FORM
27
Rev 6/99

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 8/21/14
REM #7820
Doc #1733935

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):

OGCC Operator Number: 66571
Name of Operator: OXY USA WTP LP
Address: 760 Horizon Drive, Suite 101
City: Grand Junction State: CO Zip: 81506

Contact Name and Telephone:
Chris Clark
No: 970.263.3607
Fax: 970.263.3694

API Number:
County: Garfield
Facility Name: 705-22-43 Well Pad
Facility Number: 335186
Well Name: N/A
Well Number: N/A
Location: (QtrQtr, Sec, Twp, Rng, Meridian): SENW, Sec 5, T7S, R97W, 6th PM Latitude: 39.477643 Longitude: -108.243555

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced Water and Condensate

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.): Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Happle-Rock outcrop association, 25-65% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): nearest water well is ~970' southwest, nearest surface water is ~1238' to the west, depth to the shallowest groundwater is ~100'.

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

Impacted Media (check):	Extent of Impact:	How Determined:
☑ Soils	See Report	Visual, lab results
☐ Vegetation	N/A	Visual
☐ Groundwater	N/A	Lab results
☐ Surface Water	N/A	Lab results

REMEDIATION WORKPLAN

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

See attached report.

Describe how source is to be removed:

See attached report.

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.:

See attached report.

Submit Page 2 with Page 1

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: _____
Facility Name & No: _____

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

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

See attached report.

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.

See attached report.

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:

See attached report.

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

See attached report.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: January 11, 2013 Date Site Investigation Completed: Spring 2014 Date Remediation Plan Submitted: Pending

Remediation Start Date: August 2014 Anticipated Completion Date: August 2015 Actual Completion Date: Pending

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

Print Name: Blair Rollins Signed: Blair Rollins

Title: Regulatory Consultant Date: 8/7/14

OGCC Approved: Carlos Lujan, Ph.D. Digitally signed by Carlos Lujan, Ph.D. DN: cn=Carlos Lujan, Ph.D., o=COGCC, ou=EPS NW Region, email=carlos.lujan@state.co.us, c=US Date: 2014.08.21 08:28:37 -06'00' Title: _____ Date: _____

SOIL VAPOR EXTRACTION REMEDIATION WORK PLAN AND SYSTEM DESIGN

OXY USA WTP LP
CC 705-22-43
API 05-045-10345
Facility Number 335186
Garfield County, Colorado

Incident # 2232966
Remediation # 7820

Prepared For:

OXY USA WTP LP, OXY USA Inc.
760 Horizon Drive, Suite 101
Grand Junction, CO 81506

Prepared by:

Olsson Associates
760 Horizon Drive
Grand Junction, CO 81506

August 2014

Olsson Project Number 013-0242

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Appendices

1.0 INTRODUCTION

On January 11, 2013, it was discovered by OXY USA WTP LP (Oxy) that a valve failed due to freezing conditions on one of the two production tanks on the Oxy Cascade Creek (CC) 705-22-43 (site). The valve failure resulted in the release of approximately 180 barrels (bbls) of production water and condensate mixture into the unlined soil secondary containment area. The Colorado Oil and Gas Conservation Commission (COGCC) was verbally notified of the release on January 12, 2013. Approximately one bbl breached the containment area and flowed to the north along the site access road for approximately 50 feet. The remaining released fluid was adsorbed by the soil within the secondary containment. On January 11, 2013 the impacted soil outside the secondary containment was excavated and temporarily stockpiled within the secondary containment area for future disposal.

1.1 Site Location and Current Usage

The site is an active oil and gas production well site located in the southeast quarter of the northwest quarter of Section 5, Township 7 South, Range 97 West, Sixth Principle Meridian in Garfield County, Colorado (39.47766 north latitude and -108.24353 west longitude). Conn Creek, at its closest point, is approximately 0.23 miles west of the site. A commercial water well permitted to Oxy is located approximately 0.5 miles south-southwest (down gradient) of the site. The site location is depicted on the Site Location Map included as Figure 1.

1.2 Previous Site Investigations

On January 15, 2013 Olsson provided environmental oversight for a hydro-excavator to pothole three locations (PH1, PH2, and PH3) adjacent to the secondary containment to depths ranging from 6 feet to 12 feet below ground surface (ft-bgs) to assess the extent of the release, however petroleum-impacted soil was not observed.

On February 8, 2013 Olsson conducted a site investigation to assess potential subsurface soil impacts associated with the release by advancing five borings (BH1, BH2, BH3, BH4, and BH9) using a hollow stem auger drill rig at selected locations on the site. The locations of the potholes from February 2013 are depicted on the Boring Location Map included as Figure 2.

On July 16, 2013 to July 18, 2013 Olsson conducted an additional site investigation to further assess subsurface soil impacts by advancing seven additional borings (BH5, BH6, BH7, BH8, BH10, BH11, and BH12) as indicated on attached Figure 2. The CC 705-22-43 production was shut in and the production tanks and secondary containment were temporarily relocated to allow for additional site characterization. Upon reaching total depth at borings BH5, BH8, BH10, BH11 and BH12, dry wells were constructed to accommodate potential future remediation efforts.

Based on the site investigations, it appears petroleum-impacted soil is limited to the area south and west of the above ground storage tanks in the vicinity of the surface spill (Figure 2) at boring locations BH1, BH2, BH3, BH5, BH6 and BH7. The highest TPH concentration was

observed in a soil sample collected from boring BH8 at 15 feet below ground surface (fbgs) to 20 fbgs at 4,860 milligrams per kilogram (mg/kg) located south of the tank containment area. Groundwater was not observed in any of the site borings.

2.0 SVE PILOT TEST

Olsson conducted a soil vapor extraction (SVE) pilot test to evaluate the effectiveness of the technology and to collect data for full scale system design. The pilot test was conducted near the source area and utilized the existing wells (BH5, BH8, BH10, BH11, and BH12) installed during the July 2013 site investigations as depicted on the Boring Location Map (Figure 2). Boring logs and well completion diagrams were provided in prior reports by Olsson Associates.

On February 27, 2014, a SVE pilot test was conducted to evaluate the applicability of SVE technology at the site, estimate SVE vacuum/flow relationships, and monitor SVE radius of influence. During the SVE pilot test, a positive displacement blower applied a vacuum to the SVE well resulting in airflow through the screened formation.

2.1 Step-Rate Performance SVE Test

The step test is utilized to determine vacuum/flow relationship for the site specific subsurface conditions. During this test, the vacuum was incrementally increased and the flow rate was allowed to stabilize between each increase.

2.1.1 Test 1

In Test 1, the vacuum source was connected to well BH8 located south of the condensate tank and containment. Observation wells used for Test 1 included BH5, BH10, BH11, and BH12 (Figure 2) located approximate 33 feet, 48 feet, 64 feet, and 56 feet from vacuum source well BH8, respectively. A starting vacuum of 64-inch of water column (w.c.) was incrementally increased up to a vacuum of 124-inch w.c. The resulting flow from the test ranged from 15 standard cubic feet per minute (scfm) up to a maximum of 70 scfm. A chart of the vacuum/flow relationship for Test 1 is also provided in Appendix A. During Test 1, a maximum vacuum of 0.15-inch w.c. was observed at observation well BH10 approximately 48 feet from the vacuum well at an uncorrected vacuum flow rate of 70 scfm. An observed vacuum of 0.04 inches w.c. was measured during Test 1 at observation well BH5, located approximately 33 feet from the vacuum well. Typically, higher vacuum is anticipated the closer an observation well is to the vacuum source well. Olsson attributes this discrepancy to either geologic causes (lithology) or a “short circuit” in the subsurface resulting from a prior boring or site infrastructure.

2.1.2 Test 2

In Test 2, the vacuum source was connected to well BH10. Observation wells used for Test 2 included BH5, BH8, BH11, and BH12 (Figure 2) located approximate 55 feet, 48 feet, 64 feet, and 85 feet from vacuum source well BH10, respectively. A starting vacuum of 90-inch of w.c. was incrementally increased up to a vacuum of 110-inch w.c. The resulting flow from the test ranged from 40 scfm to a maximum of 73 scfm. A chart of the vacuum/flow relationship for Test 2 is provided in Appendix A. During Test 2, a maximum vacuum of 0.145-inch WC was

observed at observation well BH8 approximately 48 feet from the vacuum well at an uncorrected vacuum flow rate of 73 scfm. Vacuum fluctuations were observed during this test potentially resulting from site infrastructure or geology. However, the highest vacuum was measured at the closer observation well as anticipated.

2.5 Soil Vapor Sampling

Soil vapor sampling was conducted to assess the changes in soil vapor concentrations in the subsurface over the period of pilot test performance and to estimate the vapor-phase volatile organic compounds (VOC) mass removal from the pilot test area vicinity. Prior to the pilot test startup, baseline soil vapor samples were collected from the well in boring BH8 and BH5 to establish baseline conditions.

During the operation of the SVE pilot test, samples of extracted soil vapors were collected for field screening using a photo-ionization detector (PID) and laboratory analysis to monitor changes in VOC concentrations over the period of the pilot test performance, and to calculate the total mass of vapor-phase VOCs removed during the pilot.

3.0 AIR SAMPLE ANALYSIS

During the pilot test, SVE air emission samples were collected in 1-liter Summa canisters at the beginning and conclusion of the test. Additionally, PID measurements were taken at the blower exhaust stack and in the vacuum well. The air samples were analyzed for benzene, toluene, ethylbenzene, xylene (BTEX) using EPA Method TO-15. Total petroleum hydrocarbons (TPH) were analyzed using EPA Method TO-3. The table below summarizes the analytical results. The laboratory analytical reports are included as Appendix B.

Air Sample Analysis Summary

Sample Number		BH8 Initial	BH8 Final	BH5 Final	BH10 Final
Benzene	ppbv	8,870	0.749	736	ND
Ethylbenzene	ppbv	ND	0.597	219	ND
Toluene	ppbv	4,770	2.08	343	52.1
Xylenes (Total)	ppbv	3,520	4.68	390	124
TPH (C3 to C12)	ppbv	786,000	3.22	652,000	92,800

TPH – Total petroleum hydrocarbon ppbv – Parts per billion (volume)
ND – Not detected

3.1 SVE System Emissions

3.1.1 SVE System Calculation – Initial Startup Concentration Estimate

The SVE emission sample results were used to determine the amount of petroleum contamination being removed and assess potential air quality permit modifications. For air emission calculations the follow equation using the highest TPH concentration and average air flow volume of 50 scfm and a TPH concentration of 786,000 parts per billion volume (ppbv) and the molecular weight of weathered gasoline were used.

$$Qc = \frac{(Cc) * (F) * (MWc) * (60\ minutes/hour) * (24\ hours/day)}{(10^9) * (V)}$$

where:

Q_c = Mass Emission Rate of Contaminant c, Pounds (lbs)/day

C_c = Concentration of Contaminant c, ppbv

1×10^9 = Conversion from parts per billion to parts per unit volume

F = Vapor Volume Flow Rate, scfm

V = Molar Volume = 385.3 ft3/lb-mole (based on Ideal Gas Law for a gas at standard conditions of 68°F and 1 atmosphere)

MW_c = Molecular Weight of Contaminant c

= 100 grams/mole for TPHg (weathered gasoline/natural gas condensate)

Calculation for TPH-natural gas condensate emission

$$Qc = \frac{(786{,}000) * (50) * (100) * (60) * (24)}{(10^9) * (385.3)} = \frac{5.66 \times 10^{12}}{3.85 \times 10^{11}} = \textit{14.7 lbs./day TPH}$$

14.7 lbs./day x 365 day = *5,365.5 lbs./year or 2.68 tons/year*

Initial SVE emissions are typically much higher in concentration than long term system emissions. Olsson anticipates that the full scale system will not operate at pilot test emission rates for an extended period of time and are expected to be below two tons per year. Emission controls are not proposed at this time. Based on the air emissions analytical data, no individual hazardous air pollutant approaches air emission permitting thresholds.

3.1.2 Diesel Generator Emissions

A Waker Neuson G25 diesel generator will be used to power the SVE system. Olsson's emission calculations (included as Appendix C) indicate the generator emission will be below APEN reporting thresholds and therefore not required to be reported to the Colorado Department of Public Health and Environment (CDPHE).

4.0 SVE SYSTEM REMEDIATION SYSTEM

Pilot testing has shown that site conditions are conducive to remediation using SVE technology. The SVE system will be used for removal of soil-sorbed hydrocarbon impacts in the vadose zone. Based the site investigation findings, the area requiring remediation extend approximately 50 feet from the source area down gradient (Figure 2). Using the pilot test data, an SVE well radius of influence of 30 feet will provide adequate coverage to remediate the impacted area. The remediation system layout and target remediation area are depicted in Figure 3 and Figure 4, respectively.

4.1 Soil Vapor Extraction Wells

The SVE system incorporates two of the existing wells (BH5 and BH8) installed during the second site investigation. Three additional SVE wells (SB 612-1, SB612-2, and SB 612-3) were installed in June 2014 at the locations depicted on Figure 3. Boring and well completion logs for

the three additional SVE wells are included as Appendix D. The SVE wells are constructed with 2-inch diameter PVC. The wells are installed into bedrock shale with the screen interval extending to within 10 feet of the surface. The three existing wells not used for SVE (BH10, BH11, and BH12) will remain capped in place or potentially used as passive inlet wells.

4.2 Remediation Equipment

The SVE system and associated diesel-powered generator is located east of the AST secondary containment (Figure 3). The SVE system is contained in an enclosed trailer specifically modified to accommodate the SVE system with floor vents, explosion-proof lighting, ventilation fan, and heater. Equipment descriptions and specifications are included as Appendix E.

4.3 Trenching and Connecting Piping

Each SVE well is connected to an individual 2-inch Schedule 80 PVC pipe that leads to one of the five ports on the inlet header pipe at the SVE system trailer. All piping and well connections are installed below grade. Access to the SVE wells is provided by flush-mount manholes.

4.4 Remediation Progress Air Samples

Olsson will collect air samples from the SVE blower exhaust sampling port to evaluate remediation progress. Air samples will be collected in pre-evacuated one-liter Summa canisters for laboratory analysis. The air samples will be analyzed for BTEX using EPA Method TO-15 and TPH using EPA Method TO-3. Initially for the first month the system is operating, SVE exhaust samples will be collected on a weekly basis. During the second and third months of operation, SVE exhaust air samples will be collected on a bi-weekly basis. After the third month of operation, SVE exhaust air samples will be collected once per month. The air sample data will be graphically evaluated to determine instantaneous concentrations and estimate mass removal over time.

4.5 Confirmation Soil Borings

Olsson will advance two borings within the impacted soil area to collected soil samples for laboratory analysis. The locations of the two borings are depicted on Figure 5. The proposed confirmation soil borings are located near site investigation boring locations BH2 and BH8 that exhibited the highest TPH and BTEX soil concentrations observed during the site investigations (Please see Olsson's report previously submitted to the COGCC - *Additional Site Characterization Report*, September 2013).

Soil cores will be collected continuously (lithology permitting) using a 4-inch diameter continuous sampler. An Olsson geologist will document the site lithology, examine the soils for suspected environmental impact (i.e. chemical staining and/or odors) and field screen the soils using a photo-ionization detector (PID) for the presence of volatile organic vapors as the borings are advanced. The field soil screening method involves placing a representative sample from each soil core interval into plastic bags, sealing the bags, and allowing the bag contents to equilibrate to the surrounding ambient conditions. The intake probe of a PID is inserted into the

individual sample bags to measure the volatile organic vapors desorbed from the impacted soils into the headspace of the bag. The PID readings are recorded in parts per million (ppm). To obtain a vertical profile of the residual hydrocarbon concentrations, one soil sample will be collected for laboratory analysis from each 5-foot boring interval.

4.6 Confirmation Soil Sample Laboratory Analysis

Soil samples analysis will be analyzed for the following COGCC Table 910-1 constituents:

- Gasoline range hydrocarbons (GRO) using EPA Method 8015
- Diesel range hydrocarbons (DRO) using EPA Method 8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8260B

5.0 SITE SAFETY

Safety concerns associated with this project are:

- Slip and trip hazards
- Hydrogen sulfide (H_2S) gas – The site is a Oxy identified H_2S location
- Muscle strain
- Driving to and from the site
- Site oil and gas production equipment
- Site vehicular traffic
- Adverse weather conditions (snow and cold)
- Use motorized equipment at an operating oil and gas production facility
- Exposure to petroleum compounds
- Operation of the SVE pilot test blower system
- Insect bites and animal encounters
- Loud noise from the SVE equipment

A copy of Olsson's Site Specific Health and Safety Plan (HASP) with Job Safety Analysis Worksheets (JSAs) will be maintained in the project file and updated seasonally. A copy of the will be kept onsite in the equipment trailer.

6.0 SITE CLOSURE REPORT

Olsson will prepare a summary report upon conclusion of the project that will include confirmation soil samples collected from two boring locations in the remediated area to illustrate cleanup goals have been achieved and request concurrence from the COGCC to grant regulatory closure.

FIGURES

Conn Creek
Existing Road
705-22-43 well pad

0 0.25 0.5 0.75 Miles

N
W E
S

PROJECT NO:	013-0242
DRAWN BY:	BKR
DATE:	04/02/2013

Site Map
CC 705-22-43 Pad
OXY USA WTP LP
Garfield County, Colorado

OLSSON ASSOCIATES
760 HORIZON DRIVE, SUITE 102
GRAND JUNCTION, CO 81506
TEL 970.263.7800
FAX 970.263.7456

FIGURE
1

Boring locations: February 2013 and July 2013

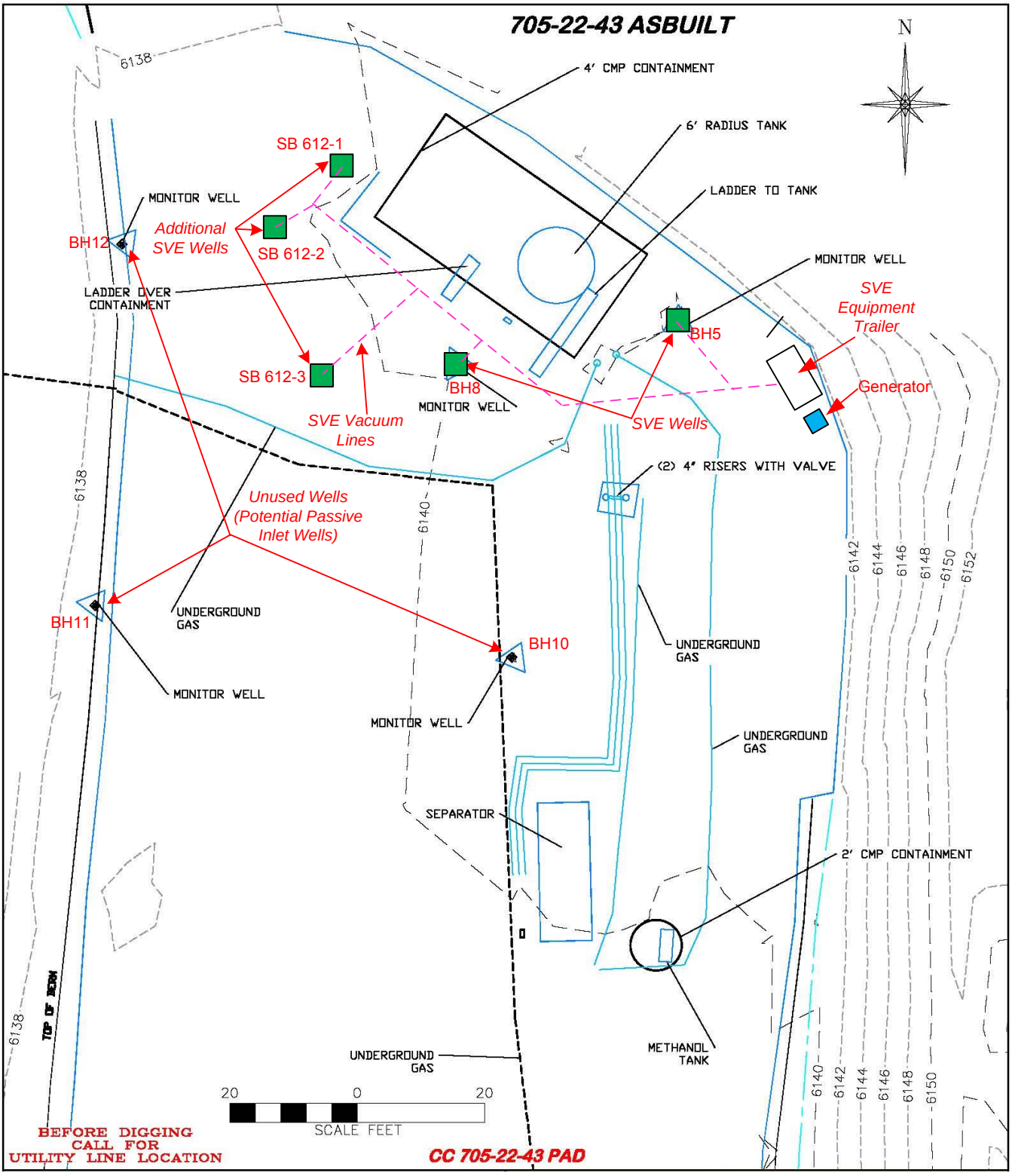
Boring completed with slotted PVC for future potential remediation option

Locations Hydro-Excavated on 1/15/13

Boring Impacted with Petroleum Hydrocarbon Above 500 Milligrams per Kilogram (mg/kg)

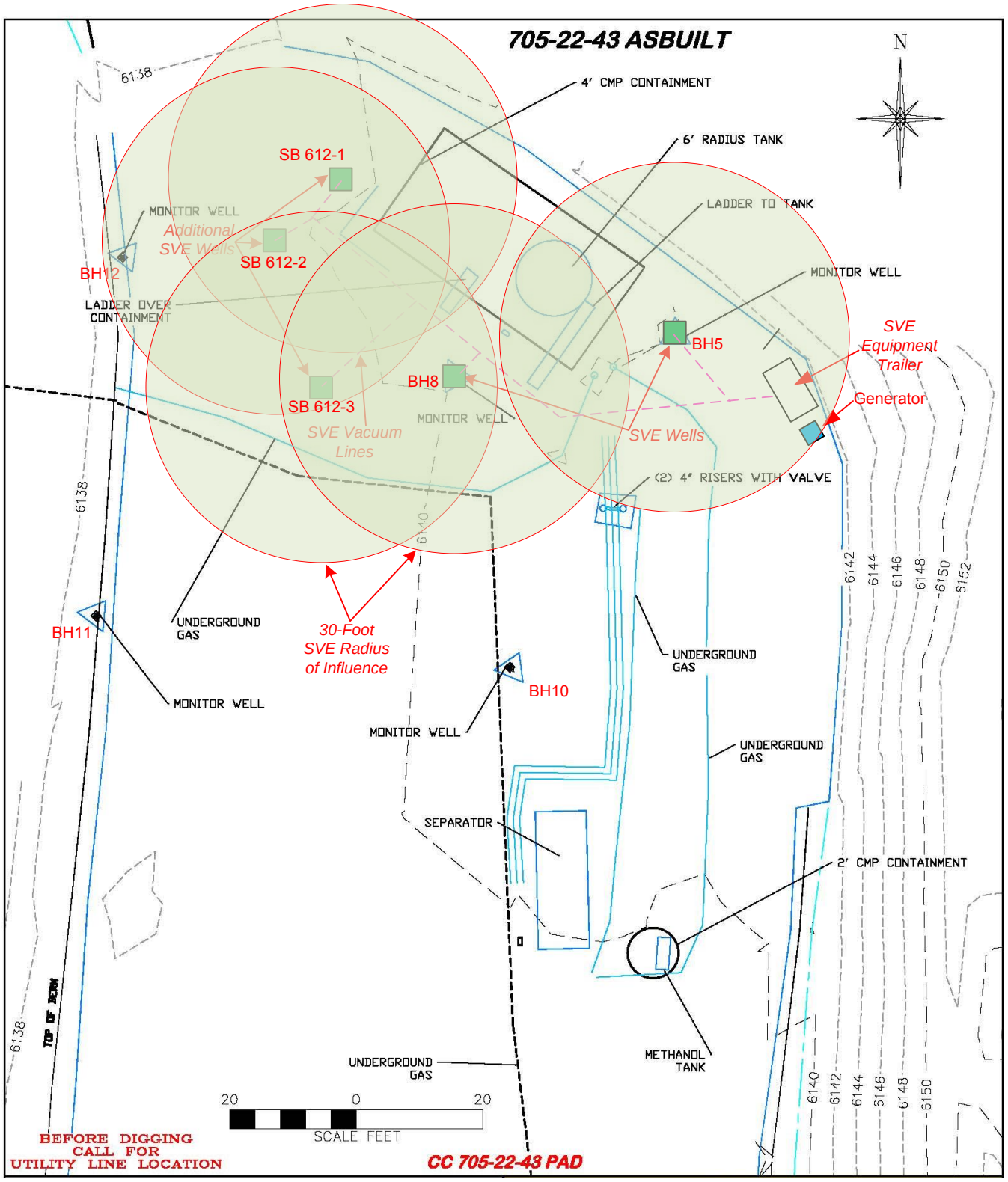
Estimated Area of Soil Petroleum Hydrocarbon Impact Above 500 mg/kg

PROJECT NO: 013-0242	Boring Location Map CC 705-22-43 Pad OXY USA WTP LP	OLSSON ASSOCIATES	760 Horizon Drive Grand Junction, CO 81506 TEL 970.263.7800 FAX 970.263.7456	FIGURE
DRAWN BY: BKR				2
DATE: 8/20/2013				



Survey and Drawing by DR Griffin & Associates, Inc. - Rock Springs, Wyoming

PROJECT NO: 013-0242 DRAWN BY: KJT DATE: 7/30/2014	SVE SYSTEM LAYOUT OXY USA WTP LP CC 705-22-43	OLSSON ASSOCIATES	760 Horizon Drive Grand Junction, Colorado TEL 970-263-7800 FAX 303-263-7456	Figure 3



Survey and Drawing by DR Griffin & Associates, Inc. - Rock Springs, Wyoming

PROJECT NO: 013-0242 DRAWN BY: KJT DATE: 7/30/2014	SVE SYSTEM TARGET REMEDIATION AREA OXY USA WTP LP CC 705-22-43	OLSSON ASSOCIATES	760 Horizon Drive Grand Junction, Colorado TEL 970-263-7800 FAX 303-263-7456	Figure 4

Boring locations: February 2013 and July 2013

Boring completed with slotted PVC for future potential remediation option

Locations Hydro-Excavated on 1/15/13

Proposed Confirmation Boring

Boring Impacted with Petroleum Hydrocarbon Above 500 Milligrams per Kilogram (mg/kg)

Estimated Area of Soil Petroleum Hydrocarbon Impact Above 500 mg/kg

PROJECT NO: 013-0242	Proposed Confirmation Boring Locations	OLSSON ASSOCIATES	760 Horizon Drive Grand Junction, CO 81506 TEL 970.263.7800 FAX 970.263.7456	FIGURE
DRAWN BY: KJT	CC 705-22-43 Pad			5
DATE: 7/30/2014	OXY USA WTP LP			

APPENDIX A

PILOT TEST DATA

SVE PILOT TEST DATA SHEET

Test No.: 1 **Project Name/Location:** Oxy 705-22-43 - Debeque, CO

Test Type: SVE **Project Number** 013-0242

Test date: 3/27/2014 **Teste Personnel:** Terry Sprouce (Process Technology), Kevin Taylor (Olsson)

Time	EXTRACTION WELL/ BLOWER DATA						MONITOR POINT DATA				COMMENTS
	Vacuum Well BH8						BH5	BH10	BH12	BH11	
	FLOW		PID		VAC.		R (ft) = 33	R (ft) = 48	R (ft) = 56	R (ft) = 64	
	Influent (scfm)	Discharge (scfm)	Influent (ppm)	Discharge (ppm)	Blower inlet (in. Hg)	Wellhead (in w.c.)	Well head Vac (" w.c)	Well head Vac (" w.c)	Well head Vac (" w.c)	Well head Vac (" w.c)	
baseline											
1043	15	NR	NR	3.4	64	55	0.00	0.05	0.00	0	
1100	18	NR	NR	NR	64	56	0.00	0.055	0.00	0.001	
1115	18	NR	NR	NR	64	56	0.00	0.055	0.00	0.001	
1117	40	NR	NR	NR	108	93	0.02	0.1	0.00	0.001	
1148	46	NR	NR	NR	100	85	0.04	0.11	0.00	0.015	
1209	48	NR	NR	560	98	85	0.03	0.11	0.00	0.02	
1220	70	NR	NR	NR	128	110	0.04	0.14	0.00	0.02	
1248	70	NR	NR	940	124	105	0.04	0.15	0.00	0.03	
	END OF TEST										
	PID (begin)=	436					PID (begin)=136	PID (begin)= NR	PID (begin)= NR	PID (begin)= NR	
	DTW (begin)	NR					DTW (begin)=NR	DTW (begin)= NR	DTW (begin)= NR	DTW (begin)= NR	
	PID (end)=	621					PID (end)= NR	PID (end)= NR	PID (end)= NR	PID (end)= NR	
	DTW(end)=	NR					DTW(end)= NR	DTW(end)= NR	DTW(end)= NR	DTW(end)= NR	

SVE PILOT TEST DATA SHEET

Test No.: 2 **Project Name/Location:** Oxy 705-22-43 - Debeque, CO

Test Type: SVE **Project Number** 013-0242

Test date: 3/27/2014 **Teste Personnel:** Terry Sprouce (Process Technology), Kevin Taylor (Olsson)

Time	EXTRACTION WELL/ BLOWER DATA						MONITOR POINT DATA				COMMENTS
	Vacuum well BH-10						BH8	BH5	BH11	BH12	
	FLOW		PID		VAC.		R (ft) = 48	R (ft) = 55	R (ft) = 64	R (ft) = 85	
	Influent (scfm)	Discharge (scfm)	Influent (ppm)	Discharge (ppm)	Blower inlet (in. Hg)	Wellhead (in w.c.)	Well head Vac (" w.c)	Well head Vac (" w.c)	Well head Vac (" w.c)	Well head Vac (" w.c)	
baseline											
1330	40	NR	NR	6.5	90	55	0.090	0.01	0.05	0	
1352	48	NR	NR	37	84	56	0.100	0.04	0.06	0.05	
1414	49	NR	NR	44	80	56	0.125	0.12	0.07	0.10	
1431	49	NR	NR	57	82	93	0.105	0.02	0.065	0.04	
1438	70	NR	NR	75	110	85	0.135	0.04	0.08	0.03	
1509	73	NR	NR	72	108	85	0.145	0.04	0.09	0.03	
1530	73	NR	NR	NR	NR	NR	UNCHANGED				
	END OF TEST										
	PID (begin)=					NR	PID (begin)=136	PID (begin)= NR	PID (begin)= NR	PID (begin)= NR	
	DTW (begin)=					NR	DTW (begin)=NR	DTW (begin)= NR	DTW (begin)= NR	DTW (begin)= NR	
	PID (end)=					19.7	PID (end)= NR	PID (end)= NR	PID (end)= NR	PID (end)= NR	
	DTW(end)=					NR	DTW(end)= NR	DTW(end)= NR	DTW(end)= NR	DTW(end)= NR	

Test 1 - SVE Venturi Conversions

Venturi Data

Model	505
connections	1.5" fnpt
fullscale dp(" w.c.)	100
fullscale flow(gpm)	41

Assumed Standard Conditions

P std (psia)	14.73
T std (deg F)	70

Assumed Atmosperic Pressure

P atm	
@ 6000 ft (psia)	11.77

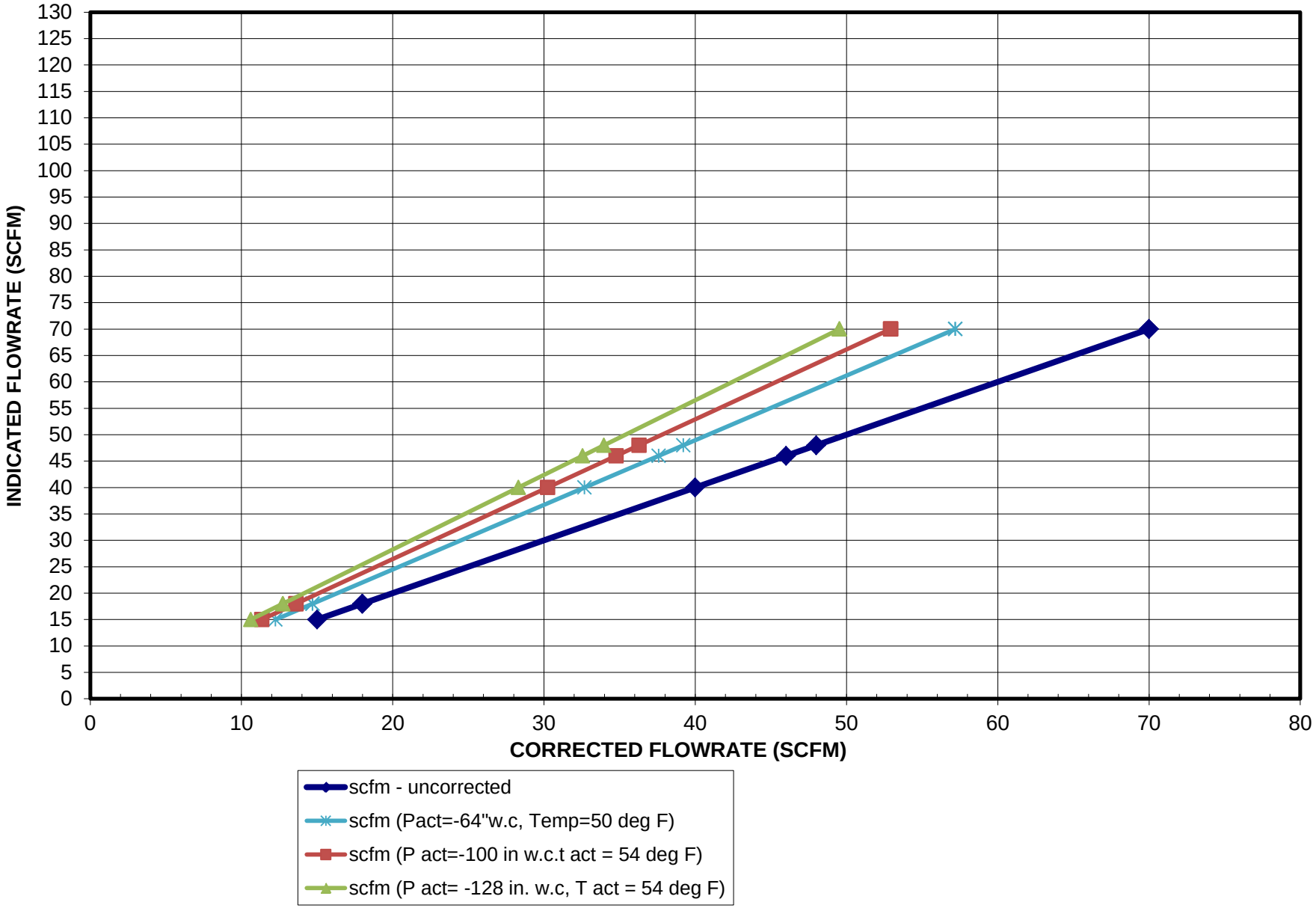
Equiv. Flow (gpm)	Diff. Press. ("w.c.)	Operating Parameters & Conversion Factors	SCFM (uncorr.)	SCFM (corrected for actual P & T)				
		P act(" w.c.g)	0	-64	-98	-100	-108	-128
		Pact (psia)	14.73	9.46	8.24	8.16	7.88	7.15
		T act (deg F)	70	50	50	54	54	54
		Fpa	1.0	1.248	1.337	1.343	1.368	1.435
		Fta	1.0	0.981	0.981	0.985	0.985	0.985
3.9	0.9		15	12.3	11.4	11.3	11.1	10.6
4.7	1.3		18	14.7	13.7	13.6	13.4	12.7
4.7	1.3		18	14.7	13.7	13.6	13.4	12.7
10.5	6.6		40	32.7	30.5	30.2	29.7	28.3
12.1	8.7		46	37.6	35.1	34.8	34.2	32.6
12.6	9.5		48	39.2	36.6	36.3	35.6	34.0
18.4	20.2		70	57.2	53.4	52.9	52.0	49.5
18.4	20.2		70	57.2	53.4	52.9	52.0	49.5

Notes:
1. scfm value based on 14.73 pisa and 70 deg F. SCFM must be corrected for actual conditions as follows:

SCFM (corrected) = SCFM(uncorrected) X equiv flow(gpm) X [Cg / (Fta X Fpa)]

TEST 1 - PROCESS TECHNOLOGY SUPPORT. ,LLC
PILOT SKID - SVE FLOW VENTURI CURVES

(Indicated Flowrate vs. Corrected Flowrate)



Test 2 - SVE Venturi Conversions

Venturi Data

Model	505
connections	1.5" fnpt
fullscale dp(" w.c.)	100
fullscale flow(gpm)	41

Assumed Standard Conditions

P std (psia)	14.73
T std (deg F)	70

Assumed Atmosperic Pressure

P atm	
@ 6000 ft (psia)	11.77

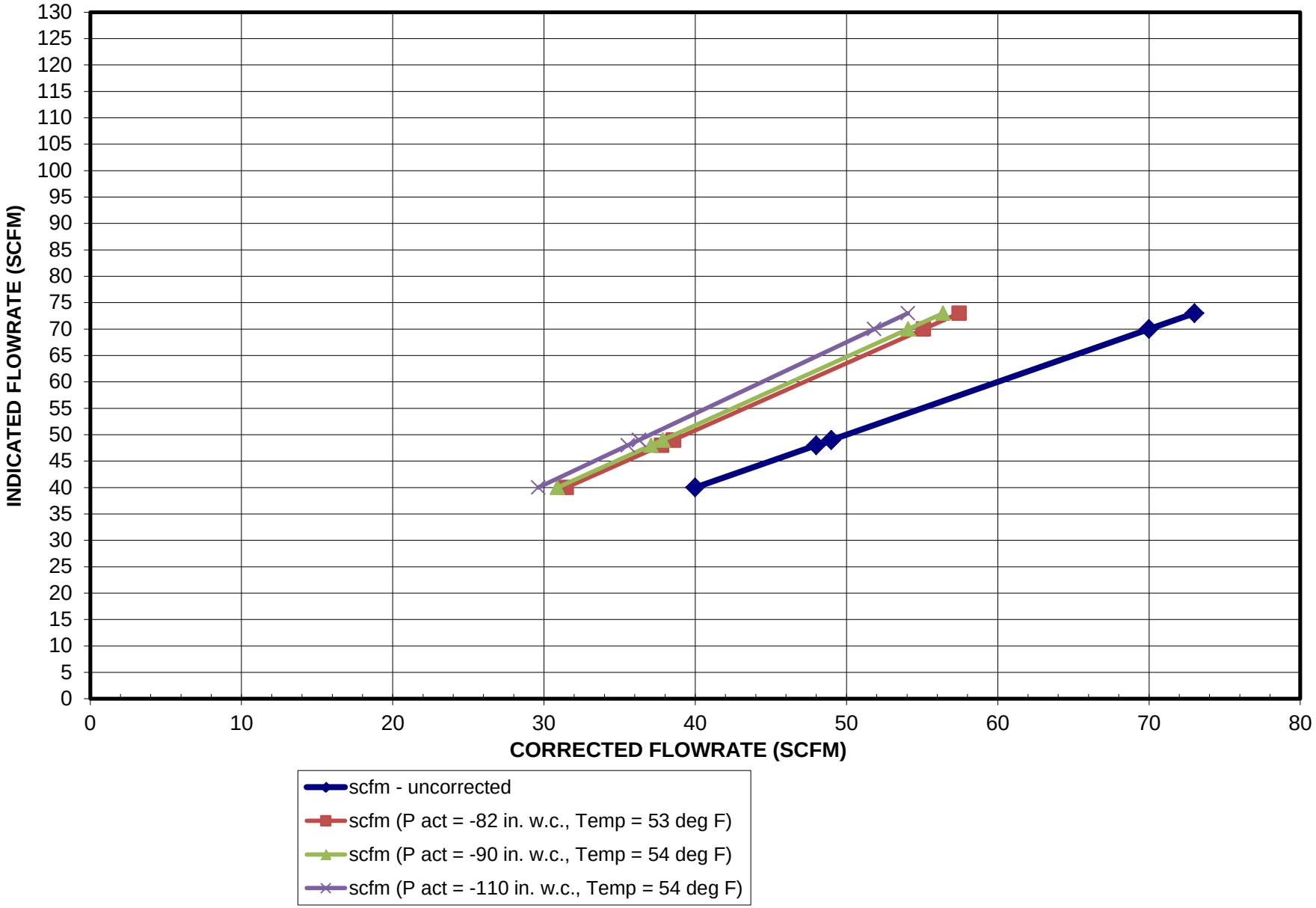
Equiv. Flow (gpm)	Diff. Press. ("w.c.)	Operating Parameters & Conversion Factors	SCFM (uncorr.)	SCFM (corrected for actual P & T)				
		P act(" w.c.g)	0	-90	-84	-82	-108	-110
		Pact (psia)	14.73	8.52	8.74	8.81	7.88	7.80
		T act (deg F)	70	54	54	52	50	52
		Fpa	1.0	1.315	1.298	1.293	1.368	1.374
		Fta	1.0	0.985	0.985	0.983	0.981	0.983
10.5	6.6		40	30.9	31.3	31.5	29.8	29.6
12.6	9.5		48	37.1	37.5	37.8	35.8	35.5
12.9	9.9		49	37.9	38.3	38.6	36.5	36.3
12.9	9.9		49	37.9	38.3	38.6	36.5	36.3
18.4	20.2		70	54.1	54.8	55.1	52.2	51.8
19.2	22.0		73	56.4	57.1	57.4	54.4	54.1

Notes:
1. scfm value based on 14.73 pisa and 70 deg F. SCFM must be corrected for actual conditions as follows:

SCFM (corrected) = SCFM(uncorrected) X equiv flow(gpm) X [Cg / (Fta X Fpa)]

TEST 2 - PROCESS TECHNOLOGY SUPPORT. ,LLC
PILOT SKID - SVE FLOW VENTURI CURVES

(Indicated Flowrate vs. Corrected Flowrate)



APPENDIX B

LABORATORY ANALYTICAL REPORTS

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:		**Project Name:**	**Oxy 705-43-22/Proj. 013-0242**
Olsson Associates		**Site:**	**Golden, CO.**
Kevin Taylor		**Site Address:**	
4690 Table Mountain Drive #200			
		PO Number:	**013-0242**
Golden		**State:**	**Colorado**
Colorado		**State Cert. No.:**	
80403-		**Date Reported:**	**3/19/2014**
ph: (303) 237-2072	**fax:**		

This Report Contains A Total Of 15 Pages

Excluding This Page

And

Chain Of Custody

3/19/2014

Neaundra Wyatt Version 2.3 - Modified June 13, 2012 Date

Client Services

Accutest certifies that this data package complies with applicable data and QA standards with any exceptions that may have been noted in accompanying documentation. Test results meet all requirements of NELAC, unless specified in the narrative. Accutest authorizes the release of the data contained in this hardcopy or equivalent electronic deliverable media.

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Case Narrative for:

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:		Project Name:	Oxy 705-43-22/Proj. 013-0242
Olsson Associates		Site:	Golden, CO.
Kevin Taylor		Site Address:	
4690 Table Mountain Drive #200			
Golden		PO Number:	013-0242
Colorado		State:	Colorado
80403-		State Cert. No.:	
ph: (303) 237-2072	fax:	Date Reported:	3/19/2014

I. SAMPLE RECEIPT:

All samples were received intact.

II: ANALYSIS AND EXCEPTIONS:

No exceptions noted.

III. GENERAL REPORTING COMMENTS:

The canisters used to collect samples for TO-15 analysis are individually certified as clean to a level of 0.2 ppbv, with the exception of Acetone, Ethanol and Isopropanol which are certified to 1.0 ppbv. Methylene Chloride is certified to 0.4 ppbv.

The analytical results reported in this report met method requirements unless noted in this narrative or by use of qualifiers on the analytical result pages.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

Accutest Labs of Gulf Coast, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Neaundra Wyatt
Client Services

14030014 Page 1
3/19/2014
Date

Test results meet all requirements of NELAC, unless specified in the narrative.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To: Olsson Associates
Kevin Taylor
4690 Table Mountain Drive #200

Golden
Colorado
80403-
ph: (303) 237-2072 fax:

Fax To:

Project Name: Oxy 705-43-22/Proj. 013-0242
Site: Golden, CO.
Site Address:

PO Number: 013-0242
State: Colorado
State Cert. No.:
Date Reported: 3/19/2014

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
B8-Initial	14030014-01	Air	02/27/2014 9:55	3/5/2014 9:40:00 AM		☐
B8-Final	14030014-02	Air	02/27/2014 13:00	3/5/2014 9:40:00 AM		☐
B5-Initial	14030014-03	Air	02/27/2014 9:55	3/5/2014 9:40:00 AM		☐
B10-Final	14030014-04	Air	02/27/2014 15:20	3/5/2014 9:40:00 AM		☐

Neaundra Wyatt
Client Services

3/19/2014
Date

Richard Rodriguez
Laboratory Director

Jane Freemyer
Quality Assurance Officer

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Client Sample ID: B8-Initial **Collected:** 02/27/2014 9:55 **Lab Sample ID:** 14030014-01

Site: Golden, CO.

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
EPA TO-15 AIR ANALYSIS				**MCL**	**TO-15**	**Units: ppbv**	
Benzene	8870		800	1600	03/16/14 3:25	E_G	5849143
Ethylbenzene	ND		800	1600	03/16/14 3:25	E_G	5849143
m,p-Xylene	3520		800	1600	03/16/14 3:25	E_G	5849143
o-Xylene	ND		800	1600	03/16/14 3:25	E_G	5849143
Toluene	4770		800	1600	03/16/14 3:25	E_G	5849143
Xylenes,Total	3520		800	1600	03/16/14 3:25	E_G	5849143
EPA TO-3 AIR ANALYSIS				**MCL**	**TO-3**	**Units: ppbv**	
TPH (C3-C12)	786000		40000	1600	03/16/14 3:25	E_G	5849168
TPH (C5-C12)	786000		40000	1600	03/16/14 3:25	E_G	5849168
TPH (C6-C10)	679000		40000	1600	03/16/14 3:25	E_G	5849168

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Client Sample ID: B8-Final **Collected:** 02/27/2014 13:00 **Lab Sample ID:** 14030014-02

Site: Golden, CO.

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
EPA TO-15 AIR ANALYSIS			**MCL**	**TO-15**	**Units: ppbv**		
Benzene	0.749		0.5	1	03/17/14 2:52	CLJ	5849211
Ethylbenzene	0.597		0.5	1	03/17/14 2:52	CLJ	5849211
m,p-Xylene	2.08		0.5	1	03/17/14 2:52	CLJ	5849211
o-Xylene	1.14		0.5	1	03/17/14 2:52	CLJ	5849211
Toluene	4.68		0.5	1	03/17/14 2:52	CLJ	5849211
Xylenes,Total	3.22		0.5	1	03/17/14 2:52	CLJ	5849211
EPA TO-3 AIR ANALYSIS			**MCL**	**TO-3**	**Units: ppbv**		
TPH (C3-C12)	699		25	1	03/17/14 2:52	CLJ	5849215
TPH (C5-C12)	389		25	1	03/17/14 2:52	CLJ	5849215
TPH (C6-C10)	149		25	1	03/17/14 2:52	CLJ	5849215

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Client Sample ID: B5-Initial **Collected:** 02/27/2014 9:55 **Lab Sample ID:** 14030014-03

Site: Golden, CO.

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
EPA TO-15 AIR ANALYSIS				**MCL**	**TO-15**	**Units: ppbv**	
Benzene	736		160	320	03/16/14 5:57	E_G	5849144
Ethylbenzene	219		160	320	03/16/14 5:57	E_G	5849144
m,p-Xylene	390		160	320	03/16/14 5:57	E_G	5849144
o-Xylene	ND		160	320	03/16/14 5:57	E_G	5849144
Toluene	343		160	320	03/16/14 5:57	E_G	5849144
Xylenes,Total	390		160	320	03/16/14 5:57	E_G	5849144
EPA TO-3 AIR ANALYSIS				**MCL**	**TO-3**	**Units: ppbv**	
TPH (C3-C12)	652000		40000	1600	03/16/14 21:56	CLJ	5849213
TPH (C5-C12)	616000		40000	1600	03/16/14 21:56	CLJ	5849213
TPH (C6-C10)	502000		40000	1600	03/16/14 21:56	CLJ	5849213

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Client Sample ID: B10-Final **Collected:** 02/27/2014 15:20 **Lab Sample ID:** 14030014-04

Site: Golden, CO.

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
EPA TO-15 AIR ANALYSIS				**MCL**	**TO-15**	**Units: ppbv**	
Benzene	ND		40	80	03/16/14 7:54	E_G	5849145
Ethylbenzene	ND		40	80	03/16/14 7:54	E_G	5849145
m,p-Xylene	124		40	80	03/16/14 7:54	E_G	5849145
o-Xylene	ND		40	80	03/16/14 7:54	E_G	5849145
Toluene	52.1		40	80	03/16/14 7:54	E_G	5849145
Xylenes,Total	124		40	80	03/16/14 7:54	E_G	5849145
EPA TO-3 AIR ANALYSIS				**MCL**	**TO-3**	**Units: ppbv**	
TPH (C3-C12)	92800		8000	320	03/17/14 2:04	CLJ	5849214
TPH (C5-C12)	93300		8000	320	03/17/14 2:04	CLJ	5849214
TPH (C6-C10)	76800		8000	320	03/17/14 2:04	CLJ	5849214

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

Quality Control Documentation

ACCUTEST LABORATORIES

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-15 Air Analysis
Method: TO-15
WorkOrder: 14030014
Lab Batch ID: R323448

Method Blank

RunID: GCMS1A_140315A-5849139 Units: ppbv
Analysis Date: 03/15/2014 20:28 Analyst: E_G

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
14030014-01A	B8-Initial
14030014-03A	B5-Initial
14030014-04A	B10-Final

Analyte	Result	Rep Limit
Benzene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylene	ND	0.50
o-Xylene	ND	0.50
Toluene	ND	0.50
Xylenes,Total	ND	0.50

Laboratory Control Sample (LCS)

RunID: GCMS1A_140315A-584913 Units: ppbv
Analysis Date: 03/15/2014 17:46 Analyst: E_G

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	10.00	7.781	77.81	53	148
Ethylbenzene	10.00	8.815	88.15	61	157
m,p-Xylene	20.00	18.49	92.47	45	168
o-Xylene	10.00	9.169	91.69	58	157
Toluene	10.00	8.384	83.84	66	146
Xylenes,Total	30.000	27.659	92.209	53	161

Sample Duplicate

Original Sample: 14030066-04
RunID: GCMS1A_140315A-584914 Units: ppbv
Analysis Date: 03/15/2014 21:41 Analyst: E_G

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Benzene	ND	ND	0	25

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-15 Air Analysis
Method: TO-15
WorkOrder: 14030014
Lab Batch ID: R323448

Sample Duplicate

Original Sample: 14030066-04
RunID: GCMS1A_140315A-584914 Units: ppbv
Analysis Date: 03/15/2014 21:41 Analyst: E_G

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Ethylbenzene	ND	ND	0	25
m,p-Xylene	ND	ND	0	25
o-Xylene	ND	ND	0	25
Toluene	5.19	5.275	1.54	25
Xylenes,Total	ND	ND	0	25

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-3 Air Analysis **WorkOrder:** 14030014
Method: TO-3 **Lab Batch ID:** R323454

Method Blank

RunID: GCMS1A_140315C-5849161 Units: ppbv
Analysis Date: 03/15/2014 20:28 Analyst: E_G

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
14030014-01A	B8-Initial

Analyte	Result	Rep Limit
TPH (C3-C12)	ND	25
TPH (C5-C12)	ND	25
TPH (C6-C10)	ND	25

Laboratory Control Sample (LCS)

RunID: GCMS1A_140315C-584916 Units: ppbv
Analysis Date: 03/15/2014 19:48 Analyst: E_G

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
TPH (C3-C12)	250.0	275.6	110.2	70	130
TPH (C5-C12)	223.6	250.2	111.9	70	130
TPH (C6-C10)	149.2	165.6	111.0	70	130

Sample Duplicate

Original Sample: 14030066-04
RunID: GCMS1A_140315C-584916 Units: ppbv
Analysis Date: 03/15/2014 21:41 Analyst: E_G

Analyte	Sample Result	DUP Result	RPD	RPD Limit
TPH (C3-C12)	1070	1210	12.1	30
TPH (C5-C12)	1010	1184	15.6	30
TPH (C6-C10)	293	338.6	14.6	30

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-3 Air Analysis **WorkOrder:** 14030014
Method: TO-3 **Lab Batch ID:** R323457

Method Blank

RunID: GCMS1A_140316B-5849182 Units: ppbv
Analysis Date: 03/16/2014 20:08 Analyst: CLJ

Analyte	Result	Rep Limit
TPH (C3-C12)	ND	25
TPH (C5-C12)	ND	25
TPH (C6-C10)	ND	25

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
14030014-02A	B8-Final
14030014-03A	B5-Initial
14030014-04A	B10-Final

Laboratory Control Sample (LCS)

RunID: GCMS1A_140316B-584918 Units: ppbv
Analysis Date: 03/16/2014 19:28 Analyst: CLJ

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
TPH (C3-C12)	250.0	302.3	120.9	70	130
TPH (C5-C12)	223.6	271.5	121.4	70	130
TPH (C6-C10)	149.2	180.9	121.3	70	130

Sample Duplicate

Original Sample: 14030014-03
RunID: GCMS1A_140316B-584918 Units: ppbv
Analysis Date: 03/16/2014 21:56 Analyst: CLJ

Analyte	Sample Result	DUP Result	RPD	RPD Limit
TPH (C3-C12)	652000	779100	17.7	30
TPH (C5-C12)	616000	737700	18.1	30
TPH (C6-C10)	502000	603000	18.3	30

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-15 Air Analysis **WorkOrder:** 14030014
Method: TO-15 **Lab Batch ID:** R323462

Method Blank

RunID: GCMS1A_140316D-5849208 Units: ppbv
Analysis Date: 03/16/2014 20:08 Analyst: CLJ

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
14030014-02A	B8-Final

Analyte	Result	Rep Limit
Benzene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylene	ND	0.50
o-Xylene	ND	0.50
Toluene	ND	0.50
Xylenes,Total	ND	0.50

Laboratory Control Sample (LCS)

RunID: GCMS1A_140316D-584920 Units: ppbv
Analysis Date: 03/16/2014 17:26 Analyst: CLJ

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	10.00	7.654	76.54	53	148
Ethylbenzene	10.00	8.829	88.29	61	157
m,p-Xylene	20.00	19.08	95.40	45	168
o-Xylene	10.00	9.327	93.27	58	157
Toluene	10.00	8.346	83.46	66	146
Xylenes,Total	30.000	28.407	94.686	53	161

Sample Duplicate

Original Sample: 14030014-03
RunID: GCMS1A_140316D-584920 Units: ppbv
Analysis Date: 03/16/2014 21:56 Analyst: CLJ

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Benzene	ND	ND	0	25

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Quality Control Report

Olsson Associates

Oxy 705-43-22/Proj. 013-0242

Analysis: EPA TO-15 Air Analysis
Method: TO-15
WorkOrder: 14030014
Lab Batch ID: R323462

Sample Duplicate

Original Sample: 14030014-03
RunID: GCMS1A_140316D-584920 Units: ppbv
Analysis Date: 03/16/2014 21:56 Analyst: CLJ

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Ethylbenzene	ND	ND	0	25
m,p-Xylene	ND	ND	0	25
o-Xylene	ND	ND	0	25
Toluene	ND	ND	0	25
Xylenes,Total	ND	ND	0	25

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Version 2.1 - Modified February 11, 2011

Sample Receipt Checklist

And

Chain of Custody

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Sample Receipt Checklist

Workorder:	**14030014**	Received By:	**RM**
Date and Time Received:	**3/5/2014 9:40:00 AM**	Carrier name:	**FedEx**
Temperature:	**25.2°C**	Chilled by:	**Not Chilled**

1.	**Shipping container/cooler in good condition?**	Yes	☑	No	☐	Not Present ☐
2.	**Custody seals intact on shippping container/cooler?**	Yes	☐	No	☐	Not Present ☑
3.	**Custody seals intact on sample bottles?**	Yes	☐	No	☐	Not Present ☑
4.	**Chain of custody present?**	Yes	☑	No	☐	
5.	**Chain of custody signed when relinquished and received?**	Yes	☑	No	☐	
6.	**Chain of custody agrees with sample labels?**	Yes	☑	No	☐	
7.	**Samples in proper container/bottle?**	Yes	☑	No	☐	
8.	**Sample containers intact?**	Yes	☑	No	☐	
9.	**Sufficient sample volume for indicated test?**	Yes	☑	No	☐	
10.	**All samples received within holding time?**	Yes	☑	No	☐	
11.	**Container/Temp Blank temperature in compliance?**	Yes	☑	No	☐	
12.	**Water - VOA vials have zero headspace?**	Yes	☐	No	☐	VOA Vials Not Present ☑
13.	**Water - Preservation checked upon receipt (except VOA*)?**	Yes	☐	No	☐	Not Applicable ☑

***VOA Preservation Checked After Sample Analysis**

Accutest Representative: _____ **Contact Date & Time:** _____

Client Name Contacted: _____

Non Conformance Issues: _____

Client Instructions: _____

1C44501 1405004

CHAIN OF CUSTODY

ACCUTEST LABORATORIES

Air Sampling Field Data Sheet

FED-EX Tracking #	Bottle Order Control #
Lab Quote #	Lab Job # M-G28630-TF

PAGE 1 OF 1

Client / Reporting Information

Company Name: Olsson Associates	Project Name: OXY 705-43-22
Address: 4690 Table Mountain Dr. 200	Street: Garfield County
City: Golden State: CO Zip: 80403	City: C/O State:
Project Contact: Kevin Taylor E-mail:	Project #: 013-0242
Phone #: 303-237-2072 Fax #:	Client Purchase Order #:
Sampler(s) Name(s):	

Weather Parameters

Temperature (Fahrenheit)
Start: Maximum:
Stop: Minimum:

Atmoshpheric Pressure (inches of Hg)
Start: Maximum:
Stop: Minimum:

Other weather comment:

Requested Analysis

Standard TO-15 Reporting List
MA DEP APH
BTEX/TPH TO-3

Lab Sample #	Field ID / Point of Collection	Air Type: Indoor(I) Soil Vap(SV) Ambient(A)	Sampling Equipment Info: Canister Serial #	Canister Size 6L or 1L	Flow Controller Serial #	Start Sampling Information: Date	Time (24hr clock)	Canister Pressure ("Hg)	Interior Temp (F)	Sampler Init.	Stop Sampling Information: Date	Time (24hr clock)	Canister Pressure ("Hg)	Interior Temp (F)	Sampler Init.
-1	B8-Initial		1083	1L		2/27/14	0955			KT	2/28	—	—	—	—
-2	B8-Final		1389	1L		2/27/14	1300			KT	2/28				
-3	B5-Initial		J1750	1L		2/27/14	0955			KT	2/28				
-4	B10-Final		J1755	1L		2/27/14	1520			KT	2/28				

Turnaround Time (Business days)

Standard - 15 Days	X
10 Day	
5 Day	
3 Day	
2 Day	
1 Day	
Other	

Approved By: _____

Date: _____

Data Deliverable Information

Comm A	
Comm B	
Full T1	
Other:	

Comments / Remarks

2 unused cans returned (1 Liter)
-5 M192
-6 M196
AF 3/1/14

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	2/28/14 1605	1	2 2.28.14		2 FX
3 FX	3/1/14 11:00	3	4	3/4/14	4 FX
5	3/5/14 940	5	Custody Seal #		

7 of 21

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:		Project Name:	Oxy 705-43-22/Proj. 013-0242
Olsson Associates		Site:	Golden, CO.
Kevin Taylor		Site Address:	
4690 Table Mountain Drive #200			
Golden		PO Number:	013-0242
Colorado		State:	Colorado
80403-		State Cert. No.:	
ph: (303) 237-2072	fax:	Date Reported:	3/19/2014

Client Sample ID: B8-Initial **SPL Sample ID:** 14030014-01A

Analyte	ppbv		ug/m3	
	Result	PQL	Result	PQL
TPH (C3-C12)	786000	40000	3210000	160000
TPH (C5-C12)	786000	40000	3210000	160000
TPH (C6-C10)	679000	40000	2770000	160000
Benzene	8870	800	28300	2600
Ethylbenzene	ND	800	ND	3500
m,p-Xylene	3520	800	15300	3500
o-Xylene	ND	800	ND	3500
Toluene	4770	800	18000	3000
Xylenes,Total	3520	800	17100	3500

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:		Project Name:	Oxy 705-43-22/Proj. 013-0242
Olsson Associates		Site:	Golden, CO.
Kevin Taylor		Site Address:	
4690 Table Mountain Drive #200			
		PO Number:	013-0242
Golden		State:	Colorado
Colorado		State Cert. No.:	
80403-		Date Reported:	3/19/2014
ph: (303) 237-2072 fax:			

Client Sample ID: B8-Final **SPL Sample ID:** 14030014-02A

Analyte	ppbv		ug/m3	
	Result	PQL	Result	PQL
TPH (C3-C12)	699	25	2860	100
TPH (C5-C12)	389	25	1590	100
TPH (C6-C10)	149	25	611	100
Benzene	0.749	0.5	2.39	1.6
Ethylbenzene	0.597	0.5	2.59	2.2
m,p-Xylene	2.08	0.5	9.02	2.2
o-Xylene	1.14	0.5	4.96	2.2
Toluene	4.68	0.5	17.6	1.9
Xylenes,Total	3.22	0.5	14.0	2.2

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:		Project Name:	Oxy 705-43-22/Proj. 013-0242
Olsson Associates		Site:	Golden, CO.
Kevin Taylor		Site Address:	
4690 Table Mountain Drive #200			
Golden		PO Number:	013-0242
Colorado		State:	Colorado
80403-		State Cert. No.:	
ph: (303) 237-2072	fax:	Date Reported:	3/19/2014

Client Sample ID: B5-Initial **SPL Sample ID:** 14030014-03A

Analyte	ppbv		ug/m3	
	Result	PQL	Result	PQL
TPH (C3-C12)	652000	40000	2670000	160000
TPH (C5-C12)	616000	40000	2520000	160000
TPH (C6-C10)	502000	40000	2050000	160000
Benzene	736	160	2350	510
Ethylbenzene	219	160	950	690
m,p-Xylene	390	160	1690	690
o-Xylene	ND	160	ND	690
Toluene	343	160	1290	600
Xylenes,Total	390	160	1990	690

ACCUTEST GULF COAST
10165 HARWIN DRIVE
HOUSTON, TX 77036
(713) 271-4700

Olsson Associates

Certificate of Analysis Number:

14030014

Report To:			
Olsson Associates Kevin Taylor 4690 Table Mountain Drive #200 Golden Colorado 80403- ph: (303) 237-2072 fax:		Project Name: Site: Site Address: PO Number: State: State Cert. No.: Date Reported:	Oxy 705-43-22/Proj. 013-0242 Golden, CO. 013-0242 Colorado 3/19/2014

Client Sample ID: B10-Final **SPL Sample ID:** 14030014-04A

Analyte	ppbv		ug/m3	
	Result	PQL	Result	PQL
TPH (C3-C12)	92800	8000	380000	33000
TPH (C5-C12)	93300	8000	382000	33000
TPH (C6-C10)	76800	8000	314000	33000
Benzene	ND	40	ND	130
Ethylbenzene	ND	40	ND	170
m,p-Xylene	124	40	537	170
o-Xylene	ND	40	ND	170
Toluene	52.1	40	196	150
Xylenes,Total	124	40	617.3	170

APPENDIX C

SVE SYSTEM DIESEL GENERATOR EMISSION CALCULATIONS

July 11, 2014

OXY USA WTP LP, OXY USA Inc.
760 Horizon Drive, Suite 101
Grand Junction, Colorado 81506

RE: Cascade Creek (CC) 705-22-43
Soil Vapor Extraction (SVE) System

To Whom This May Concern:

Olsson Associates (Olsson) was contracted by OXY USA Inc. (OXY) to evaluate air emissions for one (1) Soil Vapor Extraction (SVE) system and its associate diesel generator engine. The SVE system will be utilized to extract VOC vapors from the soil at the Cascade Creek (CC) 705-22-43 site in Garfield County, Colorado.

It has been determined, by Olsson, that the Wacker Neuson G25 diesel generator engine emissions will be below APEN reporting thresholds; therefore, OXY is not required to inform the Colorado Department of Public Health and Environment (CDPHE) of installation. In addition, the Soil Vapor Extraction system venting emissions are expected to be less than 2 tpy (VOC); therefore, OXY is not required to inform the CDPHE of installation. Diesel generator emission calculations are attached for reference.

The SVE system venting emissions results provided in the Summary Report (May 2014) assume no decline in VOC concentrations/emissions throughout the extraction period. VOC concentrations/emissions will decline throughout the extraction period and thus emissions are expected to remain below the 2 tpy APEN reporting threshold.

Please feel free to contact me with any questions or concerns.

Regards,

Peter Knell
Olsson Associates
pknell@olssonassociates.com
(303) 374-3109

Soil Vapor Extraction Generator Engine
Small Diesel (≤ 600 hp) Engine

Source ID	SVE Generator Unit
Description	Trailer Mounted Generator
Manufacturer	Wacker Neuson
Model	G25
Emission Control	Tier 4i

Fuel Heat Value	137000	Btu/gal
Design Output	35	hp
Site Output	35	hp
Potential Operation	8760	hr/yr
Potential Heat Rate	7050	Btu/hp-hr
Potential Heat Rate	0.25	MMBtu/hr
Potential Fuel Use	1.8	gal/hr
Potential Fuel Use	0.02	MMgal/yr

Potential to Emit

Pollutant	CAS Number	Emission Factor (lb/MMBtu)	Emission Factor (g/hp-hr)	(lb/hr)	(lb/yr)	(ton/yr)	Source of Emission Factor
NOx		4.41		1.09	9532.35	4.77	AP-42
CO		0.95		0.23	2053.45	1.03	AP-42
VOC		0.36		0.09	778.15	0.39	AP-42
SO2		0.29		0.07	626.84	0.31	AP-42
PM		0.31		0.08	670.07	0.34	AP-42
1,3-Butadiene	106-99-0	3.91E-05		9.65E-06	8.45E-02	4.23E-05	AP-42
Acetaldehyde	75-07-0	7.67E-04		1.89E-04	1.66E+00	8.29E-04	AP-42
Acrolein	107-02-8	9.25E-05		2.28E-05	2.00E-01	1.00E-04	AP-42
Benzene	71-43-2	9.33E-04		2.30E-04	2.02E+00	1.01E-03	AP-42
Formaldehyde	50-00-0	1.18E-03		2.91E-04	2.55E+00	1.28E-03	AP-42
Naphthalene	91-20-3	8.48E-05		2.09E-05	1.83E-01	9.16E-05	AP-42
Toluene	108-88-3	4.09E-04		1.01E-04	8.84E-01	4.42E-04	AP-42
Xylenes	1330-20-7	2.85E-04		7.03E-05	6.16E-01	3.08E-04	AP-42
Total HAPs				9.35E-04	8.19E+00	4.10E-03	

AP-42: NOx, CO, VOC, SO2, PM: EPA AP-42, Volume I, Fifth Edition, October 1996, Table 3.3-1.
HAPs: EPA AP-42, Volume I, Fifth Edition, October 1996, Table 3.3-2.

Soil Vapor Extraction Generator Engine
Small Diesel (≤ 600 hp) Engine Continued

Source ID	SVE Generator Unit
Fuel Heat Value	137000 Btu/gal
Design Output	35 hp
Site Output	35 hp
Potential Operation	8760 hr/yr
Potential Heat Rate	7050 Btu/hp-hr
Potential Heat Rate	0.25 MMBtu/hr
Potential Fuel Use	1.8 gal/hr
Potential Fuel Use	0.02 MMgal/yr

Actual Emissions

Pollutant	CAS Number	Emission Factor (lb/MMBtu)	Emission Factor (g/hp-hr)	(lb/hr)	(lb/yr)	(ton/yr)	Source of Emission Factor
NOx + NMHC		--	5.59	0.43	3780.35	1.89	EPA Tier 4i
CO		--	4.10	0.32	2772.26	1.39	EPA Tier 4i
SO2		0.29		0.07	626.84	0.31	AP-42
PM		--	0.22	0.02	151.21	0.08	EPA Tier 4i
1,3-Butadiene	106-99-0	3.91E-05		9.65E-06	8.45E-02	4.23E-05	AP-42
Acetaldehyde	75-07-0	7.67E-04		1.89E-04	1.66E+00	8.29E-04	AP-42
Acrolein	107-02-8	9.25E-05		2.28E-05	2.00E-01	1.00E-04	AP-42
Benzene	71-43-2	9.33E-04		2.30E-04	2.02E+00	1.01E-03	AP-42
Formaldehyde	50-00-0	1.18E-03		2.91E-04	2.55E+00	1.28E-03	AP-42
Naphthalene	91-20-3	8.48E-05		2.09E-05	1.83E-01	9.16E-05	AP-42
Toluene	108-88-3	4.09E-04		1.01E-04	8.84E-01	4.42E-04	AP-42
Xylenes	1330-20-7	2.85E-04		7.03E-05	6.16E-01	3.08E-04	AP-42
Total HAPs				9.35E-04	8.19E+00	4.10E-03	

AP-42: NOx, CO, VOC, SO2, PM: EPA AP-42, Volume I, Fifth Edition, October 1996, Table 3.3-1.
HAPs: EPA AP-42, Volume I, Fifth Edition, October 1996, Table 3.3-2.

APPENDIX D

BORING AND COMPLETION LOGS

BORING LOG: SB 612-1

OLSSON ASSOCIATES

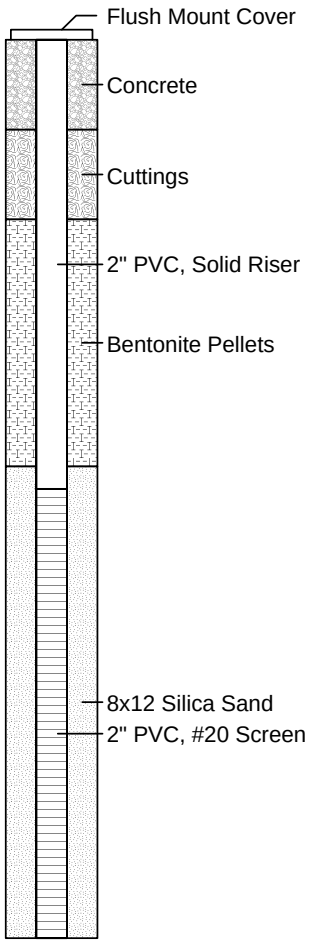
OXY USA, Inc.
705-22-43
Cascade Creek Field
Garfield County, Colorado
Olsson Project #013-0242

Date Started	: 6/12/14	Logged by:	: R. Stockton
Hole Diameter	: 6 5/8 in.	Depth to Product:	: Dry
Drilling Method	: HSA	Depth to Water:	: Dry
Drilling Company	: High Plains	Well Depth:	: 20'
Sampling Method	: Split Spoon	Coordinates:	: 12S 737074E 4373477N

Depth in Feet	Surf. Elev. 6125	USCS	GRAPHIC	DESCRIPTION	Samples	PID (ppm)
0	6125					
		CL		SILTY CLAY w/shale fragments, tan & gray, and low moisture. No staining, but has hydrocarbon odor.		
5	6120					
10	6115					1860
				SHALE, weathered to 12.5', then solid rock. difficult to drill. No stains in upper part of formation, but has hydrocarbon odor to ~13'.		372
15	6110					378
20	6105			TOTAL BORING DEPTH		
25	6100					
30						

Depth in Feet | Water Level

Well: SB 612-1



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BORING LOG: SB 612-2

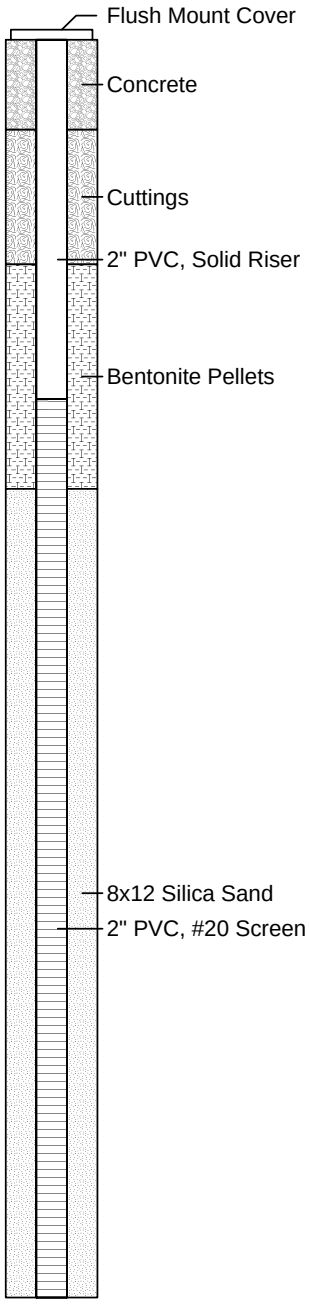
OLSSON ASSOCIATES

OXY USA, Inc.
705-22-43
Cascade Creek Field
Garfield County, Colorado
Olsson Project #013-0242

Date Started	: 6/12/14	Logged by:	: R. Stockton
Hole Diameter	: 6 5/8 in.	Depth to Product:	: Dry
Drilling Method	: HSA	Depth to Water:	: Dry
Drilling Company	: High Plains	Well Depth:	: 28'
Sampling Method	: Split Spoon	Coordinates:	: 12S 737072E 4373469N

Depth in Feet	Surf. Elev. 6124	USCS	GRAPHIC	DESCRIPTION	Samples	PID (ppm)
0	6124			SILTY CLAY w/shale fragments, tan & gray, and low moisture (moderately moist 20-22'). No staining, but has hydrocarbon odor.		
5	6119					
10	6114	CL				167
15	6109					
20	6104			SHALE, grey, weathered at top of formation. No stains, but has strong hydrocarbon odor.		1624
25	6099					
30				TOTAL BORING DEPTH		

Well: SB 612-2



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BORING LOG: SB 612-3

OLSSON ASSOCIATES

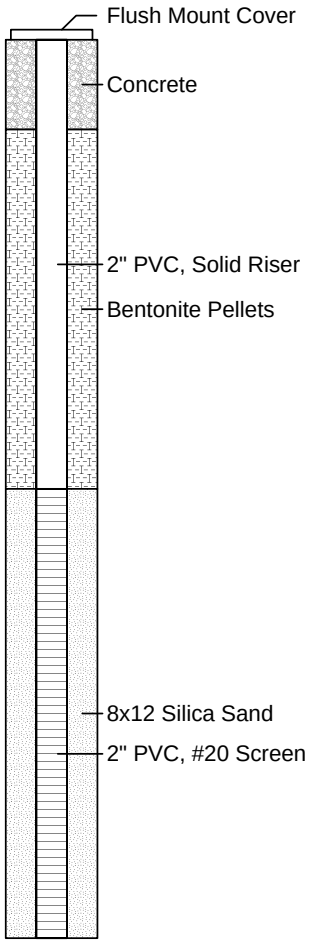
OXY USA, Inc.
705-22-43
Cascade Creek Field
Garfield County, Colorado
Olsson Project #013-0242

Date Started	: 6/12/14	Logged by:	: R. Stockton
Hole Diameter	: 6 5/8 in.	Depth to Product:	: Dry
Drilling Method	: HSA	Depth to Water:	: Dry
Drilling Company	: High Plains	Well Depth:	: 20'
Sampling Method	: Split Spoon	Coordinates:	: 12S 737070E 4373475N

Depth in Feet	Surf. Elev. 6124	USCS	GRAPHIC	DESCRIPTION	Samples	PID (ppm)
0	6124	CL		SILTY CLAY w/shale fragments, tan & gray, and slightly moist. No staining, but has hydrocarbon odor.		
5	6119					
10	6114					14.2
15	6109			SHALE, weathered to 12.5', then solid rock. Refusal at 28'. No stains, but has hydrocarbon odor.		572
20	6104			TOTAL BORING DEPTH		
25	6099					
30						

Depth in Feet | Water Level

Well: SB 612-3



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APPENDIX E

SVE SYSTEM SPECIFICATIONS

Fliteway Technologies, Inc.
2129 E. Birchwood Ave • Cudahy, WI 53110
(414) 483-5600 • 1-800-236-3580 • FAX (414) 483-1957

- **SVE System rated for 720 SCFM at 28" W.C.**

Fliteway FV710117X3-R59 with the following equipment

- **10 HP Explosion Proof 208- 230/460 3 Phase 1740** RPM motor
- **Roots 59 URAI or Gardner Denver Sutorbilt model 5L** positive displacement rotary lobe vacuum pump with Blower manufacturers **18 month warranty**
- **Fliteway "Cyclonic Action" 117 Gallon Vertical** knockout tank, carbon steel with site gauge, 6" cleanout, and bottom drain.
- 4" **inlet**, with vacuum gauge, and sample port.
- 4" Premium 10 micron inline filter between tank and vacuum pump.
- Mini Magnehelic to monitor differential pressure across filter element.
- 4" Premium carbon steel discharge silencer,temperature gauge, and sample port
- 4" Averaging Pitot Tube Flow Sensor with Magnehelic Gauge on Discharge
- Vacuum relief valve on inlet side of pump, field adjustable
- HHL Switch
- Dilution valve with filter
- 4" Inlet Header with Five (5) 4" Ports
    - Five (5) 4" Gate Valves
    - Five (5) Sample Ports
    - Five (5) Vacuum Gauges
    - Five (5) Sample Ports for insertion of 4" Averaging Pitot Tube Flow Sensor
    - One (1) 4" Averaging Pitot Tube Flow Sensors with Magnehelic Gauges

- **NEMA 4 Control Panel (240/208 VAC Three Phase, 4 Wire)**

- NEMA 4 Box with inner panel
- 100 Amp Fused Disconnect
- Circuit breakers for branch circuit protection
    - Trailer Heater
    - Trailer Vent Fan
- Starters and overload protection for:
    - 10 HP SVE
- HOA switch

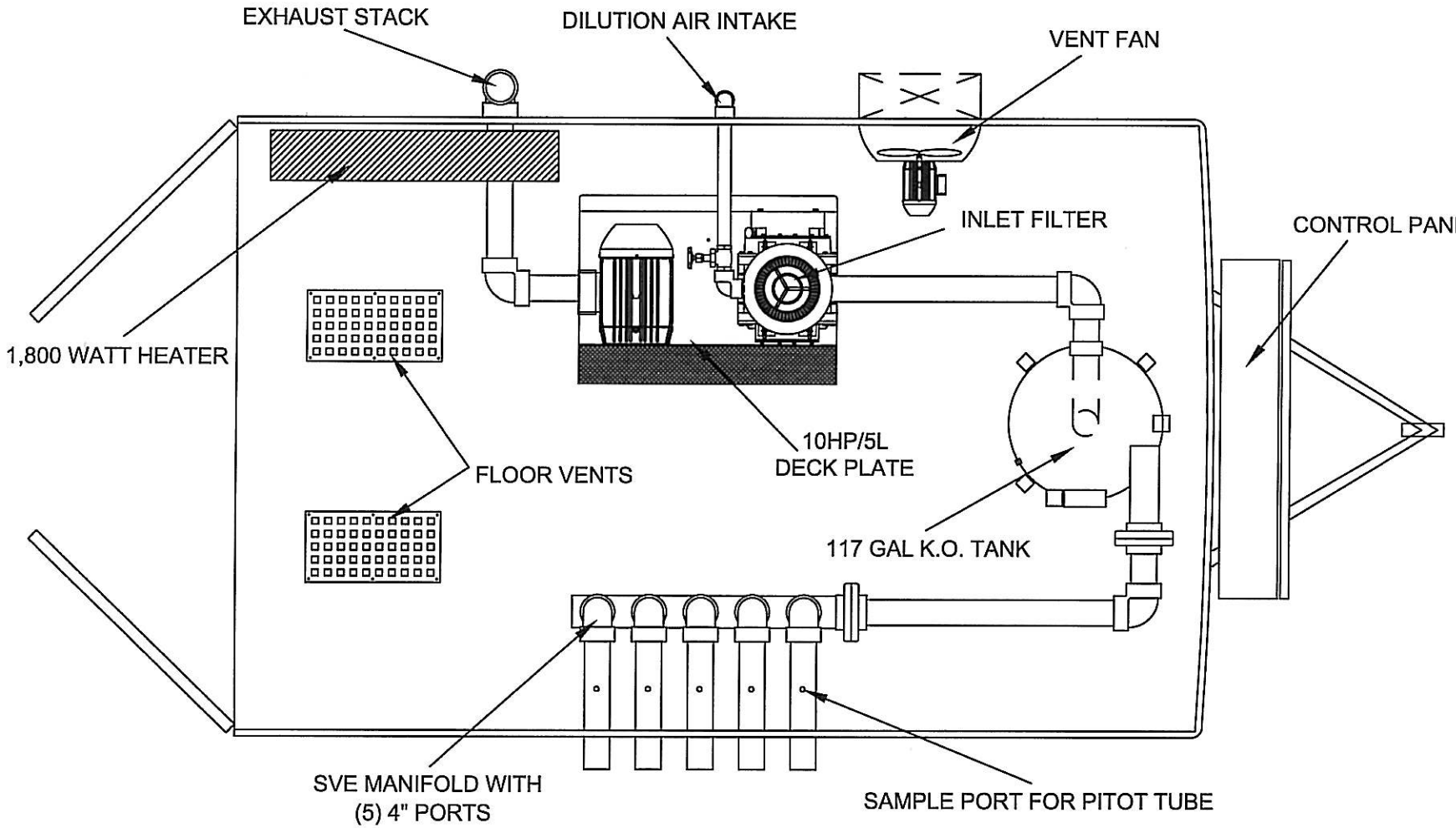
- SVE
- Hour meter
- Program Timer for SVE
- Run lights
- Two (2) Alarm Lights
  - SVE HHL
  - SVE Motor Fault
- One (1) Dual Intrinsically Safe Switch Repeater
- **Sensaphone 2000** auto dialer with battery backup
- Surge Protection
- Lightning Protection
- Control Box heater with thermostat
- GFI Receptacle
- UL Certification

- **Enclosed Trailer:**

Pace American Model CS812TA2 Interior Dimensions: 8' wide by 12.5' Long by 6'5" Tall Dual Axle 7,000 pound GVWR with 4,500 pound payload capacity

- All Wheel Electric Brakes with 12 VDC Breakaway switch
- Independent torsion suspension
- Double Swing Rear Doors with Semi-Style Camlocks
- Double Layer ¾" Plywood Floor
- 3/8" interior Plywood Walls
- Three (3) Year Trailer Warranty
- Floor Vents with removable steel covers
- Front and Rear Stabilizer Jacks
- Spare Tire
- 1" Thermal Insulation inside interior walls
- 1,800 Watt Explosion Proof Heater and Thermostat
- Hazardous Location Vent fan with Thermostat
- Two (2) Hazardous Location Lights
- Installation of all equipment per Class 1 Div 2 Hazardous ocation
- Unistrut installed on wall of trailer near roof to be used for SVE exhaust support
- 12' High Exhaust Stack with rain Cap

- **Maintenance Items**
  - **One (1) Quart PD Blower Oil**
  - **Two (2) SVE Filter Elements**
- **One (1) Day On Site Startup Assistance**
- **One (1) Year Warranty against defects in workmanship or materials**

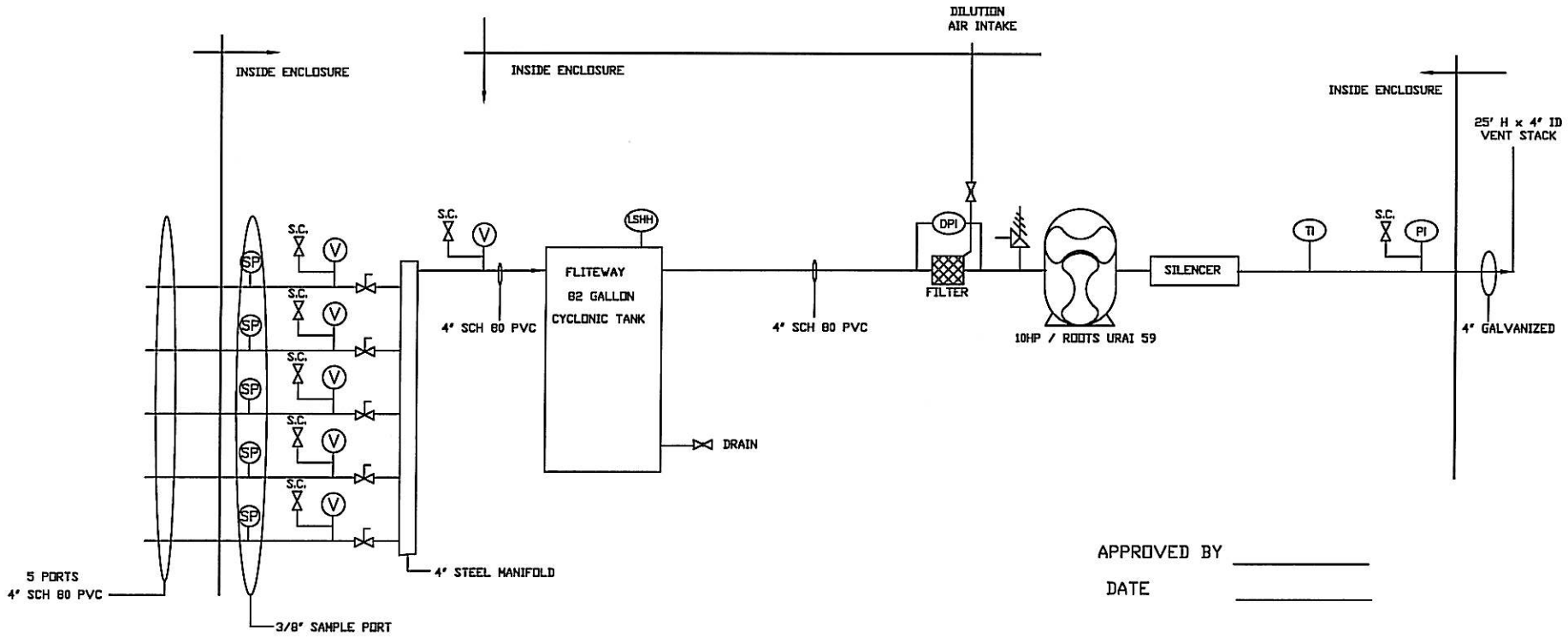


APPROVED BY_____

DATE _____

ITEM	QTY	8'X12'6" TRAILER	PART/MAT'L NO.
INITIAL		DATE	FLITEWAY TECHNOLOGIES
DRAWN BY KEVIN FEIKL		8/23/07	2129 EAST BUIRCHWOOD AVENUE CUDAHY, WI 53110
CHECKED			
ENGINEERING			OLSSON ASSOCIATES
TECH APPROVED			
TECH NO.		SCALE NONE	SIZE A Q13520 REV 2 REV
SIMILAR TO		WEIGHT	UNIT TYPE CAD FILE NO. SHEET OF

DO NOT SCALE DRAWING



APPROVED BY _____

DATE _____

S.C. SAMPLE CONNECTION/PORT

BALL VALVE

GATE VALVE

PRESSURE RELEIF VALVE

(DPI) DIFFERINTIAL PRESSURE INDICATOR

(LSHH) LEVEL SWITCH HIGH-HIGH LEVEL

(TI) TEMPERATURE INDICATOR

(PI) PRESSURE INDICATOR

(V) VACUUM INDICATOR

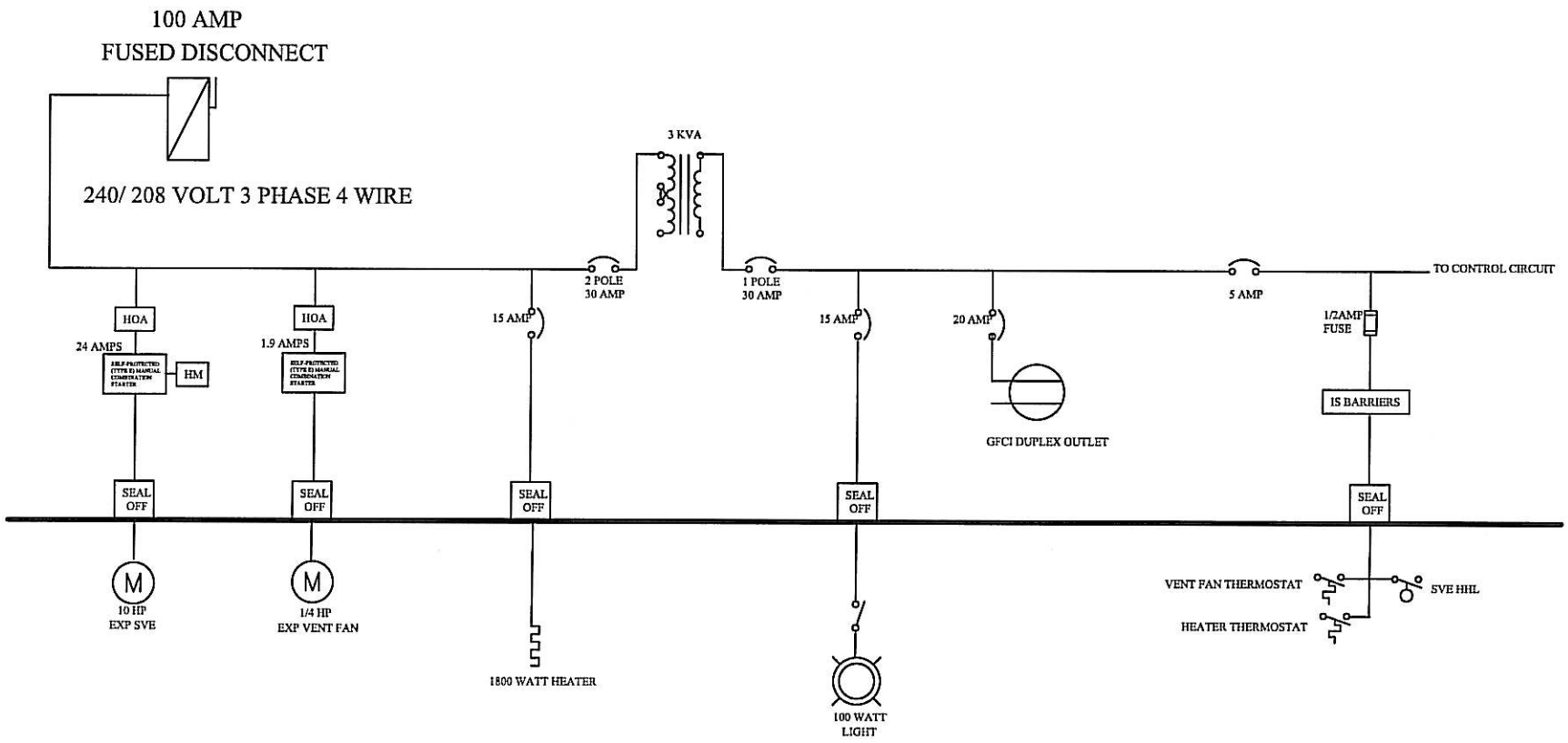
(SP) SAMPLE PORT PITOT TUBE

Fliteway Technologies, Inc
2129 EAST BIRCHWOOD AVE
CUDAHY WI, 53110
414.483.5600 414.483.1957

SVE MODEL FV158X3-R59 PROCESS AND INSTUMENTATION DIAGRAM

OLSSON ASSOCIATES

8/23/07	SIZE	FSCM NO.	DWG NO. Q13520 REV 2 REV
	SCALE NONE		SHEET 1 OF 1



8/23/07

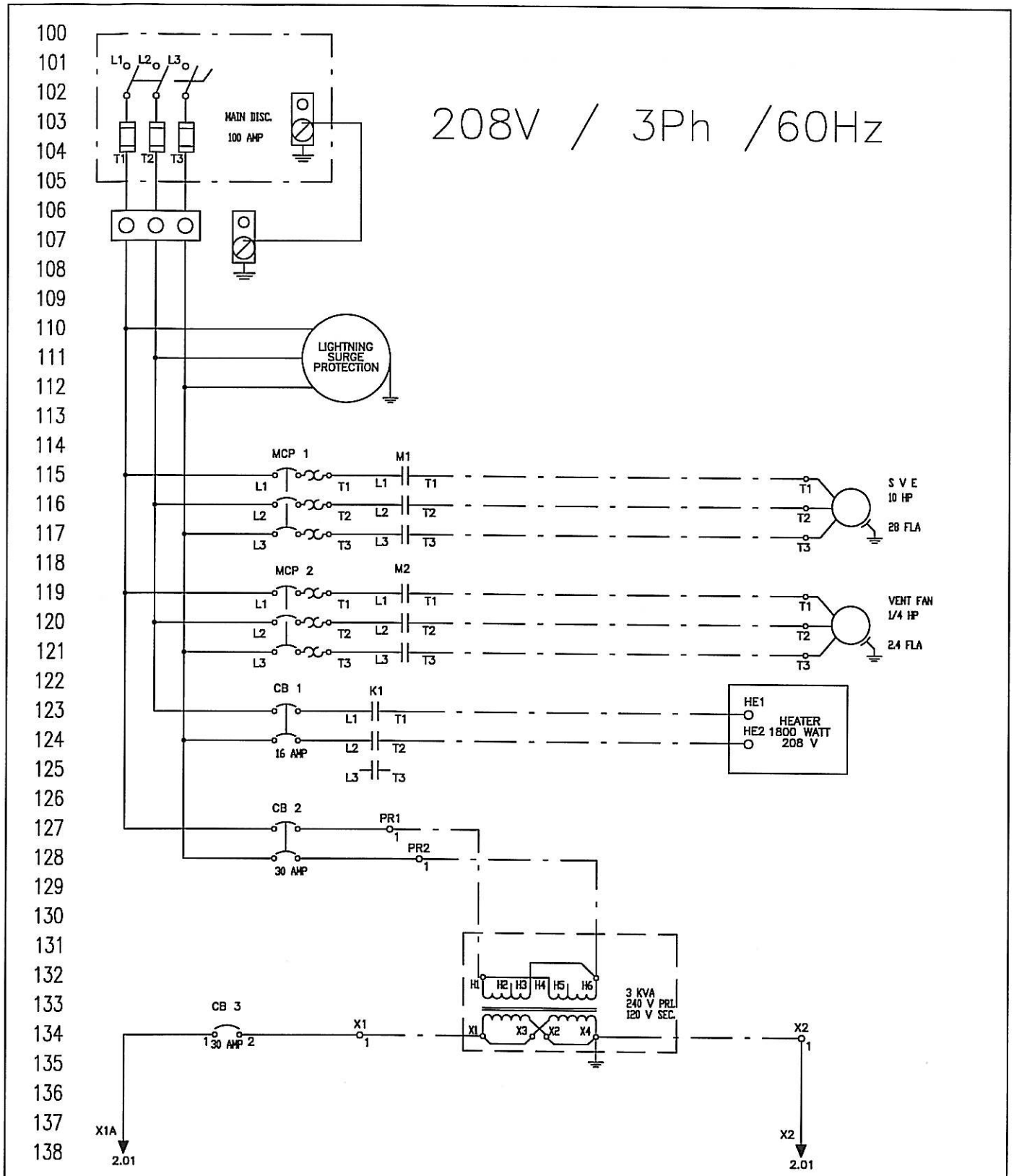
ONE LINE ELECTRICAL DIAGRAM

Olsson Associates

SIZE	FSCM NO.	DWG NO.	REV
		Q13520 REV 2	

SCALE NONE

SHEET



	DATE	NAME
DRAWN BY	08/28/07	JIM
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2129 E. Birchwood Ave.
Cudahy, WI 53110
414-483-5600

PROJECT: Q13520R2 OLLSON AND ASSC.

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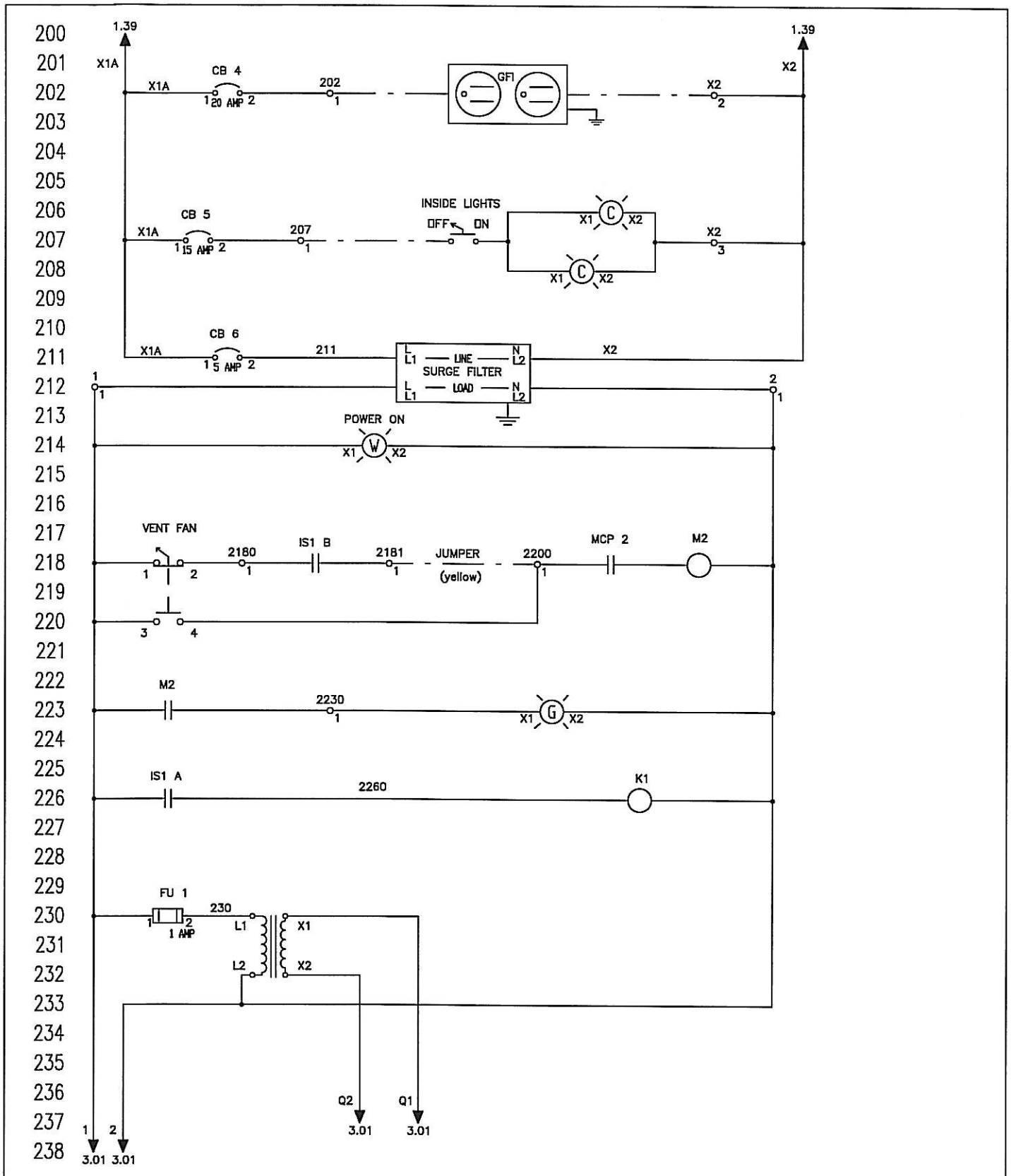

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DRAWN BY	08/28/07	JIM	2129 E. Birchwood Ave. Cudahy, WI 53110 414-483-5600		JOB-NO.:
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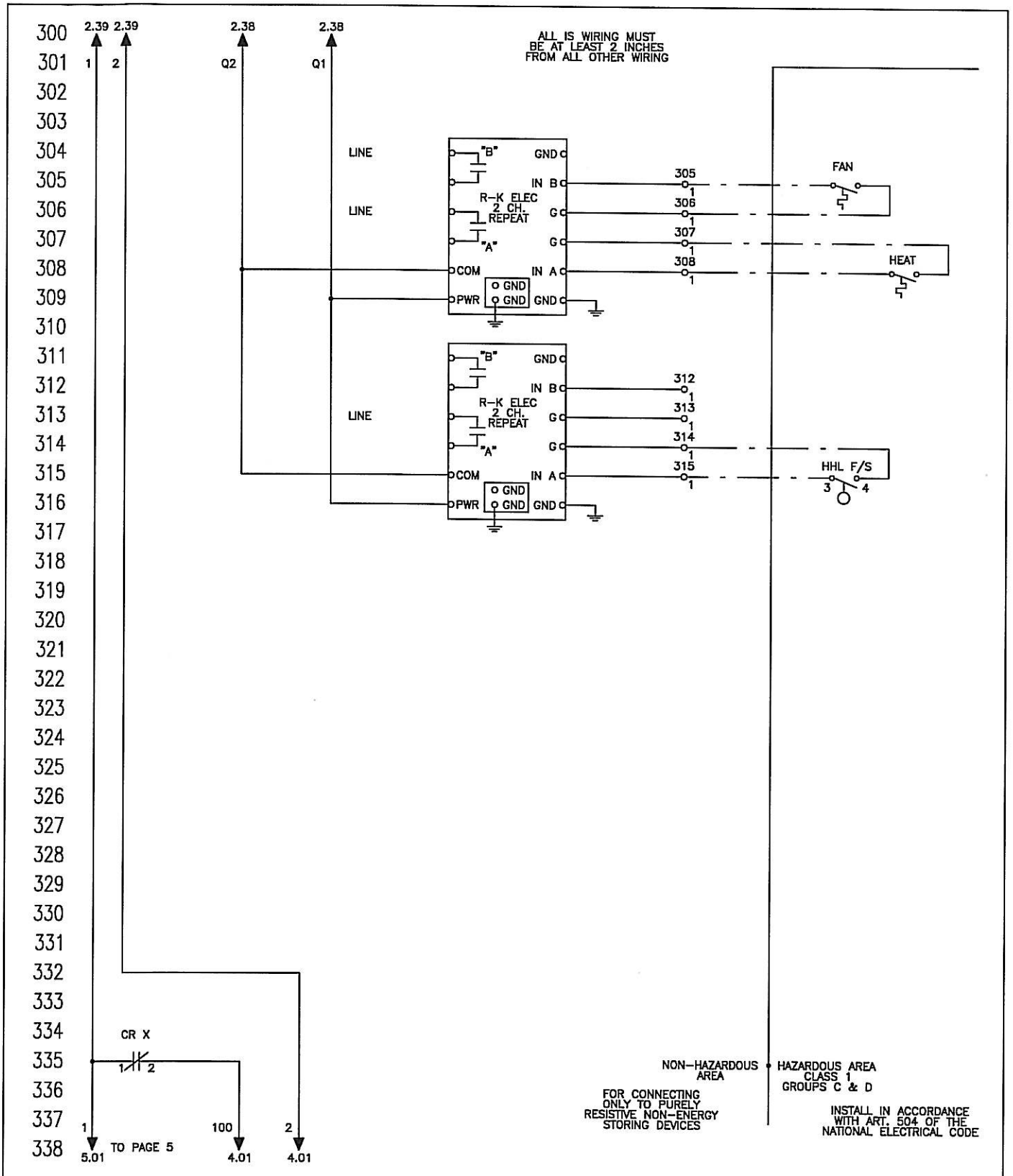

	DATE	NAME
DRAWN BY	08/28/07	JIM
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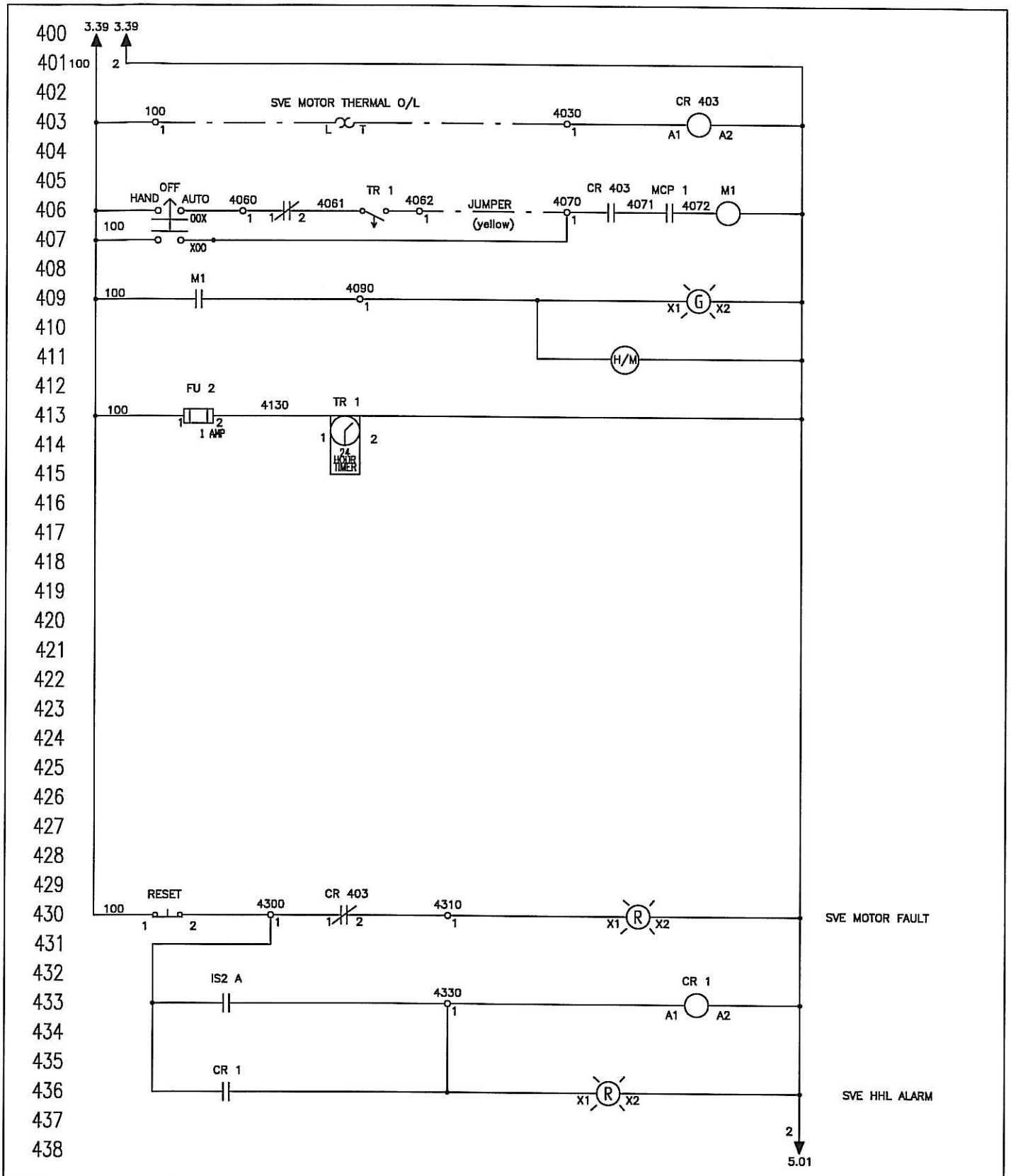

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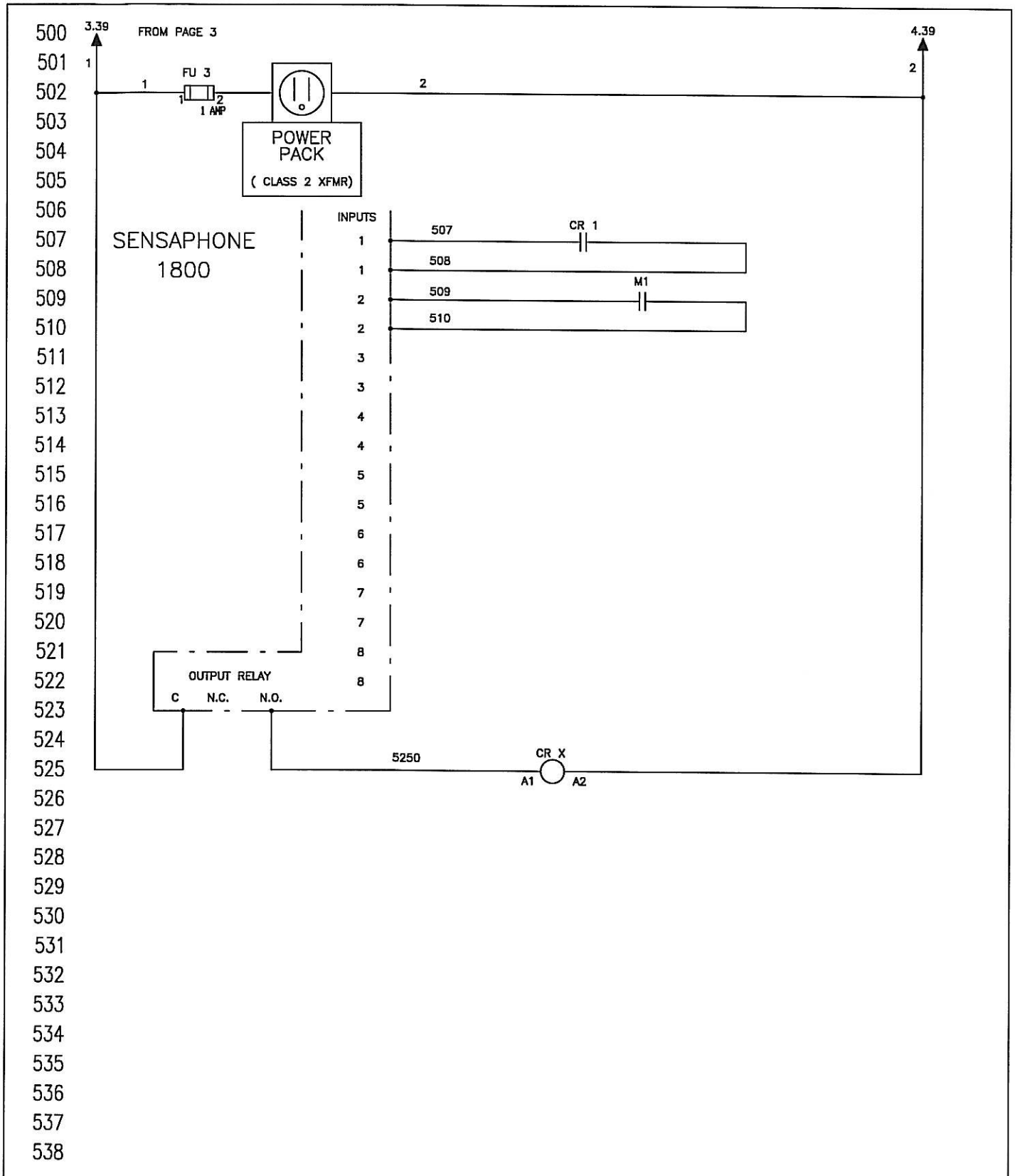

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