

State of Colorado
Oil and Gas Conservation Commission

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



#7466

FOR OGCC USE ONLY

RECEIVED
12/3/2012

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: 05-103-10441-00

County: Rio Blanco

Facility Name: Piceance Creek Unit

Facility Number: Drilling Pits #272560 and 272879

Well Name: Piceance Creek Unit

Well Number: T78X-12G

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SESE, Sec. 12, T2S, R97W, 6th P.M.

Latitude: 39.8849

Longitude: -108.22245

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: Yamac loam, 2-15%

Potential receptors (water wells within 1/4 mi, surface waters, etc.): water wells > 1.0 miles; Hatch Gulch Diversion Spring - approx. 2000 ft.

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

Impacted Media (check):



Soils



Vegetation



Groundwater



Surface Water

Extent of Impact:

Arsenic, TPH and Benzene

How Determined:

laboratory analysis

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 will be transported offsite to a permitted disposal/recycling facility. Cuttings Pits #1 and #2 contents will be treated onsite with a temporary Thermal Desorption Unit, by mix/blend processing or transported offsite to a permitted disposal/recycling facility.

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.:

Any remaining impacted soils will either be treated onsite or removed to a permitted disposal/recycling facility.

FORM
27
Rev 6/99State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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Page 2

REMEDATION WORKPLAN (Cont.)

Tracking Number: _____

Name of Operator: _____

OGCC Operator No: X T OReceived Date: Location ID# 335878Well Name & No: API # 103-10441Facility Name & No: Pit # 272560 & 272879

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 150 feet below the ground surface. Soil samples were collected for laboratory analysis of subliner material to confirm no groundwater impact potential exists (see Table 1).

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 Table 1).

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 will be transported offsite to an approved disposal/recycling facility. Cuttings Pits #1 and #2 contents will either be treated onsite with a temporary Thermal Desorption Unit, mix/blend processed to below Table 910-1 concentration levels, or transported offsite to an approved disposal/recycling facility. Material mix/blend and/or Thermal Desorption Unit processed will be used for on-site fill.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 8/28/12Date Site Investigation Completed: In progressDate Remediation Plan Submitted: 12/3/2012Remediation Start Date: pending approvalAnticipated Completion Date: pending approvalActual 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 CoordinatorDate: 12/3/2012

OGCC Approved: _____

Title FOR Chris Camfield Date 12/18/2012EPS NW Region

ATTACHMENT I

PCU T78X-12G 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 will be transported to an offsite permitted disposal/recycling facility.
- iii. The Freshwater Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for EC (8.52), SAR (12.9), pH (9.08) and Arsenic (4.7 mg/kg).
- iv. The Reserve Pit contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for EC (12.1), pH (12.53) and Arsenic (10.2 mg/kg).
- v. Reserve Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.73) and Arsenic (6.6 mg/kg).
- vi. Cuttings Pit #1 contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for Benzene (0.744 mg/kg), EC (8.560), SAR (14.7), pH (12.49) and Arsenic (10.9 mg/kg).
- vii. Cuttings Pit #2 contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (601 mg/kg), Benzene (0.419 mg/kg), EC (13.5), SAR (62.7), pH (12.35) and Arsenic (14.2 mg/kg).
- viii. Cuttings Pits #1 and #2 contents were removed from the respective pits and will be treated on-site with a temporary Thermal Desorption Unit or mix/blend processing (with confirmation samples to ensure Table 910 compliance) or disposed of offsite.

- ix. Cuttings Pit #1 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.65) and Arsenic (6.8 mg/kg).
- x. Cuttings Pit #2 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.58) and Arsenic (6.5 mg/kg).
- xi. Mix/blend and/or Thermal Desorption Unit processed Cuttings Pits #1 and #2 material that meets Table 910-1 concentration levels will be used onsite for backfill.
- xii. All associated Reserve, Cuttings Pits #1 and #2 synthetic liners were removed and will be transported to an offsite permitted disposal/recycling facility.
- xiii. Refer to Table 1 for a summary of the laboratory results and Figure 1 for layout of the pits and sample locations.
- xiv. 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

PCU T78X-12G Pit Closure Workplan, Form 27 Page 2

REMEDIATION WORKPLAN

Describe Reclamation Plan:

1. Fresh Water Pit

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

2. Reserve Pit

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

3. Cuttings Pit #1

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

4. Cuttings Pit #2

- The pit will be backfilled with Thermal Desorption Unit processed, 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 Table 1 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, as specified in the Surface use Plan and BLM Conditions of Approval.

Table 1
Location: PCU T78X-12G
Lab Summary

Analytical Parameter (with units)	Fresh Water Pit		Reserve Pit		Cuttings #1		Cuttings #2		Background (8/28/12)								Last update	10/19/2012
	FW Pit Contents	FW Pit Subliner 9/10/12	RP Post Solid, 9/18/12	RP Subliner 9/18/12	Cut #1 Post Solid, 9/6/12	Cut #1 Subliner 9/7/12	Cut #2 Post Solid, 9/6/12	Cut #2 Subliner 9/7/12	CG-1	CG-2	CG-3	CG-4	CG-5	CG-6	CG-7	CG-8		
Accutest Job #	D38644	D38940	D38939	D38518	D38599	D38605	D38605	D38605	D38124	D38124	D38124	D38124	D38124	D38124	D38124	D38124	COGCC	Maximum based on Background
Sample type (Composite/Discrete)	C	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)	141	301	29.9	310	32.4	32.4	523	18.4	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)	141	301	29.9	357	32.4	32.4	601	18.4	-	-	-	-	-	-	-	-	-	-
Benzene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	500	-
Toluene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.170	-
Ethylbenzene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	85	-
Xylenes (total) (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	100	-
Acenaphthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	175	-
Anthracene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Benzo(B)fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Benzo(A)pyrene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	2.2	-
Chrysene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.022	-
Dibenz(A,H)anthracene (mg/Kg)	0.0076	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	22	-
Fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.022	-
Fluorene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Indeno(1,2,3-C,D)pyrene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Naphthalene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Pyrene (mg/Kg)	0.0248	0.0354	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	23	-
Electrical Conductivity (mmhos/cm)	8.52	12.100	0.835	8.560	0.851	13.500	0.477	0.477	-	-	-	-	-	-	-	-	1000	-
Sodium Adsorption Ratio (SAR)	12.9	6.94	5.56	14.7	5.35	62.7	2.89	2.89	-	-	-	-	-	-	-	-	4	-
pH	9.08	12.53	9.73	12.49	9.65	12.35	9.58	9.58	-	-	-	-	-	-	-	-	12	-
Arsenic (mg/kg)	4.7	10.2	6.6	10.9	6.8	14.2	6.5	6.5	-	-	-	-	-	-	-	-	6.9	-
Barium (mg/kg)	1780	4220	914	2020	1340	2100	1530	1530	-	-	-	-	-	-	-	-	0.39	6.9
Cadmium (mg/kg)	<1.2	<1.6	<1.1	<1.2	<1.2	<1.2	<1.2	<1.2	-	-	-	-	-	-	-	-	15000	-
Chromium (III) (mg/Kg)	39.3	<22	41.4	12.1	49.1	56.2	56.2	56.2	-	-	-	-	-	-	-	-	70	-
Chromium (VI) (mg/Kg)	<1.0	<20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	120000	-
Copper (mg/kg)	15.7	18.2	10.3	28.2	11.4	31.6	10.3	10.3	-	-	-	-	-	-	-	-	3100	-
Lead (Inorganic) (mg/Kg)	15.5	19.8	11.1	20.4	12.8	15.5	12.6	12.6	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	<0.12	<0.16	<0.11	<0.12	<0.11	<0.12	<0.11	<0.11	-	-	-	-	-	-	-	-	23	-
Nickel (mg/kg)	19.6	130	18.5	85.9	19.5	52.8	19.6	19.6	-	-	-	-	-	-	-	-	1600	-
Selenium (mg/kg)	<6.2	<7.9	<5.4	<6.0	<5.9	<6.1	<5.8	<5.8	-	-	-	-	-	-	-	-	390	-
Silver (mg/kg)	<3.7	<4.7	<3.3	<3.6	<3.5	<3.7	<3.5	<3.5	-	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	50.1	54.3	39.2	40.5	47.1	49.4	46.2	46.2	-	-	-	-	-	-	-	-	23000	-
% Solids	82.7	62.8	92.8	81.3	86.4	79.9	85.6	85.6	-	-	-	-	-	-	-	-	-	-

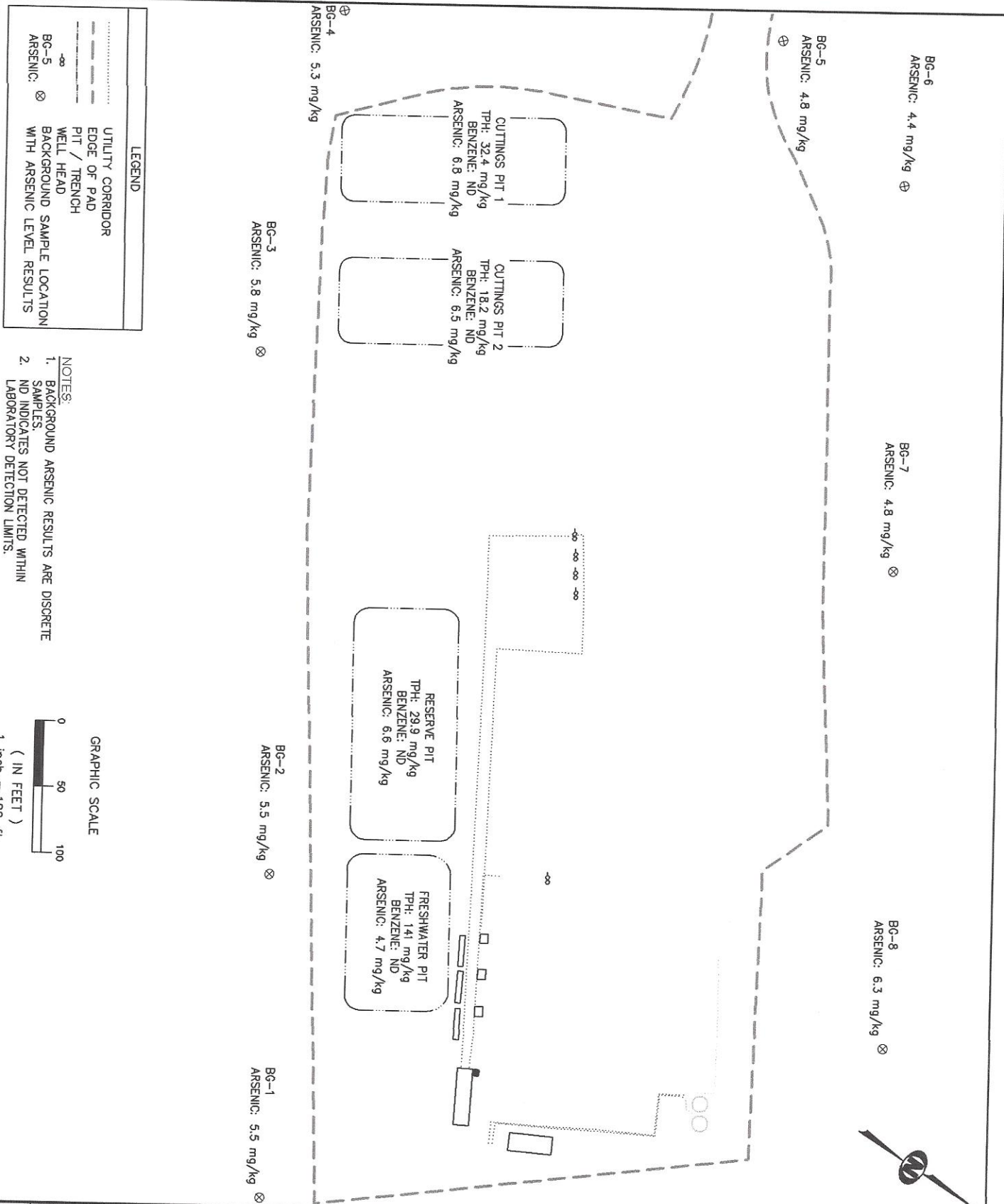
Notes:
1) ND = not detectable to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.
4) See site map for sample locations.

Table 2
Location: PCU T78X-12G
Lab Summary - Arsenic Summary

Analytical Parameter (with units)	Reserve Pit Discrete Arsenic					Cuttings #1 Discrete Arsenic					Cuttings #2 Discrete Arsenic					Background (8/28/12)								Last update	Maximum based on Background
	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5	BG-1	BG-2	BG-3	BG-4	BG-5	BG-6	BG-7	BG-8	COGCC Table 910-1 Concentration Levels	
Accutest Job #	D40650 (11/5/12)					D40648 (11/6/12)					D40649 (11/6/12)					D38124									
Sample type (Composite/Discrete)	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	-
Toluene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.170	-
Ethylbenzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	-
Xylenes (total) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-
Acenaphthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175	-
Anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-
Benzo(B)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(A)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	-
Chrysene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-
Dibenzo(A,H)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-
Fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-
Indeno(1,2,3-C,D)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-
Naphthalene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-
Pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-
Electrical Conductivity (mmhos/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-
Sodium Adsorption Ratio (SAR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	-
pH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
Arsenic (mg/kg)	6.7	7.3	6.3	7.4	6.4	12.5	9.8	16.4	9.0	8.6	13.2	14.2	12.6	12.4	9.0	5.5	5.5	5.8	5.3	4.8	4.4	4.8	6.3	6-9	-
Barium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.39	6.9
Cadmium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000	-
Chromium (III) (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-
Chromium (VI) (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120000	-
Copper (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-
Lead (inorganic) (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3100	-
Nickel (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-
Selenium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600	-
Silver (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	-
% Solids	65.3	63.8	66.2	66.9	65.6	93.0	97.8	96.5	96.6	94.9	92.3	93.5	96.7	89.6	85.2	93.4	96.9	94.8	95.5	95.5	96.0	95.9	95.6	23000	-

Notes:

- 1) ND = not detectable 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.



DESIGNED: 1	CHECKED: DK	FIGURE 1	NOTES:		DATE	REVISIONS	KRW CONSULTING, INC. 8000 W. 14TH AVENUE, SUITE 200 LAKEWOOD, COLORADO (303) 239-9011	FIGURE 1 PICEANCE CREEK PCU T78X-12G SAMPLE LOCATIONS WITH BACKGROUND ARSENIC PREPARED FOR XTO ENERGY
DATE: 11/12/12	DRAWN: DRF							
FILE NAME: Somp		SHEET NO. 1 of 1						
PROJECT NO. 1007-06		SCALE: 1"=100'						