



August 5, 2019

Mr. Michael Leckie  
Railroad Commission of Texas  
Site Remediation Division  
P.O. Box 12967  
Austin, Texas 78711-2967

Telephone: 512-463-6417  
E-mail: Michael.leckie@rrc.texas.gov

Re: Volume of Impacted Soils Based on Railroad Commission of Texas (RRC) Jurisdictional Lines, Boundary Ventures, Inc., Kenneth Owens Property Facility, Permit No. STF-010, Colorado County, Texas

Dear Mr. Leckie:

As recently requested, Terracon Consultants, Inc. (Terracon) has subdivided the volumes of known and presumed impacted soils at the site. The volumes presented represent a further evaluation of initial estimates first presented in Section 5.0 and Appendix E of *Site Investigation Report, Boundary Ventures, Inc., Kenneth Owens Property Facility, Colorado County, Texas, April 22, 2019*, as well as additional discussion with the RRC and the evaluations of new areas of concern (AOC 10 South and AOC 10 West). It is important to note the new AOCs were not investigated and volumes are based on Google Earth polygon measurements and assumptions of the depth of impacted. It is also important to note that the observations, assumptions, or conclusions presented in this report may change as site conditions change due to the movement of waste by other parties or other factors.

The jurisdictional lines represent Terracon's best evaluation based on available information. Terracon will defer to 16TAC3.30 *Memorandum of Understanding* (MOU) and agency determinations if modifications to jurisdictional boundaries are appropriate and necessary in the future. Jurisdictional boundaries are depicted on enclosed Exhibits 1 and 2 and estimated volumes can be found on Tables 1 and 2.

Significant observations to highlight, according to Terracon's understanding of the site, include:

- AOC 7 contains WG-39 materials which are considered under TCEQ jurisdiction as discussed in Table 2. AOC 7 also contains significant amounts of above and below-grade roadbase;



Terracon Consultants, Inc. 5307 Industrial Oaks Boulevard, Ste. 160 Austin, Texas 78735

P [512] 442-1122 F [512] 442-1181 terracon.com

Geotechnical



Environmental



Construction Materials



Facilities

Volume of Impacted Soils Based on Jurisdiction  
Boundary Ventures, Inc.,  
Colorado County, Texas  
August 5, 2019



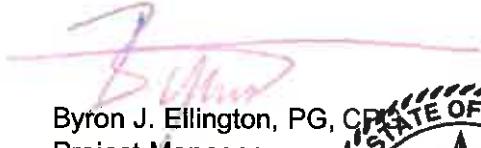
- The water retention pond located in the southeast corner of AOC-2 is assumed to be under TCEQ jurisdiction since it receives run-off from operational areas under TCEQ jurisdiction; and
- The "mixing pit area," which overlaps AOC 8 and AOC 2, appear to be under the jurisdiction of TCEQ. The observation is based on more recent visual evidence of piles of waste that have accumulated since the RRC regulated activities stopped.

We appreciate the opportunity to perform these services for you. Please do not hesitate to contact either of the undersigned if you have questions regarding this project.

Sincerely,

**TERRACON CONSULTANTS, INC.**

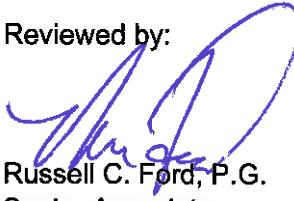
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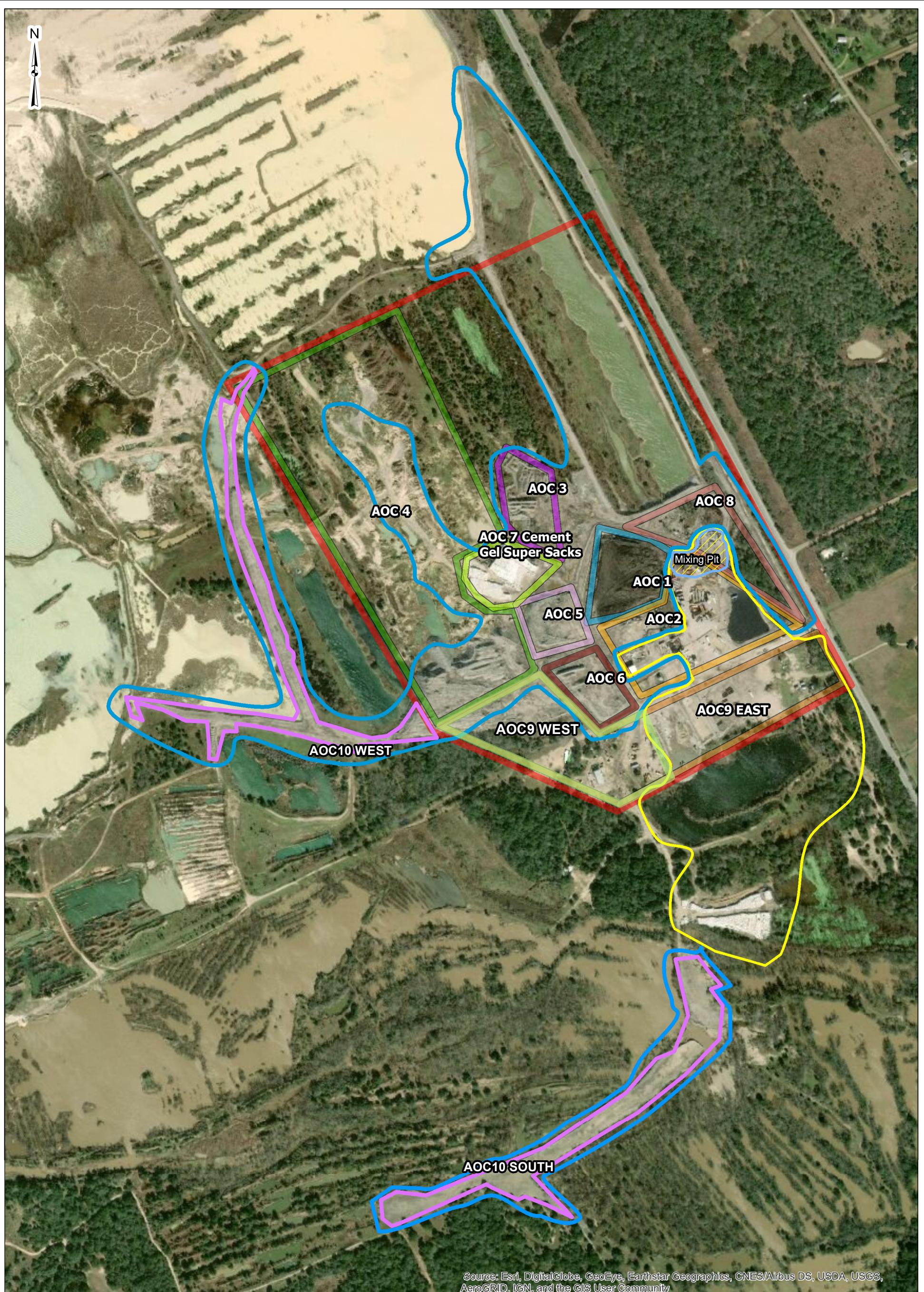
  
Byron J. Ellington, PG, CPI  
Project Manager

Enclosure



Reviewed by:

  
Russell C. Ford, P.G.  
Senior Associate



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

**DATA SOURCES:**  
ESRI WMS - World Aerial Imagery, OpenStreetMap  
Basemap Image Date: 1/22/2017  
The jurisdictional lines represent Terracon's best evaluation based on available information, and do not necessarily reflect a formal determination by RRC staff. Terracon will defer to the MOU Title 16 TAC 3.30 and agency determinations if modifications to jurisdictional boundaries are appropriate and necessary in the future.

0 275 550 1,100 1,650 2,200  
Feet

#### Legend

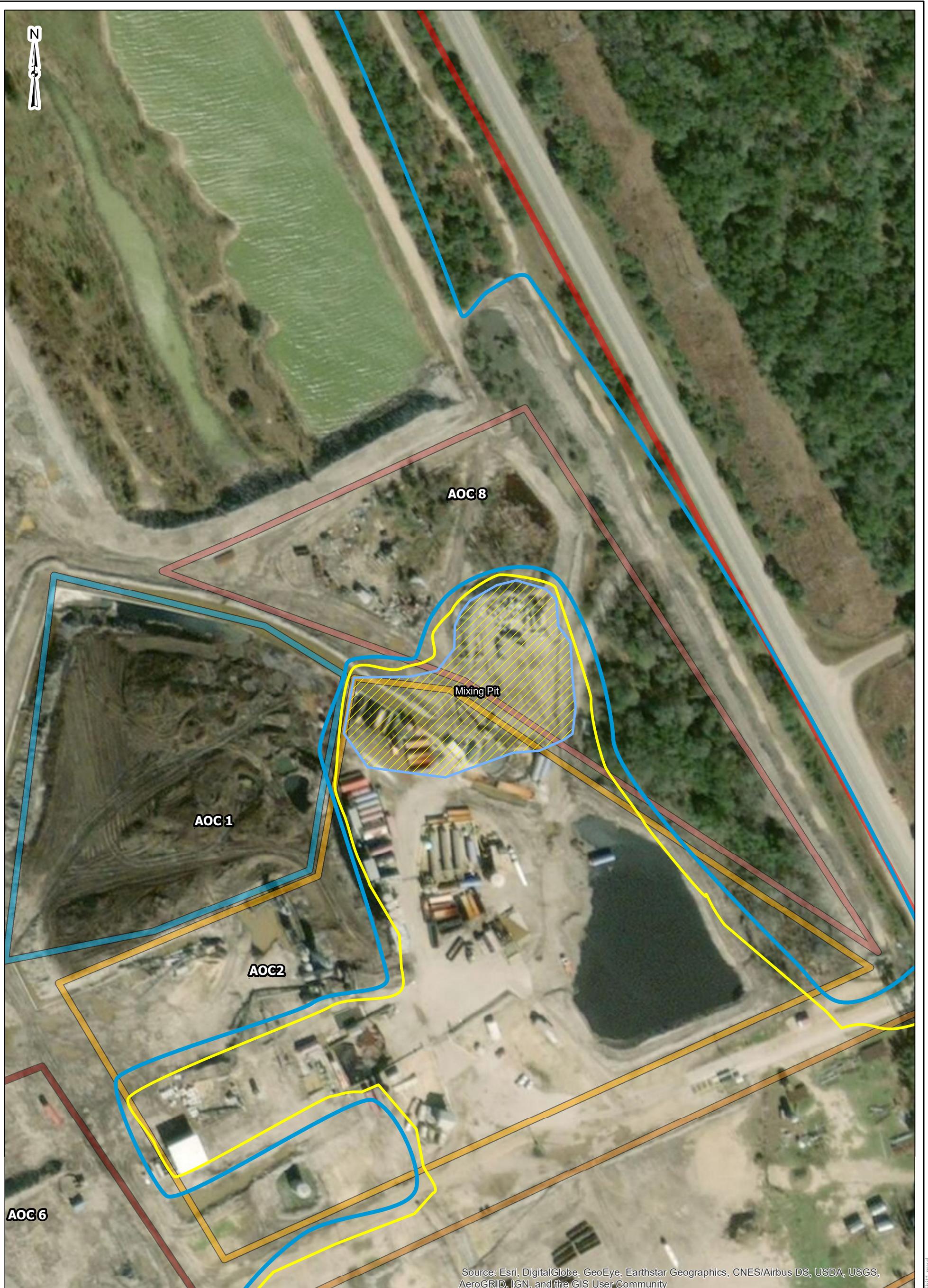
AOC1	AOC9 EAST
AOC2	AOC9 WEST
AOC3	AOC10 WEST
AOC4	AOC10 SOUTH
AOC5	Mixing Pit
AOC6	RRC Jurisdiction
AOC7	TCEQ Jurisdiction
AOC8	Approximate Lease Boundary

Project No.:	96187C01
Date:	Jul 2019
Drawn By:	AR
Reviewed By:	BE



**Jurisdictions and Areas of Concern**  
Boundary Ventures, Inc.  
Kenneth Owens Property Facility  
Altair, Colorado County, Texas

**Exhibit**  
**1**



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

#### Legend

- AOC1
- AOC2
- AOC6
- AOC8
- AOC9 EAST
- Approximate Lease Boundary
- RRC Jurisdiction
- TCEQ Jurisdiction
- / Mixing Pit

DATA SOURCES:  
ESRI WMS - World Aerial Imagery, OpenStreetMap  
Basemap Image Date: 1/22/2017

The jurisdictional lines represent Terracon's best evaluation based on available information, and do not necessarily reflect a formal determination by RRC staff. Terracon will defer to the MOU Title 16 TAC 3.30 and agency determinations if modifications to jurisdictional boundaries are appropriate and necessary in the future.

0 65 130 260 390 520  
Feet

Project No.:	96187C01
Date:	Jul 2019
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Reviewed By:	BE

**Terracon**  
5307 Industrial Oaks Blvd, Suite 160 Austin, TX 78735  
PH. (512) 442-1122 terracon.com

Jurisdictions, AOCs, and Mixing Pit  
Boundary Ventures, Inc.  
Kenneth Owens Property Facility  
Altair, Colorado County, Texas

Exhibit  
2



Project No.	96187C01
Scale:	
Source:	Google Earth 4/2019
Date:	2019

**Terracon**  
Consulting Engineers & Scientists

5307 Industrial Oaks Blvd., Suite 160 Austin Texas 78735  
Phone (512) 42-11224 Fax (512) 442-1181

AOC 7 Supersack Polygons	EXHIBIT
Boundary Ventures, Inc. Kenneth Owens Property Facility Altair, Colorado County, Texas	3

**Table 1**  
**Estimated Volumes of Impacted Soils and Waste, Boundary Ventures, Subdivided by Jurisdiction**  
**Altair, Colorado County, Texas**

August 2019

AOC	Preliminary Estimated Volumes Above Grade			Preliminary Estimated Volumes Below Grade			Comments
	Estimated Surveyed Volumes Above Grade and Exceeding Screening Values <sup>5</sup>	RRC Jurisdiction <sup>4</sup>	TCEQ Jurisdiction <sup>4</sup>	Estimated Volumes Below Grade and Exceeding Screening Values <sup>5</sup>	RRC Jurisdiction <sup>4</sup>	TCEQ Jurisdiction <sup>4</sup>	
	cubic yards	cubic yards	cubic yards	cubic yards	cubic yards	cubic yards	
AOC 1	204,994	204,994	0	86,111	86,111	0	Unprocessed drill cuttings/waste, loose pile.
AOC 2	10,697	2,139	8,558	104,184	20,837	83,347	Except for pit berms, roadbase is primarily buried beneath a compacted driving surface. Pit berms made of roadbase. TCEQ jurisdiction waste likely to be spillage or dumping from chemical totes. The water retention pond located in the southeast corner of AOC-2 is assumed to be under TCEQ jurisdiction since it receives run-off from operational areas under TCEQ jurisdiction. TCEQ jurisdiction estimated volumes includes mixing pile but does not include chemical totes, drums or other containers.
AOC 3	11,039	11,039	0	13,891	13,891	0	Roadbase is in loose piles and buried below grade with some driving surfaces.
AOC 4	21,017	21,017	0	43,078	43,078	0	Roadbase is in loose piles and buried beneath grade, Very limited driving surfaces.
AOC 5	22,761	22,761	0	22,992	22,992	0	Roadbase is primarily loose piles and buried beneath grade, Some driving surfaces.
AOC 6	15,988	15,988	0	27,623	27,623	0	Roadbase is in loose piles and buried beneath grade, Limited driving surfaces.
AOC 7 <sup>8</sup>	7,562	1,862	5,700	24,329	24,329	0	Roadbase is in loose piles and buried beneath grade, Some driving surfaces. WG-39 Supersacks, wood pallets, other hazards. An in place volume of 5,700 cubic yards of WG-39 above grade has been estimated (see Table 2). TCEQ jurisdiction waste assumed to be WG-39 material.
AOC 8	6,373	4,142	2,231	9,573	6,222	3,351	Roadbase is in loose piles (including berms of the mixing pit) and buried beneath grade. Limited driving surfaces. TCEQ jurisdiction estimated volumes includes mixing pile but does not include chemical totes, drums or other containers.
AOC 9 West	386	386	0	72	72	0	Roadbase is primarily buried beneath a compacted driving surface.
AOC 9 East	386	0	386	72	0	72	Roadbase (minor amounts, if present) is primarily buried beneath a compacted driving surface. TCEQ jurisdiction likely to be spillage or dumping from chemical tote.
AOC 10South (South of Skull Creek) <sup>6</sup>	0	0	0	90000	90,000	0	Roadbase is primarily buried beneath a compacted driving surface.
AOC 10West (Roadway west of Lease Boundary) <sup>7</sup>	0	0	0	71481	71,481	0	Roadbase is primarily buried beneath a compacted driving surface.
Total Cubic Yards	301,202	284,328	16,875	493,405	406,636	86,769	

Notes:

1. All volume estimates are preliminary in nature and based on initial evaluations of surveyed piles above grade, google earth AOC polygon area measurements, analytical data and depth interval, PID field readings presented in boring logs, lithological breaks presented in boring logs, and cross-sections.

2. A detailed or a mathematical geospatial analysis has not been performed.

3. Volume estimates are not intended to be used as the basis for an engineering level remedial alternative analysis or a remedial alternative cost estimate.

4. Jurisdiction percentages based on jurisdictional line locations provided by RRC personnel, as well as follow-up discussions with the RRC. Considering the format RRC:TCEQ jurisdiction for AOCs 2, 8, 9 West and 9 East the following percentages were applied, respectively. AOC 2-20%:80%; AOC 8-65%:35%; AOC 9 West-100%:0%; and AOC 9 East-0%:100%. All other AOCs assigned an RRC jurisdiction of 100%.

5. From Table 16, Site Investigation Report, Boundary Ventures, Inc., Kenneth Owens Property Facility, Colorado County, Texas, April 22, 2019.

6. AOC 10South. Terracon's February 2019 site investigation did not include this AOC. Volume estimates are derived from a visual surface area measurements and a reasonable worst case depth estimate of impacted material above screening values (486,000 ft<sup>2</sup> surface area x 5 ft deep x 1.0 exceeding screening value x 1yd<sup>3</sup>/27 ft<sup>3</sup>).

7. AOC 10West. Terracon's February 2019 site investigation did not include this AOC. Volume estimates are derived from a visual surface area measurements and a reasonable worst case depth estimate of impacted material above screening values (386,000 ft<sup>2</sup> surface area x 5 ft deep x 1.0 exceeding screening value x 1yd<sup>3</sup>/27 ft<sup>3</sup>).

8. An in place volume of 5,700 cubic yards of WG-39 above grade has been estimated (see Table 2).



**Table 2<sup>1</sup>**

**Estimated Number of Supersacks and Volume of WG-39 Above  
Grade, Area of Concern No. 7  
Altair, Colorado County, Texas  
August 2019**

Supersack Polygon Number <sup>1</sup>	Area of Polygon <sup>1</sup> FT <sup>2</sup>	Fraction of Polygon Area Covered by Supersacks <sup>1,2</sup>	Corrected Area of Polygon Covered by Supersacks <sup>3</sup> FT <sup>2</sup>	Average Stack Height of Supersacks estimated from Photographs <sup>1</sup>	Estimated Total Volume <sup>4</sup> FT <sup>3</sup>	Estimated Total Volume WG-39 in Polygon <sup>4</sup> YD <sup>3</sup>	Estimated Number of 4'x4'x4' Supersacks in Polygon <sup>4</sup>
1	1,778	0.9	1600	2.25	14,402	533.4	225.0
2	6,682	0.8	5346	2.25	48,110	1781.9	751.7
3	1,431	0.3	429	1.5	2,576	95.4	40.2
4	3,910	0.6	2346	1	9,384	347.6	146.6
5	2,707	0.6	1624	1	6,497	240.6	101.5
6	4,676	0.5	2338	1	9,352	346.4	146.1
7	15,053	0.3	4516	1	18,064	669.0	282.2
8	1,916	0.5	958	1	3,832	141.9	59.9
9	11,151	0.4	4460	1.5	26,762	991.2	418.2
10	471	0.5	236	1.5	1,413	52.3	22.1
11	4,558	0.6	2735	1.1	12,033	445.7	188.0
12	452	0.8	362	1.1	1,591	58.9	24.9
				Totals	154,016	5704.3	2406.5

Notes:

1. Estimates consist of a review of Google Earth images (4/2019), photos taken 5/29/2019 and 6/28/2019, and review of available supersack capacities. Supersacks holding WG-39 are estimated to be approximately 4'x4'x4' and have a base area of 16 square feet and a volume of 64 cubic feet (2.37 cubic yards). A supersack size of 71 or 88 cubic feet (commonly available sizes) and folded closed on top would accommodate this volume and be consistent with site photographs. See Exhibit 3 for identified polygons and photographs taken from AOC 7.
2. Fraction of Polygon Area Covered by Supersacks - a visual coverage of the area covered with Supersacks within each polygon in Google Earth image (4/2019). Values range from 0.3 (30% area covered) to 0.9 (90% area covered).
3. Corrected Area of Polygon Covered by Supersacks = Area of Polygon X Fraction of Polygon Area Covered by Supersacks.
4. Estimated Total Volume WG-39 in Polygon = Corrected Area of Polygon X Estimated Average Stack Height in Polygon X 4 feet (estimated height of each supersack).
5. Estimated Number of Supersacks in Polygon = Estimated Total Volume/Estimated Volume of one full supersack (64 cubic feet; 2.37 cubic yards).



Photo 1— Looking north. View of Polygon Area #2.



Photo 2— Looking west. View of Polygon Area # 4.



Photo 3— Looking west from above AOC 7. View of Polygon Areas 1, 5, 6, 7.



Photo 4— Panoramic view looking west/southwest from above AOC 7. View of all of AOC 7 and Polygon Areas.

