FORM 27 Rev 6/99

#7254

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

RECEIVED 9/4/2012

OGCC Employee:
☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☑ Other (describe): Pit Closure

OGCC Operator Number: 100264
Name of Operator: XTO Energy Inc.
Address: PO Box 6501
City: Englewood State: CO Zip: 80155

Contact Name and Telephone:
Jessica Dooling
No: 970-675-4122
Fax: 970-675-4150

API Number: 05-103-11191-00
County: Rio Blanco
Facility Name: Freedom Unit
Facility Number: Facility # 294702 (Drilling Pit)
Well Name: Freedom Unit
Well Number: FRU 297-8B
Location: (QtrQtr, Sec, Twp, Rng, Meridian): SENW, Sec. 8, T2S, R97W, 6th P.M. Latitude: 39.891485 Longitude: -108.309979

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Drill Cuttings and Fluids

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☑ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Non-Crop Land, Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Rentsac Channery Loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): +/- 4,000' to nearest surface water, nearest water well >1 mile.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
☑ Soils	Arsenic, TPH and Benzene	Laboratory analysis
☐ Vegetation		
☐ Groundwater		
☐ Surface Water		

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

See Attachment I for details regarding initial action taken.

Describe how source is to be removed:

Synthetic liners from all pits have been removed and transported offsite to a permitted disposal/recycling facility. Cuttings Pits 1 and 2 contents have been treated onsite by mix/blending to below Table 910-1 concentration levels.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

NA

Submit Page 2 with Page 1

XTO

FORM 27 Rev 6/99

Page 2

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
(303)894-2100 Fax:(303)894-2109

Tracking Number:
Name of Operator:
OGCC Operator No:
Received Date:
Well Name & No: FRU 297-8
Facility Name & No: Pit # 294702

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Available information indicates that the uppermost groundwater bearing zone is greater than 100 feet below the ground surface. Soil samples were collected for laboratory analysis of subliner material to confirm no groundwater impact potential exists (see Tables 1 through 4).

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Please see Attachment II

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☑ N If yes, describe:

Based on subliner sample results, no additional assessment will be necessary beneath the Freshwater, Reserve, Cuttings Pits 1 and 2 (see Tables 1 through 4).

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Synthetic liners from each of the pits were removed and transported to an approved offsite disposal/recycling facility. Reserve Pit contents were sampled for Table 910-1 and found to be below Table 910-1 concentration levels. Reserve Pit contents were solidified and will be used for on-site fill. Cuttings Pits 1 and 2 contents have been mix/blend processed to below Table 910-1 concentration levels (See Tables 2 and 3). This material will be used for on-site fill.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 1/19/11	Date Site Investigation Completed: in progress	Date Remediation Plan Submitted: 9/4/2012
Remediation Start Date: pending approval	Anticipated Completion Date: pending approval	Actual Completion Date: TBD

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Jessica Dooling Signed:

Title: Environmental Coordinator Date: 9/4/2012

OGCC Approved: Title: FOR Date: 09/05/2012

Chris Canfield
EPS NW Region

ATTACHMENT I

FRU 297-8B Pit Closure Workplan, Form 27 Page 1

Describe initial action taken:

i. The site consists of Freshwater, Reserve and Cuttings Pits 1 and 2 (see Figure 1).

ii. Freshwater Pit contents (de minimis) and associated synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.

iii. Freshwater Pit subliner composite samples were collected and analyzed for Table 910-1 parameters, results were below Table 910-1 concentrations with the exception of pH (9.97) and Arsenic (6.6 mg/kg).

iv. Reserve Pit contents were sampled for Table 910-1 parameters on 1/19/11 and re-sampled on 7/25/11 for TPH and elevated Table 910-1 parameters identified during the initial sampling. Results were below Table 910-1 concentrations with the exception of SAR (32.0), pH (11.82) and Arsenic (4.1 mg/kg).

v. Reserve Pit contents were solidified and will be used onsite for backfill.

vi. Reserve Pit subliner composite samples were collected and analyzed for Table 910-1 parameters, results were below Table 910-1 concentration levels with the exception of pH (10.49) and Arsenic (6.8 mg/kg).

vii. Cuttings Pit 1 content samples were collected and analyzed for Table 910-1 parameters on 1/19/11 and re-sampled on 7/25/11 for elevated Table 910-1 parameters. Results were below Table 910-1 concentration levels with the exception of TPH (1,171 mg/kg), Benzene (0.174 mg/kg), Electrical Conductivity (14.5), SAR (327), pH (11.93) and Arsenic (18.5 mg/kg).

viii. Cuttings Pit 2 pit content samples were collected and analyzed for Table 910-1 parameters on 1/19/11 and re-sampled on 7/25/11 for elevated Table 910-1 parameters. Results were below Table 910-1 concentration levels with the exception of TPH (1,730 mg/kg), Electrical Conductivity (8.34), SAR (172), pH (11.09) and Arsenic (16.3 mg/kg).

ix. Cuttings Pits 1 and 2 contents were mix/blend processed to below Table 910-1 concentration levels (see Tables 2 and 3).

x. Cuttings Pit 1 subliner composite samples were collected and analyzed for Table 910-1 parameters, results were below Table 910-1 concentration levels with the exception of Electrical Conductivity (8.13), SAR (102), pH (10.49) and Arsenic (8.3 mg/kg).

xi. Cuttings Pit #2 subliner composite samples were collected and analyzed for Table 910-1 parameters, results were below Table 910-1 concentration levels with the exception of Electrical Conductivity (7.86), SAR (34.7), pH (10.59) and Arsenic (8.9 mg/kg).

xii. Mix/blend processed Cuttings Pit 1 and 2 materials will be used onsite for backfill.

xiii. All associated Reserve, Cuttings Pits 1 and 2 synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.

xiv. Refer to Tables 1, 2, 3 and 4 for a summary of the laboratory results and Figure 1 for layout of the pits and sample locations.

xv. Elevated Arsenic levels above Table 910-1 concentration were detected beneath the Freshwater, Reserve and Cuttings Pits 1 and 2. Please refer to the associated sundry requesting consideration of background arsenic levels.

ATTACHMENT II

FRU 297-8B Pit Closure Workplan, Form 27 Page 2

REMEDIATION WORKPLAN

Describe Reclamation Plan:

1. **Fresh Water Pit**
   - The pit will be backfilled with mix/blended, native onsite material or material transported to the site.

2. **Reserve Pit**
   - The pit will be backfilled with mix/blended, native onsite material or material transported to the site.

3. **Cuttings Pit 1**
   - The pit will be backfilled with mix/blended, native onsite material or material transported to the site.

4. **Cuttings Pit 2**
   - The pit will be backfilled with mix/blended, native onsite material or material transported to the site.

- Elevated arsenic levels above the Table 910-1 concentration level were detected beneath the Freshwater, Reserve and Cuttings Pits 1 and 2. Please refer to associated sundry requesting consideration of background arsenic levels.

- Please refer to Tables 1 through 4 for a summary of laboratory results, analytical reports are attached.

- Any remaining elevated levels of Electrical Conductivity, SAR and pH detected beneath the pits or in material used for backfill will be covered with a minimum 3 feet of clean, native soils per COGCC guidance. No additional treatment of these soils will be required.

- Material used to fill the top 3 feet of each pit will be found onsite.

- Reclamation activities will be performed in accordance with applicable COGCC 900 and 1000 Series rules and as specified in the Surface use Plan and BLM Conditions of Approval.

Table 1
Location: FRU 297-8B
Lab Summary

Updated: 7/25/2012

Analytical Parameter	Fresh Water Pit		Reserve Pit			Cuttings #1			Cuttings #2			Background 1/26/11					Background 7/3/12						COGCC	Background
(with units)	FW Pit Contents [5] 1/19/11	FW Subliner 6/12/12	Res Pit Contents 1/19/11	Res Pit Contents 7/25/11	Res Pit Subliner 7/2/12	Cut #1 Pit Contents 1/19/11	Cut #1 Pit Contents [6] 7/25/11	Cut #1 Pit Subliner 6/20/12	Cut #2 Pit Contents 1/19/11	Cut #2 Pit Contents [7] 7/25/11	Cut #2 Pit Subliner 6/20/12	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Table 910-1 Concentration Levels	Maximum based on Background
Accutest Job #	D20575	D35489	D20575	D25856	D36105	D20575	D25856	D35710	D20575	D25856	D35708	D20761					D36166							
Sample type (Composite/Discrete)	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)	ND	ND	ND	ND	ND	96.4	131	ND	ND	200	ND	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)	0.7	ND	120	224	26.4	834	1,040	83.9	612	1,530	107	-	-	-	-	-	-	-	-	-	-	-	500	-
TPH (GRO + DRO) (mg/Kg)	0.7	ND	120	224	26.4	930	1,171	83.9	612	1,730	107	-	-	-	-	-	-	-	-	-	-	-	0.170	-
Benzene (mg/Kg)	-	ND	ND	-	ND	0.202	0.174	ND	ND	-	0.0220	-	-	-	-	-	-	-	-	-	-	-	85	-
Toluene (mg/Kg)	-	ND	0.347	-	ND	4.920	-	0.271	0.159	-	0.445	-	-	-	-	-	-	-	-	-	-	-	100	-
Ethylbenzene (mg/Kg)	-	ND	0.154	-	ND	1.190	-	0.0912	0.057	-	0.149	-	-	-	-	-	-	-	-	-	-	-	175	-
Xylenes (total) (mg/Kg)	-	ND	0.539	-	ND	4.232	-	0.398	0.230	-	0.614	-	-	-	-	-	-	-	-	-	-	-	1000	-
Acenaphthene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	1000	-
Anthracene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(A)anthracene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(B)fluoranthene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	2.2	-
Benzo(K)fluoranthene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	0.022	-
Benzo(A)pyrene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	22	-
Chrysene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	0.022	-
Dibenzo(A,H)anthracene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	1000	-
Fluoranthene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	1000	-
Fluorene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Indo(1,2,3,C,D)pyrene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	23	-
Napthalene (mg/Kg)	-	ND	ND	-	ND	0.445	-	0.0549	0.100	-	0.0578	-	-	-	-	-	-	-	-	-	-	-	1000	-
Pyrene (mg/Kg)	-	ND	ND	-	ND	ND	-	ND	ND	-	ND	-	-	-	-	-	-	-	-	-	-	-	1000	-
Electrical Conductivity (mmhos/cm)	0.931	0.492	8.28	2.93	0.412	13.2	14.5	8.130	13.6	8.34	7.860	-	-	-	-	-	-	-	-	-	-	-	<4 or 2X BG	-
Sodium Adsorption Ratio (SAR)	-	8.14	126	32.0	11.1	232	327	102	163	172	34.7	-	-	-	-	-	-	-	-	-	-	-	<12	-
pH	8.56	9.97	11.99	11.82	10.49	11.78	11.93	10.49	12.23	11.09	10.59	-	-	-	-	-	-	-	-	-	-	-	6-9	-
Arsenic (mg/kg)	0.115	6.6	7.3	4.1	6.8	18.6	18.5	8.3	20.1	16.3	8.9	4.6	6.0	5.8	3.8	6.8	4.2	4.4	5.2	5.7	5.3	6.0	0.39	7.5
Approximate Elevation in Feet	-	6433	-	-	6432	-	-	6427	-	-	6428	6497	6501	6501	6485	6503	6453	6444	6438	6428	6423	6412	-	-
Barium (mg/kg)	-	159	11,500	-	596	1,250	-	533	2,220	-	807	-	-	-	-	-	-	-	-	-	-	-	15000	-
Cadmium (mg/kg)	-	<1.1	<3.8	-	<1.0	2.7	-	<1.1	<1.3	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	70	-
Chromium (III) (mg/Kg)	-	41.1	15.5	-	40.2	18.2	-	36.3	18.0	-	36.5	-	-	-	-	-	-	-	-	-	-	-	120000	-
Chromium (VI) (mg/Kg)	-	<1.0	2.3	-	<1.0	<0.49	-	<1.0	<0.50	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	23	-
Copper (mg/kg)	-	7.2	37.9	-	7.8	29.3	-	13.1	27.3	-	11.3	-	-	-	-	-	-	-	-	-	-	-	3100	-
Lead (inorganic) (mg/kg)	-	10.9	26.2	-	11.7	21.2	-	12.2	33.5	-	11.5	-	-	-	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	-	<0.11	<0.37	-	<0.11	<0.12	-	<0.11	<0.11	-	<0.10	-	-	-	-	-	-	-	-	-	-	-	23	-
Nickel (mg/kg)	-	14.6	15.5	-	13.3	16.6	-	16.3	16.8	-	15.4	-	-	-	-	-	-	-	-	-	-	-	1600	-
Selenium (mg/kg)	-	<5.7	<19	-	<5.0	11.4	-	<5.4	<6.5	-	<5.1	-	-	-	-	-	-	-	-	-	-	-	390	-
Silver (mg/kg)	-	<3.4	<12	-	<3.0	<3.8	-	<3.3	<3.9	-	<3.1	-	-	-	-	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	-	39.5	72.2	-	39.0	50.0	-	46.5	53.4	-	44.2	-	-	-	-	-	-	-	-	-	-	-	23000	-
% Solids	n/a	89.7	26.3	58.6	94.5	79.3	79.2	92.1	77.9	79.6	95.0	82.2	86.7	84.1	71.6	85.1	98.3	99.1	98.5	98.2	98.2	98.7	-	-

Notes:
1) ND = not detectible to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.
4) See site map for sample locations.
5) FW pit only contained water (< 1') that was sampled for limited Table 910 constituents. De minimis to no pit content was encountered.
6) See Table 2 for mix/blend results.
7) See Table 3 for mix/blend results.

Table 2
Location: FRU 297-8B
Lab Summary - Cuttings #1 Mix/Blend

Updated: 7/25/2012

Analytical Parameter	Cuttings #1										COGCC	Background
(with units)	*Cut #1 Pit Contents Comp 1/19/11*	*Cut #1 Pit Contents Comp 7/25/11*	*Cut #1 MixBlend Trial 1:1 4/12/12*	*Cut #1 MixBlend Trial 2:1 4/12/12*	*Cut #1 MixBlend Day 1 (6/7) 6/11/12*	*Cut #1 MixBlend Day 2 (6/11) 6/12/12*	*Cut #1 MixBlend Day 3 (6/12) 6/13/12*	*Cut #1 MixBlend Day 4 (6/13) 6/13/12*	*Cut #1 MixBlend Day 5 (6/14) 6/18/12*	*Cut #1 MixBlend Day 6 (6/18) 6/20/12*	*Table 910-1 Concentration Levels*	*Maximum based on Background*
Accutest Job #	*D20575*	*D25856*	*D33672*		*D35344*	*D35485*	*D35547*		*D35617*	*D35709*	-	-
Sample type (Composite/Discrete)	*C*	*C*	*C*	*C*	*C*	*C*	*C*	*C*	*C*	*C*	-	-
TPH (GRO) (mg/Kg)	96.4	131	6.59	8.77	63.2	8.61	72.8	77.4	27.6	9.05	-	-
TPH (DRO) (mg/Kg)	834	1,040	253	463	256	171	179	159	243	124	-	-
TPH (GRO + DRO) (mg/Kg)	930	1,171	260	472	319	180	252	236	271	133	500	-
Benzene (mg/Kg)	0.202	0.174	ND	ND	0.0375	ND	ND	ND	ND	0.0247	0.170	-
Toluene (mg/Kg)	4.920	-	-	-	-	-	-	-	-	-	85	-
Ethylbenzene (mg/Kg)	1.190	-	-	-	-	-	-	-	-	-	100	-
Xylenes (total) (mg/Kg)	4.232	-	-	-	-	-	-	-	-	-	175	-
Acenaphthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	1000	-
Anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(B)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	2.2	-
Benzo(A)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	0.022	-
Chrysene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	22	-
Dibenzo(A,H)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	0.022	-
Fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	1000	-
Fluorene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	1000	-
Indo(1,2,3,C,D)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	0.22	-
Napthalene (mg/Kg)	0.445	-	-	-	-	-	-	-	-	-	23	-
Pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	1000	-
Electrical Conductivity (mmhos/cm)	13.2	14.5	-	-	-	-	-	-	-	-	<4 or 2X BG	-
Sodium Adsorption Ratio (SAR)	232	327	-	-	-	-	-	-	-	-	<12	-
pH	11.78	11.93	-	-	-	-	-	-	-	-	6-9	-
Arsenic (mg/kg)	18.6	18.5	-	-	-	-	-	-	-	-	0.39	7.5
Barium (mg/kg)	1,250	-	-	-	-	-	-	-	-	-	15000	-
Cadmium (mg/kg)	2.7	-	-	-	-	-	-	-	-	-	70	-
Chromium (III) (mg/Kg)	18.2	-	-	-	-	-	-	-	-	-	120000	-
Chromium (VI) (mg/Kg)	<0.49	-	-	-	-	-	-	-	-	-	23	-
Copper (mg/kg)	29.3	-	-	-	-	-	-	-	-	-	3100	-
Lead (inorganic) (mg/kg)	21.2	-	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	<0.12	-	-	-	-	-	-	-	-	-	23	-
Nickel (mg/kg)	16.6	-	-	-	-	-	-	-	-	-	1600	-
Selenium (mg/kg)	11.4	-	-	-	-	-	-	-	-	-	390	-
Silver (mg/kg)	<3.8	-	-	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	50.0	-	-	-	-	-	-	-	-	-	23000	-
% Solids	79.3	79.2	89.9	87.6	87.3	89.2	85.6	88.9	88.7	89.2	-	-

Notes:
1) ND = not detectible to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 Concentration levels. Results highlighted in gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.

Table 3
Location: FRU 297-8B
Lab Summary - Cuttings #2 Mix/Blend

Updated: 7/25/2012

Analytical Parameter	Cuttings #2								COGCC	Background
(with units)	Cut #2 Pit Contents Comp 1/19/11	Cut #2 Pit Contents Comp 7/25/11	Cut #2 MixBlend Trial 1:1 4/12/12	Cut #2 MixBlend Trial 2:1 4/12/12	Cut #2 MixBlend Day 1 (5/23) 5/25/12	Cut #2 MixBlend Day 2 (5/24) 5/25/12	Cut #2 MixBlend Day 3 (5/29) 5/30/12	Cut #2 MixBlend Day 4 (6/6) 6/7/12	Table 910-1 Concentration Levels	Maximum based on Background
Accutest Job #	D20575	D25856	D33672		D34861		D34958	D35287	-	-
Sample type (Composite/Discrete)	C	C	C	C	C	C	C	C	-	-
TPH (GRO) (mg/Kg)	ND	200	12.7	ND	65.1	53.6	21.6	ND	-	-
TPH (DRO) (mg/Kg)	612	1,530	211	395	196	344	326	127	-	-
TPH (GRO + DRO) (mg/Kg)	612	1,730	224	395	261	398	348	127	500	-
Benzene (mg/Kg)	ND	-	-	-	-	-	-	-	0.170	-
Toluene (mg/Kg)	0.159	-	-	-	-	-	-	-	85	-
Ethylbenzene (mg/Kg)	0.057	-	-	-	-	-	-	-	100	-
Xylenes (total) (mg/Kg)	0.230	-	-	-	-	-	-	-	175	-
Acenaphthene (mg/Kg)	ND	-	-	-	-	-	-	-	1000	-
Anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	0.22	-
Benzo(B)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	2.2	-
Benzo(A)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	0.022	-
Chrysene (mg/Kg)	ND	-	-	-	-	-	-	-	22	-
Dibenzo(A,H)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	0.022	-
Fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	1000	-
Fluorene (mg/Kg)	ND	-	-	-	-	-	-	-	1000	-
Indo(1,2,3,C,D)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	0.22	-
Napthalene (mg/Kg)	0.100	-	-	-	-	-	-	-	23	-
Pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	1000	-
Electrical Conductivity (mmhos/cm)	13.6	8.34	-	-	-	-	-	-	<4 or 2X BG	-
Sodium Adsorption Ratio (SAR)	163	172	-	-	-	-	-	-	<12	-
pH	12.23	11.09	-	-	-	-	-	-	6-9	-
Arsenic (mg/kg)	20.1	16.3	-	-	-	-	-	-	0.39	7.5
Barium (mg/kg)	2,220	-	-	-	-	-	-	-	15000	-
Cadmium (mg/kg)	<1.3	-	-	-	-	-	-	-	70	-
Chromium (III) (mg/Kg)	18.0	-	-	-	-	-	-	-	120000	-
Chromium (VI) (mg/Kg)	<0.50	-	-	-	-	-	-	-	23	-
Copper (mg/kg)	27.3	-	-	-	-	-	-	-	3100	-
Lead (inorganic) (mg/kg)	33.5	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	<0.11	-	-	-	-	-	-	-	23	-
Nickel (mg/kg)	16.8	-	-	-	-	-	-	-	1600	-
Selenium (mg/kg)	<6.5	-	-	-	-	-	-	-	390	-
Silver (mg/kg)	<3.9	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	53.4	-	-	-	-	-	-	-	23000	-
% Solids	77.9	79.6	87.0	86.0	87.0	85.9	86.3	90.4	-	-

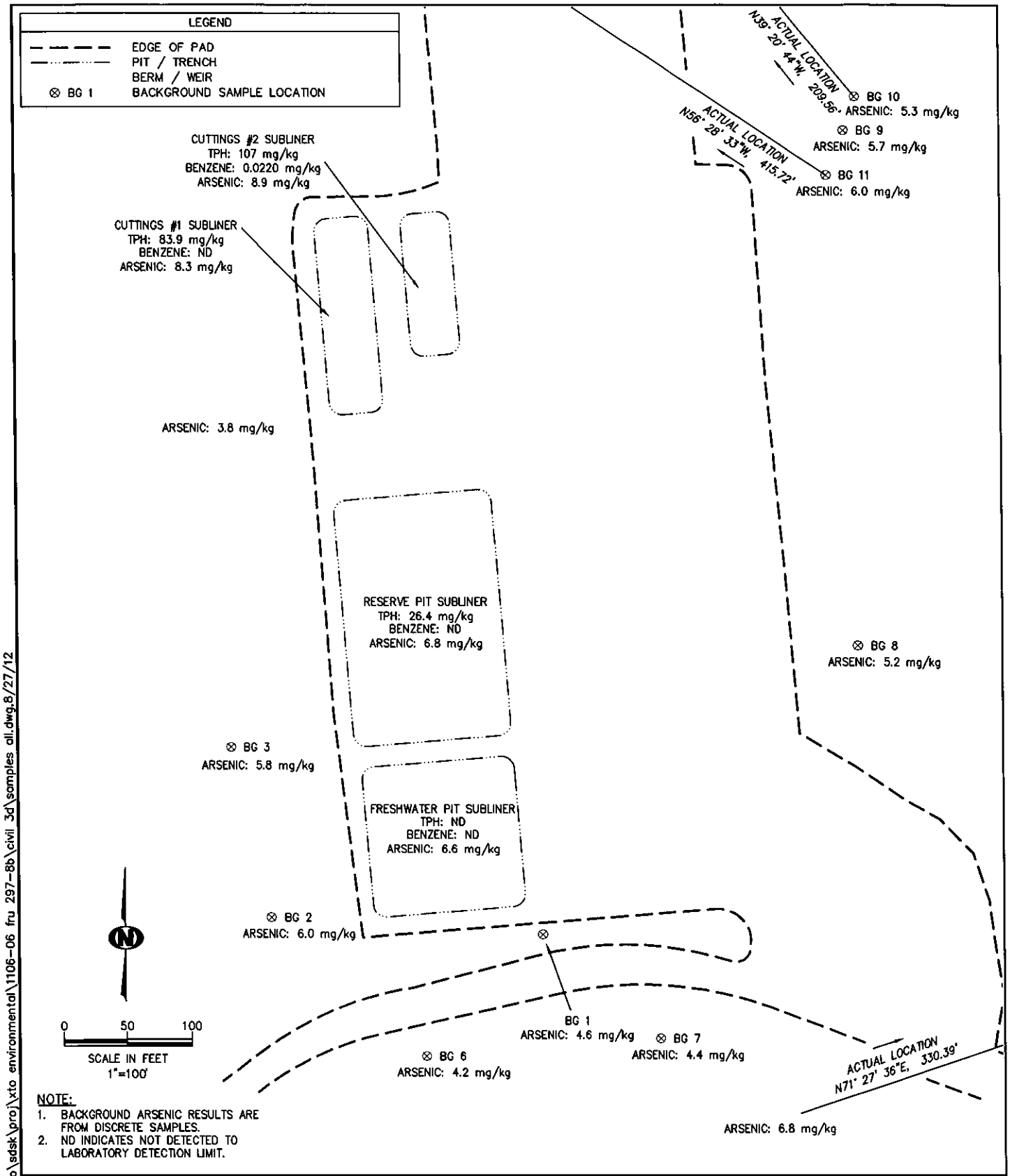
Notes:
1) ND = not detectible to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 Concentration levels. Results highlighted in gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.

Table 4
Location: FRU 297-8B
Lab Summary - Arsenic Summary

Updated: 7/25/2012

Analytical Parameter	Cuttings #1						Cuttings #1 and #2 [4]							Background 1/26/11					Background 7/3/12						COGCC	Maximum based on Background
(with units)	Cut #1 Pit Contents 1/19/11	Cut #1 Pit Contents 7/25/11	Cut #1 Discrete #1 6/28/12	Cut #1 Discrete #2 6/28/12	Cut #1 Discrete #3 6/28/12	Cut #1 Discrete #4 6/28/12	Cut #2 Pit Contents 1/19/11	Cut #2 Pit Contents 7/25/11	Cut #1 & #2 Discrete #1 6/28/12	Cut #1 & #2 Discrete #2 6/28/12	Cut #1 & #2 Discrete #3 6/28/12	Cut #1 & #2 Discrete #4 6/28/12	Cut #1 & #2 Discrete #5 6/28/12	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	Table 910-1 Concentration Levels	
Accutest Job #	D20575	D25856	D36015				D20575	D25856	D36015					D20761					D36166						-	-
Sample type (Composite/Discrete)	C	C	D	D	D	D	C	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)	96.4	131	-	-	-	-	ND	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)	834	1,040	-	-	-	-	612	1,530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)	930	1,171	-	-	-	-	612	1,730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene (mg/Kg)	0.202	0.174	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene (mg/Kg)	4.920	-	-	-	-	-	0.159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene (mg/Kg)	1.190	-	-	-	-	-	0.057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes (total) (mg/Kg)	4.232	-	-	-	-	-	0.230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(A)anthracene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(B)fluoranthene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(K)fluoranthene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(A)pyrene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(A,H)anthracene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indo(1,2,3,C,D)pyrene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Napthalene (mg/Kg)	0.445	-	-	-	-	-	0.100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene (mg/Kg)	ND	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (mmhos/cm)	13.2	14.5	-	-	-	-	13.6	8.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	232	327	-	-	-	-	163	172	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	11.78	11.93	-	-	-	-	12.23	11.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (mg/kg)	18.6	18.5	11.8	11.3	12.3	8.8	20.1	16.3	9.8	7.7	8.8	9.9	9.9	4.6	6.0	5.8	3.8	6.8	4.2	4.4	5.2	5.7	5.3	6.0	0.39	7.5
Approximate Elevation in Feet	-	-	-	-	-	-	-	-	-	-	-	-	-	6497	6501	6501	6485	6503	6453	6444	6438	6428	6423	6412	-	-
Barium (mg/kg)	1,250	-	-	-	-	-	2,220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium (mg/kg)	2.7	-	-	-	-	-	<1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (III) (mg/Kg)	18.2	-	-	-	-	-	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (VI) (mg/Kg)	<0.49	-	-	-	-	-	<0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (mg/kg)	29.3	-	-	-	-	-	27.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (inorganic) (mg/kg)	21.2	-	-	-	-	-	33.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (mg/kg)	<0.12	-	-	-	-	-	<0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (mg/kg)	16.6	-	-	-	-	-	16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium (mg/kg)	11.4	-	-	-	-	-	<6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (mg/kg)	<3.8	-	-	-	-	-	<3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (mg/kg)	50.0	-	-	-	-	-	53.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Solids	79.3	79.2	94.7	99.1	99.0	93.2	77.9	79.6	93.6	93.9	88.2	88.5	94.5	82.2	86.7	84.1	71.6	85.1	98.3	99.1	98.5	98.2	98.2	98.7	-	-

Notes:
1) ND = not detectible to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 Concentration levels. Results highlighted in gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.
4) Cuttings #2 was mixed with Cuttings #1 mix/blended material prior to the sampling on 6/28/12.



NOTE:
1. BACKGROUND ARSENIC RESULTS ARE FROM DISCRETE SAMPLES.
2. ND INDICATES NOT DETECTED TO LABORATORY DETECTION LIMIT.

DESIGNED: BB	CHECKED: BB	FIGURE 1	NOTES:
DATE: 8/27/12	DRAWN: DRF		
FILE NAME: samples all		SHEET NO. 1 of 1	DATE / REVISIONS
PROJECT NO. 1106-06		SCALE: 1"=100'	

KRW CONSULTING, INC.
8000 W. 14TH AVENUE, SUITE 200
LAKEWOOD, COLORADO
(303) 239-9011

FIGURE 1
PICEANCE CREEK
FRU 297-8B
SAMPLE LOCATIONS WITH ARSENIC LEVELS
PREPARED FOR XTO ENERGY

\\hyper-v03\lkwd-co\sdsk\pro\xto environmental\1106-06 fru 297-8b\civil 3d\samples all.dwg,8/27/12