March 5, 2001

MEMORANDUM

TO:       James Johnston, Regional Administrator  
           Idaho Falls Regional Office

FROM:    Jorge Garcia  
           Air Quality Analyst, IFRO

SUBJECT:  PERMIT TO CONSTRUCT TECHNICAL ANALYSIS  
           P-000535, Simmons' True Value Hardware, Roberts  
           (Soil Vapor Treatment System)

PURPOSE

The purpose for this memorandum is to set out the legal and technical bases that satisfy the requirements of IDAPA 58.01.01.200 (Rules for the Control of Air Pollution in Idaho) for issuing Permits to Construct (PTC).

PROJECT DESCRIPTION

Rocky Mountain Environmental has submitted a PTC application for the construction of a soil vapor treatment System (SVE) to be used to treat petroleum contaminated soil. The SVE will be constructed at the former Simmons' True Value Hardware site, which is located in the city of Roberts, Idaho.

Rocky Mountain Environmental proposes the use of an electric catalytic oxidizer for the destruction of gaseous waste. The objective of a catalytic incinerator is to destroy organic components of a gas stream at temperatures lower than those required for direct combustion. The organic components to be destroyed are benzene, toluene, ethylbenzene and xylene (BTEX). DEQ has determined that the electric catalytic oxidizer represents reasonable available control technology for toxic air pollutants (T-RACT).

SUMMARY OF EVENTS

On January 31, 2001, DEQ received a PTC application from Rocky Mountain Environmental for the construction of a Soil Vapor treatment System. The application was determined complete on February 26, 2001.
DISCUSSION:

1. Equipment Description
   1.1. Catalytic Oxidizer
   1.2. Stack Height (ft): 10.5
   1.3. Stack Diameter (ft): 0.83
   1.4. Stack Gas Flowrate (scfm): 400
   1.5. Stack Temperature (°F): 300
   1.6. BTEX Control Efficiency (%): 99

2. Area Classification
   The proposed facility is located in Roberts, Idaho. The city of Roberts is located in Jefferson County, which is located in Jefferson County, Air Quality Control Region 61 and Zone 12. The area is designated as an attainment or unclassifiable area for all regulated criteria air pollutants.

3. Facility Classification
   The Facility is not a major facility as in IDAPA 58.01.01.006.55 nor is it a designated facility as defined by IDAPA 58.01.01.006.27. The Facility is not subject to federal New source Performance Standards (NSPS) in accordance with 40 CFR Part 60, National Emission Standards for Hazardous Air Pollutants (NESHAP) in accordance with 40 CFR Part 61, or National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT Standards) in accordance with 40 CFR 63. The SIC code for this Facility is 5541 and it is classified as SM.

4. Emission Estimates
   4.1. Uncontrolled Mass Emission Rate (E)
      Where: E = Concentration x flowrate
      Given:
      Concentration (C) of benzene from lab results of sample taken during pilot study
      C = 320 mg/m³ at 20 °C and 760 torr
      \[ E = \frac{320 \text{ mg/m}^3 \times 400 \text{ ft}^3/\text{min} \times 1\text{g/1000mg} \times 1 \text{ m}^3/35.31 \text{ ft}^3 \times 1\text{min}/60\text{sec}}{1 \text{ sec}} \]
      \[ E = 0.0604 \text{ g/sec} \]
      Considering 99. % efficiency of the catalytic oxidizer the uncontrolled emission rate will be:
      \[ E = 0.0604 \text{ g/sec} \times (1 - 0.99) = 0.01 \times 0.0604 \text{ g/sec} = 0.000604 \text{ g/sec} \]

   4.2 Acceptable Ambient Concentration (AAC).
      The acceptable ambient Concentration (AAC) for Benzene is: 0.12 μg/m³ as an annual average. (IDAPA 58.01.01.586)
      Actual Ambient Concentration
      The actual ambient Concentration © was obtained by modeling the mass emission rate left uncontrolled by the catalytic oxidizer operation. (Appendix A). The hourly concentration obtained using the Screen3 model © is:
© = 1.118 μg/m³ x 0.125 (persistent factor) = 0.1398 μg/m³ which is greater than the acceptable ambient concentration. As a consequence, the regulatory model ISCT3 (Appendix A) was used by DEQ to determine the actual annual concentration.

The model run used real-time meteorological data taken approximately at 50 km from the city of Roberts and the UTM coordinates of several receptors around the SVE location.

The highest annual ambient concentration according to ISCT3 is 0.007 μg/m³, lower than the acceptable ambient concentration limit for Benzene therefore:

The allowable emission rate E = 0.05 lb/hour.

5. **Modeling Analysis**

Please refer to the attached (appendix A) model results obtained by using EPA approved regulatory model Screen3 and ISCST3.

6. **Regulatory Review**

   6.1 **IDAPA 58.01.01.201 PTC Required**

   A PTC is required for this project because it does not meet the exemption requirements specified in IDAPA 58.01.01.220 through .223.

   6.2 **IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards**

   Compliance with toxic standards has been demonstrated.

   6.3 **IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants**

   Compliance with the NAAQS has been demonstrated.

   6.4 **Prevention of Significant Deterioration**

   Not applicable.

   6.5 **New Source Performance Standards 40 CFR 60**

   Not applicable.

   6.6 **National Emission Standards for Hazardous Air Pollutants 40 CFR 61**

   Not applicable. The concentration of benzene in gasoline is less than 10% by weight; therefore 40 CFR 61, Subpart J - National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene - does not apply. There are no NESHAP requirements that apply to toluene, ethylbenzene, or xylene for this source type.

   6.7 **Maximum Achievable Control Technology Standards 40 CFR 63**

   Not applicable.
7. Permit Requirements

7.1. Catalytic Oxidation System

7.2.1 Benzene Emission Rate Limit

Benzene stack emissions are limited to 0.05 lb/hr to protect the ambient standard set for benzene (0.12 ug/m3). Protecting benzene’s ambient standard inherently protects the ambient standards for toluene, ethylbenzene, and xylene.

7.2.2 Catalytic Bed Temperature and Flowrate

The Permittee is required to maintain the catalytic bed temperature above 600 (°F) and a pressure drop through the catalyst bed according to manufacturer’s specifications to ensure a destruction and removal efficiency of 99.0%. Maintaining this temperature and pressure drop assures that benzene emissions will not exceed 0.05 lb/hr.

8. AIRS

The information required for the AIRS database is presented as Appendix B of this document.

9. FEES

This facility is a not a major facility as defined by IDAPA 58.01.01.008.10; therefore registration and registration fees in accordance with IDAPA 58.01.01.525 do not apply.

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, staff recommends that Rocky Mountain Environmental be issued PTC # 051-00018 for the construction of the soil vapor treatment system identified in this technical analysis and in the permit application. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

JG/jg

Attachments

Cc: Idaho Falls Regional Office
    DEQ State Office
    EPA.
Appendix A
03/02/01

10:56:55

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SVE-RO

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = 0.60000E-03
STACK HEIGHT (M) = 3.2004
STK INSIDE DIAM (M) = 0.2539
STK EXIT VELOCITY (M/S) = 3.7286
STK GAS EXIT TEMP (K) = 422.0389
AMBIENT AIR TEMP (K) = 293.1500
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = 0.0000
MIN HORIZ BLDG DIM (M) = 0.0000
MAX HORIZ BLDG DIM (M) = 0.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 0.180 M**4/S**3; MOM. FLUX = 0.156 M**4/S**2.

*** FULL METEOROLOGY ***

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*** SCREEN AUTOMATED DISTANCES ***
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Maximum 1-hr concentration at or beyond 1.0 mg/L:

- 45.00 mg/L
- 3.70 mg/L

**DWASH** = MEANS NO CALC MADE (CONC = 0.0)
**DWASH**=NO MEANS NO BUILDING DOWNWASH USED
**DWASH**=HS MEANS HUBER-SNYDER DOWNWASH USED
**DWASH**=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
**DWASH**=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*********** SUMMARY OF SCREEN MODEL RESULTS ***********

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<th>Calculation Procedure</th>
<th>MAX Conc (UG/M**3)</th>
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<th>Terrain HT (M)</th>
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Page 4
NO ECHO

BEE-Line ISCST3 "BEEST" Version 8.10

Input File - Q:\trapm10\BZanual.DTA

Output File - Q:\trapm10\BZanual.LST

Met File - Q:\GR10_2YR.ASC

****************************
*** SETUP Finishes Successfully ***
****************************
*** MODELOPTs:

CONC  RURAL  ELEV  DEFAULT

IONS SUMMARY

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCeNtration Values.

--- SCAVENGING/DEPOSITION LOGIC ---

**Model Uses NO DRY DEPLETION.  DDPLETE = F
**Model Uses NO WET DEPLETION.  WDPLETE = F
**NO WET SCAVENGING Data Provided.**
**NO GAS DRY DEPOSITION Data Provided.**
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations**

**Model Uses RURAL Dispersion.**

**Model Uses Regulatory DEFAULT Options:**
1. Final Plume Rise.
2. Stack-tip Downwash.
4. Use Calms Processing Routine.
6. Default Wind Profile Exponents.
9. No Exponential Decay for RURAL Mode

**Model Accepts Receptors on ELEV Terrain.**

**Model Assumes No FLAGPOLE Receptor Heights.**

**Model Calculates ANNUAL Averages Only**

**This Run Includes:** 1 Source(s); 1 Source Group(s); and 7 Receptor(s)

**The Model Assumes A Pollutant Type of: BENZENE**

**Model Set To Continue RUNning After the Setup Testing.**

**Output Options Selected:**
Model Outputs Tables of ANNUAL Averages by Receptor
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)

**NOTE:** The Following Flags May Appear Following CONC Values: c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours
**Misc. Inputs: Anem. Hgt. (m) = 10.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 1.2 MB of RAM.

**Input Runstream File: Q:\trapm10\BZNanual.DTA

**Output Print File: Q:\trapm10\BZNanual.LST
### SION 00101 ***  SVE Roberts ***

#### 03/06/01

### CATOX Benzene Emissions ***

### 11:04:33

**MODELOPTs:**

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#### DATA ***

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<td>X</td>
<td>Y</td>
<td>ELEV.</td>
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*** SOURCE GROUPS ***

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</table>
oberts
* 03/06/01

**MODELOPTs:

CONC RURAL ELEV DEFAULT

RECEPTORS ***

ELEV, ZFLAG)

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0.0, 4841250.0, 1456.0, 0.0); ( 40894
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( 409320.0, 4840840.0, 1456.9, 0.0); ( 40896
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**SELECTED FOR PROCESSING***

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</table>

**METEOROLOGICAL DAYS**

(1=Y)

**METEOROLOGICAL DATA PROCESSED BETWEEN START**

DATE: 1997 1 1 0

**AND END**

DATE: 1998 12 31 24

**NOTE:** METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

**UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES***

(METERS /SEC)
**EXPOSURE TO WIND**

**STABILITY**

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**WIND SPEED CA**

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**TEMPERATURE GRADIENTS**

**STABILITY**

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**WIND SPEED CA**

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RSION 00101 *** *** SVE Roberts
*** 03/06/01
*** CATOX Benzene Emissions
*** 11:04:33

**MODELOPTs:

CONC RURAL ELEV DEFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA

FILE: Q:\GR10_2YR.ASC

FORMAT: FREE

SURFACE STATION NO.: 0 UPPER AIR STATION NO.: 0
NAME: UNKNOWN YEAR: 1997

YEAR: 1997

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*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
*** CATOX Benzene Emissions ***

03/06/01
11:04:33

**MODELOPTS:

CONC RURAL ELEV DEFAULT

*** THE ANNUAL ( 2 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***

INCLUDING SOURCE(S): GENALL

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF BENZENE IN MICR OGRAMS/M**3 **

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MODELOPTs:

CONC

RURAL ELEV DEFAULT

03/06/01

CATOX Benzene Emissions

11:04:33
*** THE SUMMARY OF MAXI

** CONC OF BENZENE IN MICR **

<table>
<thead>
<tr>
<th>GROUP ID</th>
<th>AVERAGE CONC OF TYPE</th>
<th>RECEPTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(XR, YR, ZELEV, ZFLAG)</td>
<td>GRID-ID</td>
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<tr>
<td>ALL</td>
<td>1ST HIGHEST VALUE IS</td>
<td>0.00731 AT (409140.00, 4841)</td>
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<tr>
<td>010.00,</td>
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</tr>
<tr>
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<td>1456.94, 0.00) DC</td>
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<tr>
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<td>850.00,</td>
<td>1456.94, 0.00) DC</td>
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<td>0.00,</td>
<td>0.00, 0.00)</td>
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</tbody>
</table>

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY
**MODELOPTs:**

CONC  RURAL  ELEV  DEFAULT

*** Message Summary : ISCST3 Model Execution ***

-------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 0 Informational Message(s)

******* FATAL ERROR MESSAGES *******

*** NONE ***

******* WARNING MESSAGES *******

*** NONE ***

---------------------------------------------------------------

*** ISCST3 Finishes Successfully ***

---------------------------------------------------------------
February 26, 2001

Mr. Jim Johnston PE
Regional Administrator
Idaho Falls Regional Office DEQ
900 North Skyline, Suite B
Idaho Falls, ID 83402-1718

RE: CAT OX Operation, City of Roberts, Idaho
IDEQ Permit Number 777-00274

Dear Jim:

Sue and I wish to express our gratitude for all the guidance and support that Ms. Jewell and Messrs. Heaton and Garcia have provided to us, as we begin operation of the H2Oil Recovery Catalytic oxidizer in Roberts. During the last several weeks, their help has been invaluable.

Since issuance of your letter dated February 1, 2001, granting us permission to commence operations, several issues have arisen. This letter answers several questions posed by the IFRO staff and provides the information currently available to us:

1. Stack Height is 10.5 ft above ground.
2. Stack Diameter is 10 in.
3. At 1500 rpm, the roots blower is expected to produce 400 cfm. Refer to the attached blow specification chart.
4. The H2 Oil Recovery equipment is not configured to record flow rate in CFM. Rather, we propose to record the operating pressure [in inches] on the positive side of the blower. This measurement will allow us to use the blower specification chart to estimate the volume [CFM] discharged by the blower into the burner chamber.

5. The H2 Oil Recovery equipment is not configured to meet the requirement in §3.1 of IDEQ's February 1, 2001 draft Permit to Construct, i.e., measurement and recording the inlet and outlet temperatures. Our model has only one temperature measurement device, i.e., the rustrack® strip-chart recorder. This strip-chart recorder meets the requirement for an inlet temperature monitoring device, specified at §2.1 in IDEQ's February 1, 2001 draft Permit to Construct.

6. Finally, we plan to collect vapor samples from the positive side of the blower and analyze each for BTEX+MTBE. The vapor concentration, discharge in CFM, and the record of elapsed time will allow us to calculate a total mass [lbs or kg] of petroleum products removed and destroyed.

The cold weather in January and early February created frost that extended four [4] feet into the ground. The deep frost limited the ability to excavate for free product removal. Assuming spring arrives, this is our current schedule for remediation in Roberts:

      i. Free product will be collected in a 2.000 gal tank and held for recycling.
      ii. Petroleum contaminated soils will be land farmed in the IDEQ-approved application site.

   b. March 26, 2001. Commence operation of the Cat Ox. To reduce electrical consumption, we plan to remove as much free product as possible. This will allow us to focus our efforts on removing petroleum products from soil beneath East Market Lake and destruction of vapors from that area in the H2 Oil Recovery catalytic oxidizer.

Sue and I hope that this information provides the information that Ms. Jewell and Messrs. Heaton and Garcia require. As additional questions will arise, please call me at Rocky Mountain Environmental\textsuperscript{SM}. 

\textsuperscript{SM} Rocky Mountain Environmental
Thank you for your assistance in this matter.

Sincerely,

James D. Rush, PG
Vice President
e-mail: jrush@rockymountainenvironmental.com

cc via fax

Mr. Ted Hendricks
East Central Idaho Planning & Development Association, Inc.
310 North 2nd East, #115
Rexburg, ID 83440-1604

Ms. Barbara Jewell
Idaho DEQ
900 North Skyline, Suite B
Idaho Falls, ID 83402-1718

Mr. Ben Poston, Mayor
City of Roberts, 2868 E 564 N
Roberts, ID 83444

Mr. Steve Heaton, Idaho Regional Office
Idaho DEQ
900 North Skyline, Suite B
Idaho Falls, ID 83402-1718

Mr. David Simmons
1616 East 1500 North
Tetonia, ID 83450
Permit to Construct Handoff – Rocky Mountain Environmental
City, Idaho Falls
Date: 03-12-01

<table>
<thead>
<tr>
<th>NAME</th>
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<tr>
<td>[Signature]</td>
<td>Rocky Mt. Environmental</td>
<td>527-2353</td>
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<tr>
<td>Jose G. Garcia</td>
<td>DEQ</td>
<td></td>
</tr>
<tr>
<td>[Signature]</td>
<td>DEQ</td>
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