1.07 MM USG)	61 ft. 8 in. (18.8m)	387 ft. (118m)
b. BH-1250 (1.28 MM USG)	67 ft. 10 in. (20.7m)	426 ft. (130m)
c. BH-1500 (1.54 MM USG)	74 ft. 0 in. (22.6m)	465 ft. (142m)
d. BH-1800 (1.81 MM USG)	80 ft. 2 in. (24.4m)	504 ft. (154m)
e. BH-2100 (2.10 MM USG)	86 ft. 4 in. (26.3m)	543 ft. (166m)
f. BH-2400 (2.41 MM USG)	92 ft. 6 in. (28.2m)	581 ft. (177m)

2 DAYS PRIOR TO TANK RECEIPT

6. Immediately prior to delivery of the tank, ensure the following equipment is available:

    a. One all-terrain, 45-60 ton capacity rubber tired articulated crane with an auxiliary winch.
    b. One skid steer
    c. One genie boom.
    d. Two 15 foot spreader bars with lift straps.
    e. Two 16 foot step ladders.
    f. One 5000 watt generator.
    g. Laser level and 2 X 200 ft. tape measures.
    h. 2 fully charged portable electric impact wrenches.
    i. Minimum 200 sand bags to assist in windy conditions.
    j. At least 3 personal harnesses, and at least 1 stretcher harness, that will be used by workers inside the erected tank to provide for man lift evacuation in the unlikely event of an injury.
    k. A polyethylene extrusion welding kit, weld rod, and vacuum testing kit.
    l. For conductive style liners, a conductive polyethylene

TANK RECEIPT ON INSTALLATION SITE

7. On the day of tank delivery, ensure 1 supervisor, 6-7 installation personnel and one crane operator are available to provide labor to install the tanks and, subject to the client's experience with tank and liner installation, supervision of Big Holding Systems' personnel. All personnel should be provided with personal protective equipment (PPE) and high visibility vests.

8. Conduct safety meeting. Identify hazards and discuss mitigation measures to ensure safety. Note that when the tank walls are all installed, personnel inside the tank may be subject to enclosed space regulations or operations.

9. Unload the following equipment from the tank delivery trucks (per tank):

    a. 10 - 15 tank panels per tank, each panel being approximately 38.75 ft. (11.8m) long X 12 ft. (3.67m) high, 6500 lbs (2950 kg). If possible, arrange to have the delivery truck

follow the crane to allow for a single handling and unloading of each panel. If this is not possible, provide sufficient room outside of the tank bottom area, and lay the panels outside of the planned perimeter (see item 4 above).

b. 6 outside and 3 inside installation supports. These supports are required to support the tank panels during installation, 2 outside supports and 1 inside support per panel.
c. 1 inch diameter SAE Grade coarse thread bolts and studs, minimum 15 sets per tank segment.
d. Approximately 10 liner clips per segment purchased, each with a retainer bolt.
e. 1 – 8 inch 150# ANSI u-tube design fluid nozzles each c/w support brackets, 8 inch flexible hose, splash plate and butterfly valve (or similar subject to what the client has ordered).
f. 1-2 40 mil tank liners, rolled up, suitable for the tank size purchased.
g. Strips of 40 mil liner material for each tank section, 2 ft. wide X 12 ft. tall, plus tape (optional).
h. Tank skirt strips, 3 ft. wide of 40 mil liner material sufficient for the circumference of the tank being erected, plus tape (optional).
i. One diameter floating insulation cover (if ordered).

10. Plan the tank layout so that a panel joint is located where the fluid nozzle(s) are to be installed.

TANK INSTALLATION:

General:

11. Conduct safety meeting before each day's work to describe the day's activities and discuss potential hazards. Document meeting minutes, attendees, any concerns and risk mitigation activities.

12. Ensure work permits are issued by the Site Operator as required.

13. Always inspect the tank bolts and nuts and replace as required.

14. Before starting, the client should determine where the fluid nozzles are to be located.

15. CAREFULLY spot the liner in the center of the tank position as marked. The liner center point has been marked if the liner has been supplied by GSE.

16. CAREFULLY unfold the liner until the entire floor has been exposed and matches up with the perimeter line drawn with spray paint.

17. CAREFULLY roll the liner back toward its center to provide minimum 15 feet of work space between the floor perimeter and the liner material.

18. Review the lifting plan with the crew and crane operator. Identify any potential risks specific to the site, including inclement wind and weather, condition of the tank site. Erect the tank as described in the Schedules noted below. Care must be taken when "flying" each panel into place to avoid injuries at the panel joints or ground contact. Each panel weighs approximately 6500 pounds (2950 kg) and for this reason BHS recommends that panel supports are always used during the installation of the panels.

Schedule 1: Model BH-1000 - 10 segments, inside tank diameter = 123' 4" (37.6m)

Schedule 2: Model BH-1250 - 11 segments, inside tank diameter = 135' 8" (41.4m)

Schedule 3: Model BH-1500 - 12 segments, inside tank diameter = 148' 0" (45.2m)

Schedule 4: Model BH-1800 - 13 segments, inside tank diameter = 160' 4" (48.8m)

Schedule 5: Model BH-2100 - 14 segments, inside tank diameter = 172' 8" (52.6m)

Schedule 6: Model BH-2400 - 15 segments, inside tank diameter = 185' 0" (56.4m)

NOTE: <u>At least the first 3 tank panels should be braced on both sides until all panels are fully bolted together even on calm days.</u>

19. Complete erection of all but one of the tank sections and then perform final tightening of bolts to a torque of 150 foot pounds. **NOTE:** Leave bolts where the candy cane is attached only finger tight until candy cane is attached and adjusted.

20. <u>Liner Installation:</u>

    a. (Optional) Place the 12 – 40 mil HDPE strips (2 ft. X 12 ft.) inside the tank. Tape a strip covering each inside joint ensuring that there is approximately 6 inches of slack in the horizontal direction which will allow the strip to stay in place with any movement of the tank.

b. (Optional) Place the 40 mil HDPE strips (3 ft. wide) inside the tank. Tape the strip covering the inside circumference approximately 18 inches from the bottom of the tank which will allow the strip to protect the tank liner from being damaged between the tank wall and the compacted ground.

c. CAREFULLY unroll the tank liner to the inside edge of the assembled tank. From the tank interior, use 2 of the adjacent liner eyes and pull bars with clips and feed the ropes to the scissor lift. Have one person leave the inside of the tank.

d. Initially from the crane or the knuckle boom, and later from the scissor lift, pull the liner wall up and fold the surplus liner over the top of the tank channel. Install the liner clips over the liner and onto the top tank channel spaced approximately 3 feet apart. The liner clips shall be installed with the ½ inch retainer bolt on the outside of the tank wall. As each clip is put in place, secure the retainer bolt on the outside of the tank wall (the clips are designed to be a friction fit for the liner wall and, if properly installed, won't damage the liner). **GENTLY** adjust the liner bottom to the tank wall to eliminate extra tension from the liner wall on the clips; the liner walls should be "relaxed" to allow the liner to contact the steel walls when the tank is filled. Continue around the perimeter of the tank until the liner is fully installed. **NOTE:** Should a liner clip accidently be dropped inside the tank, this must be immediately examined and reported. The likelihood of damage to the bucket liner is high should this occur, so repair may be required.

21. Identify the position where the "candy cane" fluid nozzles will be placed.

22. Using the crane, CAREFULLY install the “candy cane” nozzle over the lip of the tank and secure into place.

23. CAREFULLY Install the 10 ft. flexible hose and slotted suction pipe on the inside of the tank connected to the inside nozzle connection. Ideally the slotted suction pipe should be placed in the 12 inch deep X 18 inch trench that had been prepared as part of the site preparation described in item 3 above.

24. (Optional) Install the supplied digital level sensor to mounting tabs on candy cane and adjust per instructions supplied by level sensor manufacturer**. NOTE:** Electric power supply to digital level sensor to be supplied by customer. All wiring should be done by an experienced/licensed electrician.

25. Repeat Steps 22 to 23 inclusive for any additional "candy cane" nozzles.

26. CAREFULLY visually inspect the entire tank liner floor and walls for blemishes. The tank liner is specifically designed with an outside white layer covering the inside black material, which allows for more obvious appearance of any damage to the upper white layer. Repair and vacuum test any blemishes, documenting all repairs for future reference.

27. (Optional) If the bucket style liner has been built from conductive material, CAREFULLY test the liner walls and floor with an electronic testing device as noted below. NOTE that this inspection must be conducted by an experienced technician as the tester does require calibration and does rely on voltage resistance detection, and is therefore powered. Repair and vacuum test any blemishes, documenting all repairs for future reference.

28. Insulated Cover Installation: CAREFULLY place the insulation cover bundles inside the tank.

29. Assemble the insulation cover as per the installation map, taking care to ensure that the cover lays over the 8 inch flexible hoses. Install the ballast tubes along the perimeter of the cover and evenly spaced elsewhere to ensure the cover will remain in place during windy conditions.

30. CAREFULLY inspect the entire insulation cover and the tank liner walls for blemishes. Repair and vacuum test any blemishes, documenting all repairs for future reference.

31. The tank is now ready to be filled with fluid and be turned over to tank operations. During the filling process, observe the insulation cover to ensure that the cover does not bind on the nozzles or tank walls.

PLEASE NOTE: DISMANTLING OF THE STORAGE TANK FOR TRANSPORT AND USE AT ANOTHER SITE SHOULD BE ACCOMPLISHED IN THE REVERSE MANNER OF THE PRECEDING STEPS. ALSO, DO NOT FORGET TO USE THE SEGMENT SHIPPING SUPPORT THAT WAS SUPPLIED WITH THE ORIGINAL TANK AS IT WILL HELP PROTECT THE INTEGRITY OF THE SECTIONS.

FOR MORE INFORMATION REGARDING THESE TANKS, LINERS AND INSTALLATION PROCEDURES PLEASE CONTACT:

2800 - 350 7th Avenue S.W.
Calgary, Alberta T2P 0N3
Phone: (403) 930-1433
Website: www.bigholdingsystems.com

SCHEDULE 1

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-1000 TANK (10 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank, however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 72 feet, 6.0 inches (22.098m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-1000 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		72’ 6.0”	99’ 9.5”	117’ 3.0”	123’ 4.2”	117’ 3.0”	99’ 9.5”
Chord (m)		22.098	30.415	35.756	37.596	35.756	30.415

PANEL #	8	9	10				
Chord (ft)	72’ 6.0”	38’ 1.5”					
Chord (m)	22.098	11.618					

SCHEDULE 2

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-1250 TANK (11 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank, however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 73 feet, 6.0 inches (22.404m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-1250 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		73’ 6.0”	102’ 9.0”	123’ 8.0”	134’ 7.0”	134’ 7.0”	123’ 8.0”
Chord (m)		22.404	31.319	37.696	41.019	41.019	37.696

PANEL #	8	9	10	11			
Chord (ft)	102’ 9.0”	73’ 6.0”	38’ 3.7”				
Chord (m)	31.319	22.404	11.675				

SCHEDULE 3

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-1500 TANK (12 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank; however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 74 feet, 0 inches (22.557m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-1500 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		74’ 0”	104’ 8.0”	128’ 2.20”	142’ 11.7”	148’ 0”	142’ 11.7”
Chord (m)		22.557	31.901	39.070	43.557	45.115	43.557

PANEL #	8	9	10	11	12		
Chord (ft)	128’ 2.2”	104’ 8.0”	74’ 0”	38’ 3.7”			
Chord (m)	39.070	31.901	22.557	11.677			

SCHEDULE 4

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-1800 TANK (13 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank; however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 74 feet, 6.2 inches (22.713m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-1800 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		74’ 6.2”	106’ 4.0”	131’ 11.5”	149’ 11.2”	159’ 2.2”	159’ 2.2”
Chord (m)		22.713	32.410	40.223	45.698	48.518	48.518

PANEL #	8	9	10	11	12	13	
Chord (ft)	149’ 11.2	131’ 11.5”	106’ 4.0”	74’ 6.2”	38’ 4.5”		
Chord (m)	48.518	40.223	32.410	22.713	11.696		

SCHEDULE 5

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-2100 TANK (14 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank; however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 74 feet, 10.3 inches (22.837m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-2100 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		74’ 10.3”	107’ 8.0”	135’ 0”	155’ 7.0”	168’ 4.3”	172’ 8.3”
Chord (m)		22.837	32.817	41.151	47.421	51.314	52.634

PANEL #	8	9	10	11	12	13	14
Chord (ft)	168’ 4.3	155’ 7.0”	135’ 0”	107’ 8.0”	74’ 10.3”	38’ 5 1/8”	
Chord (m)	51.314	47.421	41.151	32.817	22.837	11.712	

SCHEDULE 6

PANEL INSTALLATION PROCESS FOR GENERATION 3 BH-2400 TANK (15 PANELS)

As described in item 5 of this Installation Manual, it is recommended that the circumference of the tank wall be spray painted on the geo-textile base before installation of the panels. This marking is an approximate reference for the tank; however, in order to efficiently install the panels and ensure that the last panel fits properly, we highly recommend the following procedure of measuring tank chords after every panel is installed.

1. Using appropriately rated canvas lifting straps lift and place the first tank panel in the position desired for the nozzle orientation. Install the support jigs (2 external, 1 internal) on this panel while it is securely held by the crane.

2. Select a 2nd tank panel and, using appropriately rated canvas lifting straps, lift and place this 2nd panel adjacent to the first panel. Install the support jigs (2 external, 1 internal). Adjust until the top and bottom bolts can be made up between the segments and adjust until all bolts can be made up. Finalize the position of this 2nd tank panel initially with reference to the spray circumference marking and finally by measuring the distance from the ends of the 1st and 2nd segments, using the inside edge of the tank wall. The **distance (chord)** from the inside edge of the segments, measured at the base, **shall be 75 feet, 3.0 inches (22.937m)**. Adjust accordingly.

3. Repeat step 2 with the rest of the panels, using the chord measurement to finalize the position of each panel. The chord measurements are provided in the table below:

BH-2400 TANK CHORD MEASUREMENTS

PANEL #	1	2	3	4	5	6	7
Chord (ft)		75’ 3.0”	108’ 7.5”	137’ 6.0”	160’ 2.3”	175’ 11.5”	184’ 0.0”
Chord (m)		22.937	33.147	41.908	48.838	53.633	56.084

PANEL #	8	9	10	11	12	13	14	15
Chord (ft)	184’ 0.0”	175’ 11.5”	160’ 2.3”	137’ 6.0”	108’ 7.5”	75’ 3.0”	38’ 5 5/8”	
Chord(m)	56.084	53.633	48.838	41.908	33.147	22.937	11.725	

Schedule- Also refer to Tank Master Assembly Manual and QA/QC Checklist

Project Schedule- 5 Day Timeline

- Main Tanks
  - Mobilization- 3 days
    - Delivery of off-road forklift- same day (required at start of product deliveries)
    - Move tanks from Select yard location to site- 3 days
      - ❖ Move start date TBD
    - Delivery of liners- 1 day
      - ❖ Liner delivery date TBD
- Construction-3 days (provided the absence of inclement weather)
  - Pad Preparation
    - Excavation-Matador to provide excavation
      - ❖ Level tank area with a 0.25% drop towards sump location
      - ❖ Dig Sump and drainage channels
      - ❖ Clear area of large rocks and roll smooth

      (Select can execute excavation at added cost)
  - Tank Installation-5 days for tank crew, 2 days for monitoring systems (overlapping)
    - ❖ Lay Geo felt -1 hour per tank
    - ❖ Lay geotextile -1 hour per tank
    - ❖ Stretch first liner-1 hour per tank
    - ❖ Install LDS - 4 hrs. per tank (2 Hours tank work, 2 Hours setup)
    - ❖ Pull second liner-2 hours per tank
    - ❖ Set Tank Walls- 4 hours per tank
    - ❖ Clamp Liner-1 hour per tank
    - ❖ Set Sump and ladder-1 hour per tank
    - ❖ Add water to tank-Matador to provide water to hold liners in place
- Quality Check/Closeout- 1 day (several crews devoted to different tasks)
  - Electronic Monitoring- 7 hours (Overlapping with other quality checks)
    - ❖ Test level readings- 4 hours
    - ❖ Test connectivity- 1 hour
    - ❖ Quality check walk around-2 hours
  - Tank quality check-16 man hours (two crews 8 hours per crew dedicated to this task)
    - ❖ Check clamps-½ hour per tank
    - ❖ Check grounding-1 hour per tank
    - ❖ Check quality of fitment-½ hour per tank (overlapping with clamp check)
  - Site Cleanliness-14 man hours(dedicated crews assigned to specific tasks)
    - ❖ Remove used material-4 hours (dedicated crew)
    - ❖ Pick up any Garbage-4 hours (dedicated crew)
    - ❖ Stage all equipment for pickup-4 hours (dedicated crew)
    - ❖ Final Walk around-2 hours (project manager and superintendent)

- Delivery/Closing- 6 hours (To be completed at the convenience of Matador)
    - Tour of facility-2 hours
    - Training of site operators-4 hours
    - Address any concerns-TBA
    - Release of any required documentation

Project Turnover Package

Select Energy has always owned and managed its Above Ground Storage tanks and the operations that coincide with them. With that, we have never turned ownership over to another entity, neglecting the need for a formal Project Turnover Package. I have included a brief outline below as to how Select could put together a Project Turnover Package for Matador on this project. Select would be happy to work directly with Matador on a format they deem acceptable.

Outline:

I. Brief description of scope of work
II. Important Contacts List
III. Equipment Specs
IV. AquaView User Guide
V. System Maintenance Agreement
VI. Final Walk Through Checklist
VII. Project Work Contract

Quality Control/Quality Assurance & Inspection Test Plan

Pre-Installation Checklist

- The area where the water storage tank will be placed must be prepared and brought to a state of level that is +/- 12 inches around the circumference of the tank walls.
- Grade and compact tank site with granular soils. Ensure that the grade is level where the tank(s) will be placed. Ensure that there are no sharp edges or rocks within the prepared area. Add 1-2 inches of fine sand cover on top of the compacted granular soils. (Select can execute the prep of the pad at an added cost.) Immediately prior to the delivery of the tanks, install 1 layer 12oz felt geotextile on the tank installation area and secure with sand bags.
- Now establish the exact center of the tank area.
- Mark with spray paint the circumference of the tank (160.7 Ft.)
- Ensure that the tanks have at least 30 feet between adjacent tank walls. This space is required for tank assembly.
- Immediately, prior to delivery of the tank, ensure the following equipment is available:

-One all-terrain, 12K capacity rubber tired articulated crane with an auxiliary winch.

-One all-terrain, rubber tired "man lift" controllable from its platform. The platform to be at least an 8 ft. square with guard rails.

-One 12K fork lift.

- Two 15 foot spreader bars with lift strapping.

- Two 16 foot step ladders.

-One generator

-2 - 200 ft. tape measures.

-Minimum 200 sand bags to assist in windy conditions.

Installation Checklist

- Conduct safety meeting before each day's work to describe the day's activities and discuss potential hazards. Document meeting, any concerns and risk mitigation activities. Fill out a JHA for every different task.
- On the day of tank delivery, ensure 5-6 installation personnel and one crane operator are available to provide labor to install the tanks and, subject to the client's experience with tank and liner installation, supervision of Big Holding Systems' personnel. All personnel should be provided with high visibility vests.
- Unload the following equipment from the tank delivery trucks (per tank):
  -13 tank sections (38.75 feet long X 12 feet high, approximately 6465 lbs, or 2930 kg, per segment). -1 inch diameter bolts and studs, approximately 15 sets per tank segment.
  -2 – 8 inch 150# ANSI "candy cane" design fluid nozzles each c/w support brackets, 8 inch flexible hose, splash plate and butterfly valve.
  -2- 40 mil tank liner, rolled up, suitable for the tank size purchased.
- Always use new bolts for each installation as failure to do so creates an unnecessary risk of joint failure of the assembly.
- CAREFULLY spot the liner in the center of the tank position as marked.
- CAREFULLY unfold the liner until the entire floor has been exposed and matches up with the perimeter line drawn with spray paint.
- CAREFULLY roll the liner back toward its center to provide minimum 15 feet of work space between the floor perimeter and the liner material.
- Adjust the position of each tank section until the bolt holes align on both panels, place the spacer washers on each side of the two tank sections to be bolted together and insert bolts into one side of a set of two sections and then place nut on other end of bolt and hand tighten.
- CAREFULLY unroll the tank liner to the inside edge of the assembled tank. Use 2 of the adjacent liner eyes and ropes with clips and feed the ropes to the man lift. Have one person leave the inside of the tank
- From the man lift, pull the liner wall up and fold the surplus liner over the top of the tank channel. Install the liner clips over the liner and onto the top tank channel spaced approximately 4 feet apart. The liner clips shall be installed with the ½ inch retainer bolt on the outside of the tank wall. As each clip is put in place, install the retainer bolt on the

outside of the tank wall (the clips are designed to be a friction fit for the liner wall and, if properly installed, won't damage the liner). **GENTLY** adjust the liner bottom to the tank wall to eliminate extra tension from the liner wall on the clips. Continue around the perimeter of the tank until the liner is fully installed. **NOTE:** Should a liner clip accidently be dropped inside the tank, this must be immediately examined and reported. The likelihood of damage to the bucket liner is high should this occur, so repair may be required.

- Using the 12K fork lift, CAREFULLY install the "candy cane" nozzle over the lip of the tank and secure into place.

Contractor Scheduling Software- Microsoft Project

Locations

Select Energy Services Permian Operations HQ

Dean Hotelling- Yard Manager

601 S. Pagewood Avenue

Odessa, TX 79761

Select Energy Services- Project Laydown Yard

Cord Rolen- Yard Manager

438 County Road 415

Pecos, TX 79772

Appendix F

Operation Plan

General Specifications

In this plan, the portion of the Produce Water Re-use Rule that is addressed by certain text is underlined. If a conflict exists between any SOP of Select Energy Services and this plan (Appendix F), Select Energy Services will adhere to the mandates of this plan. The operator will maintain and operate the recycling containments and facility in accordance with the following plan to contain liquids and maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment.

- The operator will use the treated produced water in the containments for drilling, completion (stimulation), producing or processing oil or gas or both. If other uses are planned, the operator will notify the OCD though the submission of a modified C-147.
- For all exploration and production operations that use produced water, the operator will conduct these activities in a manner consistent with hydrogen sulfide gas provisions in 19.15.11 NMAC or NORM provisions in 19.15.35 NMAC, as applicable.
- The operator will address all releases from the recycling and re-use of produced water in accordance with 19.15.29 NMAC.
- The operator will not discharge into or store any hazardous waste in the recycling containments but they may hold fluids such was freshwater, brackish water, recycled and treated water, water generated by oil or gas processing facilities, or other waters that are gathered for well drilling or completion. The recycling facility will not be used for the disposal of produced water. The operator will maintain the containments free of miscellaneous solid waste or debris.
- The operator will verify that no oil is on the surface of the contained fluid. If oil is observed, the oil shall be removed using an absorbent boom or other device and properly disposed at an approved facility. An absorbent boom or other device will be maintained on site.
- The operator will install and use a header and diverter described in the design/construction plan in order to prevent damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes during injection or withdrawal of liquids.
- Pursuant to an approved variance, the operator will maintain at least 2-feet of freeboard in each AST containment. For other containments, the operator will maintain at least 3-feet of freeboard. Under extenuating circumstances, which will be noted on the inspection log as described below, the operator may temporarily exceed the freeboard mandate.
- If the liner develops a leak or if any penetration of the liner occurs above the liquid's surface, then the operator will repair the damage or initiate replacement of the liner

within 48 hours of discovery or will seek a variance from the division district office within this time period.

- If visible inspection suggests that the liner developed a leak or if any penetration of the liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours of discovery. The operator will also notify the district division office within this same 48 hours of the discovery and repair the damage or replace the liner.
- In the event of a leak due to a hole in the liner, the following steps will be followed:
    1. If the source of the fluid is uncertain, comparative field tests may need to be performed on both the water in the containment and that which may have been released (e.g. pH, conductance, and chloride).
    2. If the fluid is found to be coming from the containment, determine the location from which the leak is originating.
    3. Mark the point where the water is coming out of the tank.
    4. Locate the puncture or hole in the liner.
    5. Empty the containment to the point of damage in liner.
    6. Clean area of liner that needs to be repaired.
    7. Cut out piece of material (patch or tape) to overlay liner.
    8. Either weld the patch to the injured area in the liner or apply tape over the rupture.
    9. Make sure rupture is completely covered.
    10. Monitor as needed.
- The operator will inspect and remove, as necessary, surface water run-on accumulated in the secondary containment.

Monitoring, Inspections, and Reporting

The containment will contain enough produced water to prevent any shifting of the liner. Weekly inspections shall occur when there is 1-foot depth or more of produced water in the containment. Monthly inspections shall occur when there is less than 1-foot depth of produced water in the containment, as well as when the ASTs are emptied and prior to refilling. An inspection log will be maintained by the operator and will be made available to the division upon request.
Inspection may include: freeboard monitoring, leak detection, identifying potential hazards that may have developed, change in site conditions or if the contents of the containment change from the initial use. The last pages of this Appendix contain the "Inspection Form" to be filled out during these routine inspections.

Monitoring and Inspection Checklist (routine weekly or monthly inspections):

- Visually inspect the liner. If a liner's integrity is compromised, or if any penetration of the liner occurs above or below the water surface, then the operator will notify the appropriate Division district office within 48 hours (phone or email).
- Inspect the system for injection or withdrawal of liquids from the ASTs and document that the design prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes is working appropriately.

- Inspect the water surface for visible oil.
- Measure the freeboard.
- Inspect the secondary containment berm around the ASTs to check for erosion and collection of surface water run-on.
- If H_2S is a documented potential issue with the containment, measure H_2S concentrations on the down-wind side of the facility when produced water is present.
- Inspect the secondary containment for evidence of damage and monitor for leakage.
- Inspect the netting for damage or failure. If netting is jeopardized, repair of the netting shall occur within 48 hours.
- At least monthly, inspect netting for dead wildlife, including migratory birds. Operator shall report the discovery of a dead animal to the appropriate wildlife agency and to the district within 30 days of discovery. Further prevention measures may be required.

If observed conditions indicate a potential tank failure is imminent, the vicinity will be immediately cleared and the AST will be drained.

Recycling Facility

Form C-147 confirms financial assurance of the recycling facility. The operator of the facility is listed on form C-147.

- If the facility shares the same setting in regard to siting criteria, surface ownership, and location of the containments, registration will be submitted for both the containments and facility using one form C-147.
- The recycling facility serves many wells located on the same lease as the facility or on nearby leases.
- The operator of the facility will submit monthly reports to the division district detailing the total volume of water received for recycling, with the amount of fresh water received listed separately, and the total volume of water leaving the facility and its disposition using form C-148.
- The facility operator will keep accurate records that identify the sources and disposition of all recycled water. These records shall be made available to the division by request.

Cessation of Operations

If less than 20% of the total fluid capacity is utilized every six months, beginning from the first withdraw, operation of the facility has ceased and the division district office will be notified. The division district may grant an extension not to exceed six months to determine the cessation of operations. The operator will remove all free fluids from the containments within 60 days from the date of operations cessation. An extension may be requested to allow no more than two months for the removal of fluid.

The operator will remove all fluids from the recycling facility within 60 days of cessation of operations. An extension not be exceed 2 months may be granted by the district division for the removal of fluids from the facility.

Inspection Form

Date: _____

Tiger Recycling Containments and Facility

(weekly inspection when fluids are present, monthly otherwise)

Tank ID: _____

Fluid Level: _____ Tank contents: _____

Inspection Task	Results		Remarks, Observations, and/or Remedial Actions
Visible Oil on Surface	☐ None Observed	☐ Yes, Describe Action	
	An absorbent boom or similar device is located on site to remove visible oil from surface.		
At least 2 ft of freeboard	☐ Yes	☐ No, Measure Freeboard	
Evidence of surface water run-on	☐ None Observed	☐ Yes, Describe	
	Check for excessive erosion of perimeter berms.		
Birds or wildlife in net or screen	☐ None Observed	☐ Yes, Describe	
	Within 30 days of discovery, report dead birds or wildlife to the appropriate agency (USFWS, NMDGF) and to NMOCD District II.		
Damage to netting or screen	☐ None Observed	☐ Yes, Describe	
Rupture of Liner	☐ None Observed	☐ Yes, Describe	
	If rupture is above fluid level, repair within 48 hours. If below fluid level, remove fluid above within 48 hours, notify NMOCD District II, and repair.		
Clips or clamps properly securing liner	☐ Yes	☐ No, Describe	
If low level, enough liner slack on panel wall	☐ Yes	☐ No, Describe	
Uneven gaps between panels	☐ None Observed	☐ Yes, Describe	
Signs of tank settlement	☐ None Observed	☐ Yes, Describe	

Erosion of soil surrounding tank (10 ft radius)	☐ None Observed	☐ Yes, Describe	
Running water on the ground	☐ None Observed	☐ Yes, Describe	
Unusual ponding of fluid inside berm	☐ None Observed	☐ Yes, Describe	
	Field test (pH, Cl-, conductance, etc.) ponded fluid and compare to fluid in tank. If tank is determined as the source, locate and repair rupture within 48 hours. Notify NMOCD District II and repair.		
Rust or corrosion on panels, stairs, or hardware	☐ None Observed	☐ Yes, Describe	
Damage to any hardware	☐ None Observed	☐ Yes, Describe	

Additional Observations or Actions: _____

Inspected by: _____

Appendix G

Closure Plan

The containments are expected to contain a small volume of solids, the majority of which will be windblown sand and dust with some mineral precipitates from the water.

The operator will notify the division district (phone or email) before initiating closure of the containments and/or facility.

Excavation and Removal Closure Plan – Protocols and Procedures

1. Residual fluids in the containments will be sent to disposal at a division-approved facility.
1. The operator will remove all solid contents and transfer those materials to the following division-approved facility: Disposal Facility Name: R360 Permit Number NM 01-0006
2. If possible, geomembrane textiles and liners that exhibit good integrity may be recycled for use as an underliner of tank batteries or other use as approved by OCD.
3. Disassemble the recycling containment infrastructure according to manufacturer's recommendations
4. After the disassemble of the containments and removal of the contents and liners, soils beneath the tanks will be tested as described in the Variance Request attached to this submission
5. From the sample suite described in the Variance Request, we will provide a five-point (minimum) composite from beneath the liner to include any obviously stained or wet soils, or any other evidence of impact from the containments for laboratory analyses for the constituents listed in Table I of 19.15.34.14 NMAC.
6. As the distance between groundwater and the bottom of the containment is less than 50 feet, comparison of sample results to Table I not appropriate. Instead, Matador will excavate and remove to off-site disposal material showing an average concentrations outlined below:
    a. Chloride greater than 600 mg/kg
    b. Benzene greater tham 0.2 mg/kg
    c. Total BTEX greater than 50 mg/kg
    d. TPH greater than 2500 mg/kg
    e. the GRO and DRO combined fraction greater than 500 mg/kg

After such excavation, if necessary, Matador will use non-waste containing, uncontaminated, earthen material to reclaim the surface to pre-existing conditions acceptable to the surface landowner.

Closure Documentation

Within 60 days of closure completion, the operator will submit a closure report (Form C-147) to the District Division, with necessary attachments to document all closure activities are complete, including sampling results and details regarding backfilling and capping as necessary.

In the closure report, the operator will certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the closure plan.

Reclamation and Re-vegetation

The operator will reclaim the surface to safe and stable pre-existing conditions that blends with the surrounding undisturbed area. "Pre-existing conditions" may include a caliche well pad that existed prior to the construction of the recycling containment and that supports active oil and gas operations.

Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion.

For all areas disturbed by the closure process that will not be used for production operations or future drilling, the operator will

1. Replace topsoils and subsoils to their original relative positions
2. Grade so as to achieve erosion control, long-term stability and preservation of surface water flow patterns
3. Reseed in the first favorable growing season following closure

Federal, state trust land, or tribal lands may impose alternate reclamation and re-vegetation obligations that provide equal or better protection of fresh water, human health, and the environment. Re-vegetation and reclamation plans imposed by the surface owner will be outlined in communications with the OCD.

The operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.

The operator will notify the Division when reclamation and re-vegetation is complete.