ATTACHMENT 13

AIR POLLUTANT EMISSION NOTICE (APEN) APPLICATION

Form APCD-100

Colorado Department of Public Health and Environment
Air Pollution Control Division

Colorado Department of Public Health and Environment

Oil & Gas Industry
Construction Permit Application Completeness Checklist

Ver. September 28, 2009

Company Name: GreenBack Produced Water Recovery, LLC

Source Name: Shaeffer Ranch Facility

Date: March 15, 2010

	Yes	No
Are you requesting a facility wide permit for multiple emissions points?	☐	☒

In order to have a complete application, the following attachments must be provided, unless stated otherwise. If application is incomplete, it will be returned to sender and filing fees will not be refunded.

Attachment	Application Element	Applicant	APCD
A	APEN Filing Fees	☒	☐
B	Air Pollutant Emission Notice(s) (APENs) & Application(s) for Construction Permit(s) – **APCD Form Series 200**	☒	☐
C	Emissions Calculations and Supporting Documentation	☒	☐
D	Company Contact Information - **Form APCD-101**	☒	☐
E	Ambient Air Impact Analysis	☐	☐
	☒ Check here if source emits only VOC (Attachment E not required)		
F	Facility Emissions Inventory – **Form APCD-102**	☒	☐
	☐ Check here if single emissions point source (Attachment F not required)		
G	Process description, flow diagram and plot plan of emissions unit and/or facility	☒	☐
	☐ Check here if single emissions point source (Attachment G not required)		
H	Operating & Maintenance (O&M) Plan – **APCD Form Series 300**	☒	☐
	☐ Check here if true minor emissions source or application is for a general permit (Attachment H not required)		
I	Regulatory Analysis	☐	☐
	☒ Check here to request APCD to complete regulatory analysis (Attachment I not required)		
J	Colorado Oil and Gas Conservation Commission (COGCC) 805 Series Rule Requirements– **Form APCD-105**	☐	☐
	☒ Check here if source is not subject to COGCC 805 Series requirements (Attachment J not required)		

Send **Complete** Application to:

Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Check box if facility is an existing Title V source: ☐ Send an additional application copy
Check box if refined modeling analysis included: ☐ Send an additional application copy

Air Pollution Control Division (APCD) - Construction Permit Application

PLEASE READ INSTRUCTIONS ON REVERSE SIDE.

1. Permit to be issued to: GreenBack Produced Water Recovery, LLC
2. Mailing Address: 1900 Grant Street, Suite 630
   Denver, Colorado 80203
3. General Nature of Business: Commercial Produced Water Recycle Facility
   SIC code (if known)
4. Air Pollution Source Description: Multiple Emission Sources
   (List permit numbers if existing source, attach additional pages if needed)
   Is this a Portable Unit? Yes (No)
5. Source Location Address (Include Location Map) If portable, include the initial location and home base location
   NE1/4, NE 1/4, S12, T7S, R93W, Garfield County, Colorado
6. Reason for Application: (Check all that apply)

[x]	New or Previously Unreported Source	*Administrative Permit Amendments*	
[ ]	Modification of Existing Source	[ ]	Transfer of Ownership (Complete Section 9 & 10 below)
[ ]	Request for Synthetic Minor Permit	[ ]	Company Name Change (Complete Section 9 below)
[ ]	Other:	[ ]	Other:

7. Projected Startup Date: Anticipated 10/2010

Signature of Legally Authorized Person of Company listed in Section 1 — Date Signed: 03/17/2010

Toby Adams, Chief Operating Officer — Phone: 970 493-2780

Type or Print Name and Official Title of Person Signing Above — Fax: 970 493 7586

8. Check appropriate box if you want:
   - [ ] Copy of preliminary analysis conducted by Division
   - [x] To review a draft of the permit prior to issuance

These sections are to be completed only if a company name change or transfer of ownership has occurred.

9. Permit previously issued to:
10. Transfer of Ownership Information
    Effective Date of Permit Transfer:

As responsible party for the emission source(s) listed above, I certify that the business associated with this source has been sold, and agree to transfer the permit to said party.

Signature of Legally Authorized Person of Company listed in Section 9 — Date Signed

Phone:

Type or Print Name and Official Title of Person Signing Above — Fax:

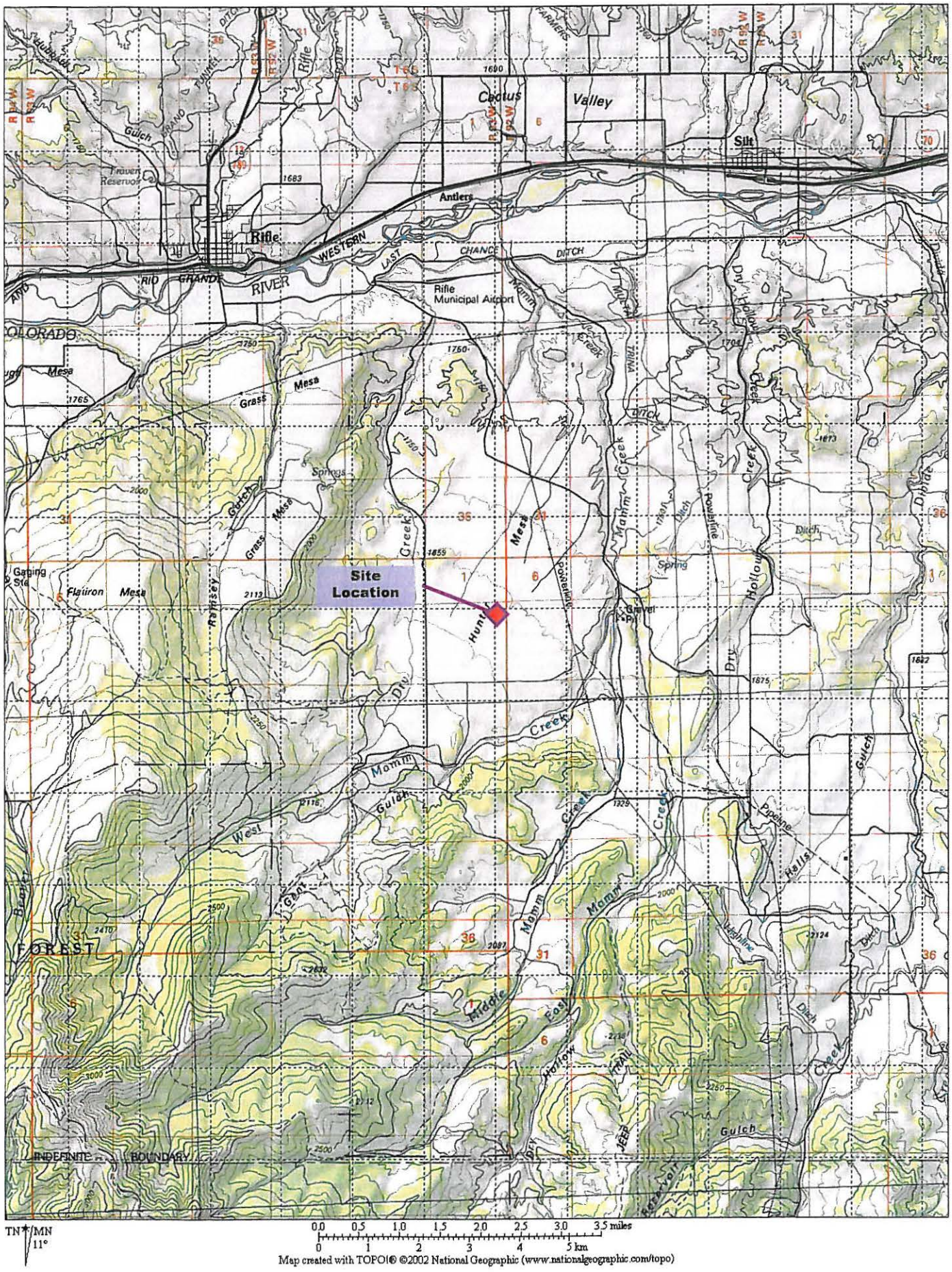
Mail completed application, APENs, and filing fee to:

Colorado Department of Public Health and Environment
Air Pollution Control Division
4300 Cherry Creek Drive South, APCD-SS-B1
Denver, Colorado 80246-1530

http://www.cdphe.state.co.us/ap/stationary.html
Phone: (303) 692-3150

Revised August 2004

FIGURE 1 - SITE LOCATION MAP



ATTACHMENT A

APEN FILING FEES

ATTACHMENT B

APCD FORMS SERIES 200

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #1 Concrete Sump** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC**

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W**

NAICS, or SIC Code:

County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base:

Mailing Address: **1900 Grant Street, Suite 630**
Denver, Colorado

ZIP Code: **80203**

Person To Contact: **Daniel Packard**

Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com**

Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

- ☒ **Request for NEW permit or newly reported emission source**
- ☐ **Request PORTABLE source permit**
- ☐ **Request MODIFICATION to existing permit (check each box below that applies)**
  - ☐ Change fuel or equipment ☐ Change company name
  - ☐ Change permit limit ☐ Transfer of ownership ☐ Other
- ☐ **Request to limit HAPs with a Federally enforceable limit on PTE**
- ☐ **Request APEN update only (check the box below that applies)**
  - ☐ Revision to actual calendar year emissions for emission inventory
  - ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **950 BBL Cast in Place Concrete Sump**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175
APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html
Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☐ Check box to request copy of draft permit prior to public notice.

FORM APCD-200

AIR POLLUTANT EMISSION NOTICE (APEN Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** ____ / ____ / ____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Sump ID#1	**6,120**	**0**							**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☒ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** **Est.**

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**5.02**	**TPY**			**5.52**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data | 3/17/2010 Date | Toby Adams Name of Legally Authorized Person (Please print) | COO Title

ON-CRITERIA REPORTABLE AIR POL ITANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A		0.0024 g/s	Water 9	155	
100-88-3	Toluene	C		0.0181 g/s	Water 9	1,168	
100-41-4	Ethyl-benzene	C		0.0022 g/s	Water 9	142	
1330-20-7	Xylene	C		0.0289 g/s	Water 9	1,865	
110-54-3	Hexane	C		-			
67-56-1	Methanol	C		0.0003 g/s	Water 9	19	
98-82-8	Cumene	A		0.0003 g/s	Water 9	19	

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Joby Adams

Signature of Person Legally Authorized to Supply Data

March 17, 2010

Date

Joby Adams

Name of Person Legally Authorized to Supply Data (Please print)

COO

Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: ID #3 DAF [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

☒ **Request for NEW permit or newly reported emission source**

☐ **Request PORTABLE source permit**

☐ **Request MODIFICATION to existing permit (check each box below that applies)**

- ☐ Change fuel or equipment ☐ Change company name
- ☐ Change permit limit ☐ Transfer of ownership ☐ Other

☐ **Request to limit HAPs with a Federally enforceable limit on PTE**

☐ **Request APEN update only (check the box below that applies)**

- ☐ Revision to actual calendar year emissions for emission inventory
- ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **Custom Built Dissolved Air Flotaton Unit by Palmer of Texas**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175

APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html

Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

FORM APCD-200

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** ____ / ____ / ____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
DAF ID#3	6,120	20	55	15	172	95			-107.715334	39.466811	Topo Map Program

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☒ Horizontal ☐ Down ☐ Other (Describe): _____

Exhaust Opening Shape & Size (**check one**): ☒ Circular: Inner Diameter (inches) = 4 ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** Est.

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC	RTO		95	99	62.62	Mg/yr		63		69	Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data	Date	Name of Legally Authorized Person (Please print)	Title
	3/17/2010	Toby Adams	COO

NON-CRITERIA REPORTABLE AIR POLLUTANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

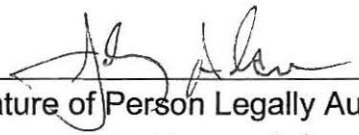
Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A	RTO/95	0.0156 g/s	Water 9	1085	54.25
100-88-3	Toluene	C	RTO/95	0.0685 g/s	Water 9	476	23.8
100-41-4	Ethyl-benzene	C	RTO/95	0.0332 g/s	Water 9	2308	115.4
1330-20-7	Xylene	C	RTO/95	0.115 g/s	Water 9	7995	7595
110-54-3	Hexane	C		0.0707 g/s	Water 9	4915	246
67-56-1	Methanol	C	RTO/95	0.001 g/s	Water 9	70	3.5
98-82-8	Cumene	A	RTO/95	0.0003 g/s	Water 9	21	1

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____



Signature of Person Legally Authorized to Supply Data

March 17, 2010

Date

Joby Adams

Name of Person Legally Authorized to Supply Data (Please print)

COO

Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #4 Air Stripper** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

☒ **Request for NEW permit or newly reported emission source**

☐ **Request PORTABLE source permit**

☐ **Request MODIFICATION to existing permit (check each box below that applies)**

- ☐ Change fuel or equipment ☐ Change company name
- ☐ Change permit limit ☐ Transfer of ownership ☐ Other

☐ **Request to limit HAPs with a Federally enforceable limit on PTE**

☐ **Request APEN update only (check the box below that applies)**

- ☐ Revision to actual calendar year emissions for emission inventory
- ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **Carbonair Stat 400 Air Stripper**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

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APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

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APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html
Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

FORM APCD-200

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** ____ / ____ / ____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
AS ID#4	**6,120**	**20**	**55**	**2,100**	**45**	**95**			**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☒ Horizontal ☐ Down ☐ Other (Describe): _____

Exhaust Opening Shape & Size (**check one**): ☒ Circular: Inner Diameter (inches) = **12** ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** **Est.**

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC	**RTO**		**95**	**99**	**115**	**tons/yr**		**115**		**127**	Stat Calcs
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data | 3/17/2010 Date | Toby Adams Name of Legally Authorized Person (Please print) | COO Title

NON-CRITERIA REPORTABLE AIR POLLUTANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A	RTO/95	5140 lbs/yr	Stat Model	5140 lbs/yr	257
100-88-3	Toluene	C	RTO/95	20,240 lbs/yr	Stat Model	20,240 lbs/yr	1012
100-41-4	Ethyl-benzene	C	RTO/95	3620 lbs/yr	Stat Model	3620 lbs/yr	181
1330-20-7	Xylene	C	RTO/95	26,780 lbs/yr	Stat Model	26,780 lbs/yr	1339
110-54-3	Hexane	C	RTO/95	1,465 lbs/yr	Stat Model	1,465 lbs/yr	73
67-56-1	Methanol	C	RTO/95	634 lbs/yr	Stat Model	634 lbs/yr	32

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Signature of Person Legally Authorized to Supply Data — March 17, 2010 (Date)

Joby Adams — Name of Person Legally Authorized to Supply Data (Please print)

COO — Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #6 Treat Tank** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

- ☒ **Request for NEW permit or newly reported emission source**
- ☐ **Request PORTABLE source permit**
- ☐ **Request MODIFICATION to existing permit (check each box below that applies)**
  - ☐ Change fuel or equipment ☐ Change company name
  - ☐ Change permit limit ☐ Transfer of ownership ☐ Other
- ☐ **Request to limit HAPs with a Federally enforceable limit on PTE**
- ☐ **Request APEN update only (check the box below that applies)**
  - ☐ Revision to actual calendar year emissions for emission inventory
  - ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **400 BBL Heated Oil Tank**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175

APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html

Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** ____ / ____ / ____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Tank ID #6	**6,120**	**24**	**ambient**	**0**	**0**	**0**			**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☒ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☐ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☒ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** **Est.**

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**1.69**	**Mg/yr**	**1.86**		**2**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.
[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data | 3/17/2010 Date | Toby Adams Name of Legally Authorized Person (Please print) | COO Title

'ON-CRITERIA REPORTABLE AIR POL 'UTANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A		0.012 g/s	Water 9	779	
100-88-3	Toluene	C		0.007 g/s	Water 9	1530	
100-41-4	Ethyl-benzene	C		0.0018 g/s	Water 9	125	
1330-20-7	Xylene	C		0.0094 g/s	Water 9	654	
110-54-3	Hexane	C			Water 9	De minimis	
67-56-1	Methanol	C			Water 9	De minimis	
98-82-8	Cumene	A		0.0002	Water 9	14	

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Signature of Person Legally Authorized to Supply Data — March 17, 2010 (Date)

Joby Adams — COO

Name of Person Legally Authorized to Supply Data (Please print) — Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) – Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #7 Sales Tank** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

☒ **Request for NEW permit or newly reported emission source**

☐ **Request PORTABLE source permit**

☐ **Request MODIFICATION to existing permit (check each box below that applies)**

- ☐ Change fuel or equipment ☐ Change company name
- ☐ Change permit limit ☐ Transfer of ownership ☐ Other

☐ **Request to limit HAPs with a Federally enforceable limit on PTE**

☐ **Request APEN update only (check the box below that applies)**

- ☐ Revision to actual calendar year emissions for emission inventory
- ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **400 BBL Oil Tank - Sales**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____ For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175

APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html

Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) and Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** _____ / _____ / _____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Tank ID #7	**6,120**	**24**	**ambient**	**0**	**0**	**0**			**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☒ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☒ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☒ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☒ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** **Est.**

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**1.65**	**Mg/yr**	**1.82**		**2**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data | 3/17/2010 Date | Toby Adams Name of Legally Authorized Person (Please print) | COO Title

ON-CRITERIA REPORTABLE AIR POL ITANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A		0.012 g/s	Water 9	765	
100-88-3	Toluene	C		0.007 g/s	Water 9	1502	
100-41-4	Ethyl-benzene	C		0.0018 g/s	Water 9	118	
1330-20-7	Xylene	C		0.0094 g/s	Water 9	639	
110-54-3	Hexane	C			Water 9	De minimis	
67-56-1	Methanol	C			Water 9	De minimis	
98-82-8	Cumene	A		0.0002	Water 9	14	

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Signature of Person Legally Authorized to Supply Data — March 17, 2010 (Date)

Joby Adams — COO

Name of Person Legally Authorized to Supply Data (Please print) — Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) & Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** _____ / _____ / _____

Facility Equipment ID: **ID #8.1 Pond** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

☒ **Request for NEW permit or newly reported emission source**

☐ **Request PORTABLE source permit**

☐ **Request MODIFICATION to existing permit (check each box below that applies)**

- ☐ Change fuel or equipment
- ☐ Change company name
- ☐ Change permit limit
- ☐ Transfer of ownership
- ☐ Other

☐ **Request to limit HAPs with a Federally enforceable limit on PTE**

☐ **Request APEN update only (check the box below that applies)**

- ☐ Revision to actual calendar year emissions for emission inventory
- ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **35,000 BBL Storage Pond**

Section 03 – General Information

For existing sources, operation began on: _____ / _____ / _____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

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Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175
APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html
Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** _____ / _____ / _____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Sum ID#1	**6,120**	**0**							**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☒ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☐ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** _____

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**34.03**	**Mg/yr**	**37.51**		**41.26**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data	Date	Name of Legally Authorized Person (Please print)	Title
	3/17/2010	Toby Adams	COO

ON-CRITERIA REPORTABLE AIR POL. TANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A	RTO/95				
100-88-3	Toluene	C	RTO/95				
100-41-4	Ethyl-benzene	C	RTO/95				
1330-20-7	Xylene	C	RTO/95				
110-54-3	Hexane	C	RTO/95				
67-56-1	Methanol	C	RTO/95	1.0713 g/s	Water 9	74,482	
98-82-8	Cumene	A	RTO/95				

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Joby Adams March 17, 2010

Signature of Person Legally Authorized to Supply Data Date

Joby Adams COO

Name of Person Legally Authorized to Supply Data (Please print) Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #8.2 Pond** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC** NAICS, or SIC Code: _____

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W** County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630** ZIP Code: **80203**

Denver, Colorado

Person To Contact: **Daniel Packard** Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com** Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

- ☒ **Request for NEW permit or newly reported emission source**
- ☐ **Request PORTABLE source permit**
- ☐ **Request MODIFICATION to existing permit (check each box below that applies)**
  - ☐ Change fuel or equipment ☐ Change company name
  - ☐ Change permit limit ☐ Transfer of ownership ☐ Other
- ☐ **Request to limit HAPs with a Federally enforceable limit on PTE**
- ☐ **Request APEN update only (check the box below that applies)**
  - ☐ Revision to actual calendar year emissions for emission inventory
  - ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **35,000 BBL Storage Pond**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
Small Business Assistance Program (SBAP): (303) 692-3148 or (303) 692-3175
APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html
Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** _____ / _____ / _____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Sum ID#1	**6,120**	**0**							**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☒ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☐ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** _____

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**11.91**	**Mg/yr**	**13.1**		**14.41**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Toby Adams 3/17/2010 COO

Signature of Person Legally Authorized to Supply Data | Date | Name of Legally Authorized Person (Please print) | Title

ON-CRITERIA REPORTABLE AIR POLLUTANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A	RTO/95				
100-88-3	Toluene	C	RTO/95				
100-41-4	Ethyl-benzene	C	RTO/95				
1330-20-7	Xylene	C	RTO/95				
110-54-3	Hexane	C	RTO/95				
67-56-1	Methanol	C	RTO/95	0.3777 g/s	Water 9	26,260	
98-82-8	Cumene	A	RTO/95				

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Signature of Person Legally Authorized to Supply Data — March 17, 2010 (Date)

Joby Adams — COO

Name of Person Legally Authorized to Supply Data (Please print) — Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ [Leave blank unless APCD has already assigned a permit # & AIRS ID] **Emission Source AIRS ID:** ____ / ____ / ____

Facility Equipment ID: **ID #8.3 Pond** [Provide Facility Equipment ID to identify how this equipment is referenced within your organization.]

Section 01 – Administrative Information

Company Name: **GreenBack Produced Water Recovery, LLC**

Source Name: **Shaffer Ranch Facility**

Source Location: **NE1/4, NE1/4, S12, T7S, R93W**

NAICS, or SIC Code: _____

County: **Garfield**

Elevation: **6,120** Feet

Portable Source Home Base: _____

Mailing Address: **1900 Grant Street, Suite 630**
Denver, Colorado

ZIP Code: **80203**

Person To Contact: **Daniel Packard**

Phone Number: **303-887-8387**

E-mail Address: **DanPackard@aol.com**

Fax Number: **303-318-9659**

Section 02 – Requested Action (check applicable request boxes)

- ☒ **Request for NEW permit or newly reported emission source**
- ☐ **Request PORTABLE source permit**
- ☐ **Request MODIFICATION to existing permit (check each box below that applies)**
  - ☐ Change fuel or equipment
  - ☐ Change company name
  - ☐ Change permit limit
  - ☐ Transfer of ownership
  - ☐ Other
- ☐ **Request to limit HAPs with a Federally enforceable limit on PTE**
- ☐ **Request APEN update only (check the box below that applies)**
  - ☐ Revision to actual calendar year emissions for emission inventory
  - ☐ Update 5-Year APEN term without change to permit limits or previously reported emissions

Additional Info. & Notes: **35,000 BBL Storage Pond**

Section 03 – General Information

For existing sources, operation began on: ____ / ____ / ____

For new or reconstructed sources, the projected startup date is: **11** / **1** / **2010**

Normal Hours of Source Operation: **24** hours/day **7** days/week **52** weeks/year

General description of equipment and purpose: **Commercial produced water treatment, storage and recycling facility.**

Will this equipment be operated in any NAAQS nonattainment area? (http://www.cdphe.state.co.us/ap/attainmaintain.html) ☐ Yes ☒ No ☐ Don't know

Section 04 – Processing/Manufacturing Equipment Information & Material Use

Description of equipment[1]:

Manufacturer: _____ Model No.: _____ Serial No.: _____

	Description	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Design Process Rate (Specify Units/Hour)
Raw Materials:				
Finished Products:				
Other Process:				

[1]If additional space is required, please attach a separate list of equipment, materials and throughputs.

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Colorado Department of Public Health and Environment
Air Pollution Control Division (APCD)

This notice is valid for five (5) years. Submit a revised APEN prior to expiration of five-year term, or when a significant change is made (increase production, new equipment, change in fuel type, etc).

Mail this form along with a check for $152.90 to:
Colorado Department of Public Health & Environment
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

For guidance on how to complete this APEN form:

Air Pollution Control Division: (303) 692-3150
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APEN forms: http://www.cdphe.state.co.us/ap/downloadforms.html
Application status: http://www.cdphe.state.co.us/ap/ss/sspcpt.html

☐ Check box to request copy of draft permit prior to issuance.

☒ Check box to request copy of draft permit prior to public notice.

FORM APCD-200

AIR POLLUTANT EMISSION NOTICE (APEN) Application for Construction Permit – General

Permit Number: _____ **Emission Source AIRS ID:** ____ / ____ / ____

Section 05 – Emission Release Information (Attach a separate sheet with relevant information in the event of multiple releases; provide datum & **either** Lat/Long **or** UTM)

Operator Stack ID No.	Base Elevation (feet)	Discharge Height Above Ground Level (Feet)	Temp. (°F)	Flow Rate (ACFM)	Velocity (ft/sec)	Moisture (%)	Horizontal Datum (NAD27, NAD83, WGS84)	UTM Zone (12 or 13)	UTM Easting or Longitude (meters or degrees)	UTM Northing or Latitude (meters or degrees)	Method of Collection for Location Data (e.g. map, GPS, GoogleEarth)
Sum ID#1	**6,120**	**0**							**-107.715334**	**39.466811**	**Topo Map Program**

Direction of outlet (**check one**): ☐ Vertical ☐ Vertical with obstructing raincap ☐ Horizontal ☐ Down ☒ Other (Describe): **Fugitive**

Exhaust Opening Shape & Size (**check one**): ☐ Circular: Inner Diameter (inches) = _____ ☐ Other: Length (inches) = _____ Width (inches) = _____

Section 06 – Combustion Equipment & Fuel Consumption Information

Company equipment Identification No.: _____ Manufacturer: _____ Model: _____ Serial No.: _____

Fuel Type	Design Input Rate (10^6 Btu/hr)	Actual Level (For Data Year)	Annual Requested Permitted Level[2] (Specify Units)	Fuel Heating Value (Indicate: Btu/lb, Btu/gal, Btu/SCF)	Percent by Weight		Seasonal Fuel Use (% of Annual Use)			
					Sulfur	Ash	Dec-Feb	Mar-May	Jun-Aug	Sep-Nov

[2]Requested values will become permit limitations. Requested level should consider process growth over the next five years.

Section 07 – Emissions Inventory Information & Emission Control Information

Attach any emission calculations and emission factor documentation to this APEN form.

☐ **Emission Factor Documentation attached** **Data year for actual calendar yr. emissions below & throughput above (e.g. 2007):** _____

Pollutant	Control Device Description		Overall Collection Efficiency	Control Efficiency (% Reduction)	Emission Factor		Actual Calendar Year Emissions[3]		Requested Permitted Emissions[4]		Estimation Method or Emission Factor Source
	Primary	Secondary			Uncontrolled Basis	Units	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	Uncontrolled (Tons/Year)	Controlled (Tons/Year)	
TSP											
PM_{10}											
$PM_{2.5}$											
SO_X											
NO_X											
VOC					**3.64**	**Mg/yr**	**4.0**		**5.0**		Water 9
CO											
Please use the APCD Non-Criteria Reportable Air Pollutant Addendum form to report pollutants not listed above.											

[3] Annual emission fees will be based on actual emissions reported here. If left blank, annual emission fees will be based on requested emissions.

[4] If Requested Permitted Emissions is left blank, the APCD will calculate emissions based on the information supplied in sections 03 - 07.

Section 08 –Applicant Certification - I hereby certify that all information contained herein and information submitted with this application is complete, true and correct.

Signature of Person Legally Authorized to Supply Data | 3/17/2010 Date | Toby Adams Name of Legally Authorized Person (Please print) | COO Title

NON-CRITERIA REPORTABLE AIR POLLUTANT EMISSION NOTICE ADDENDUM

(See reverse side for guidance on completing this form)

Permit Number: _____ **AIRS ID Number:** _____

Company Name: GreenBack Produced Water Recovery, LLC

Plant Location: NE1/4, NE1/4, S12, T7S, R63W County: Garfield Zip Code: _____

Person to Contact: Joby Adams Phone Number: 970-493-7780

E-mail Address: Joby@cgrs.com Fax Number: 970-493-7986

Chemical Abstract Service (CAS) Number	Chemical Name	Reporting BIN	Control Equipment / Reduction (%)	Emission Factor (Include Units)	Emission Factor Source	Uncontrolled Actual Emissions (lbs/year)	Controlled Actual Emissions (lbs/year)
71-43-2	Benzene	A	RTO/95				
100-88-3	Toluene	C	RTO/95				
100-41-4	Ethyl-benzene	C	RTO/95				
1330-20-7	Xylene	C	RTO/95				
110-54-3	Hexane	C	RTO/95				
67-56-1	Methanol	C	RTO/95	0.1155 g/s	Water 9	8,030	
98-82-8	Cumene	A	RTO/95				

Reporting Scenario (1, 2 or 3): 1 Calendar Year for which Actual Data Applies: _____

Signature of Person Legally Authorized to Supply Data

March 17, 2010
Date

Joby Adams
Name of Person Legally Authorized to Supply Data (Please print)

COO
Title of Person Legally Authorized to Supply Data

Form Revision Date: December 4, 2006

ATTACHMENT C

EMISSION CALCULATIONS AND SUPPORTING DOCUMENTS

GreenBack Produced Water Recovery, LLC (GreenBack)
Air Emission Estimation Methods and RACT Analysis
Shaeffer Ranch Facility

The proposed GreenBack facility is designed to treat, store and recycle produced water generated during oil and gas collection activities. This commercial facility will accept waste streams from a variety of operators in the Piceance Basin. There are a number of treatment processes that will generate volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions. These processes will include:

- off-loading water storage;
- hydrocylone solids separation and storage;
- oil water separation;
- oil storage;
- water clarification by dissolved air flotation;
- recycled oil loading;
- dissolved hydrocarbon removal by air stripping; and
- pond water storage.

Emission points are depicted on Figures 2 and 3 of Attachment G. To evaluate potential air emissions the composition of the waste stream must be known. One condensate sample and six water samples were obtained from various oil and natural gas operations in the Piceance Basin. The samples were analyzed for VOCs and methanol as well as other parameters. To simulate the oil water separation process free oil was removed from the six water samples by a process referred to as a 'grind out'. The six samples were also composited prior to the grind out and a VOC scan performed as well. Oil removal was accomplished by sonicating the samples to coalesce free oil and then centrifuging the samples to simulate gravity separation. These samples are identified as EN-1 through EN-6 in Section A. The composite sample is identified as "Composite". The condensate sample is identified as "Sample 2" (Pace Analytical).

Air emissions were estimated by the use of analytical models Water 9, EPA Tanks, Carbonair Stat Air Stripping Model and by mass balance techniques. The total flow for the treatment system was set at 5000 barrels (bbls) per day or 145.83 gpm. A 5% waste stream loss was estimated for hydrocyclone separation and a 4% loss for oil water separation. Emission estimates were made by grouping the emission units into five model units as described below.

1. Pre-treatment using Water 9 – The concrete sump (950 bbl), solids removal by hydrocyclone, oil water separation and oil storage were modeled using Water 9. Water 9 has the ability to deduct the hydrocarbon mass lost at each unit in the treatment model train. The chemical and physical properties of the waste stream were input into the model, which were then used though out the treatment process, which is depicted in the analysis documentation. As most of these treatment processes include the presence of free oil, analytical data generated from the condensate analysis was used to estimate emission factors and total VOC losses. The model was assigned the most appropriate treatment or storage unit as described below.

    a. Concrete Sump (ID #1) – modeled as "Open Sump". The concrete sump will be covered but will have sections that are open to air. The program allows the modeler to input dimensions and the area exposed to a constant velocity wind, which is likely a very conservative estimate.
    b. Hydrocyclone to filter box (ID #2) – modeled as "Porous Solids Unit". The porous solids unit was chosen as it best represented the waste stream generated from the de-silting process, which has a very high solids content. The diffusion of VOCs into open pore spaces is the primary emission mechanism.
    c. Gun Barrel (ID# 5) – modeled as "Storage Tank – Constant Level". The Gun Barrel will maintain a constant water and oil level, which greatly reduces emission tank emissions. The through put through the tank was set at 4% to total flow (0.36 l/s)

as this is the anticipated maximum oil cut from the separation process.

d. Storage Tanks (ID 6 and 7) - modeled as "Storage Tanks". Emission estimates were made by using both Water 9 and EPA Tanks, which yielded very similar results. The Tanks program allowed the input of Gasoline (RVP 7) where Water 9 did not. Compounds measured in the condensate analysis were input into both models as allowed by each models data set. The emission estimate difference for the oil storage tanks was approximately 6%, with the higher emission estimates from Water 9, which were used in the permit submittals. The computer emission data sheets are provided in the analysis attachment.

2. DAF Water 9 Analysis (ID #3) – A rectangular DAF unit was available in the program and was used to model emissions. The total area and volume were set equal to the proposed DAF. As water entering the DAF will have gone through two oil water separation units the "Grind Out" analytical data was used for the influent waste characteristics. The averages of the BTEX, hexane, DRO and GRO values (EN-1 through EN-6) were used to estimate VOC emissions. Analytical data sheets are provided in Section B of this Attachment.

3. Air Stripper (ID #4) – the DAF effluent concentrations were used as dissolved hydrocarbon concentrations in the influent to the air stripper. VOC concentrations were input into an excel spread sheet which, calculated total VOC removal by the air stripper. These values were then used in the permit submittal. Removal efficiencies estimated from the Stat Model calculations (provided in Section C of this Attachment) were used to estimate influent concentrations to the storage Ponds, which were modeled in Water 9. An excel spreadsheet generated by the author provides potential emissions for VOC compounds from the air stripper.

4. Pond Emissions (ID 8.1-8.3) – The "Lagoon function" in Water 9 was used to estimate VOC emissions from the three storage ponds. The model, as mentioned previously, deducts the mass losses from the previous unit to estimate VOC emissions from the next unit in the model train. The primary VOC of concern for these emission estimates is methanol. Section D of this Attachment presents model data.

5. Oil Sales Loading (ID # 9) – Emissions for this process was modeled using EPA tanks. The input values are provided in the Tanks Analysis attachment. An aluminum, 8,000 gallon capacity, horizontal tank was modeled. The throughput was set at approximately 73,000 bbls, which represents the 4% oil cut mentioned previously. Model results are presented in Section E of this Attachment.

RACT Analysis – Pond Methanol Recovery

Our permit submittal does not address the capture and treatment of methanol. Methanol is an extremely soluble polar compound. At ambient temperatures it cannot be effectively removed by air stripping, carbon absorption or by reverse osmosis. It can be removed by evaporation via steam stripping, mechanical vapor recompression or by oxidation. All options are extremely expensive with treatment costs of between $12,000 and $50,000 per ton. The presence of dissolved petroleum will be removed by the treatment process and is not addressed by this analysis.

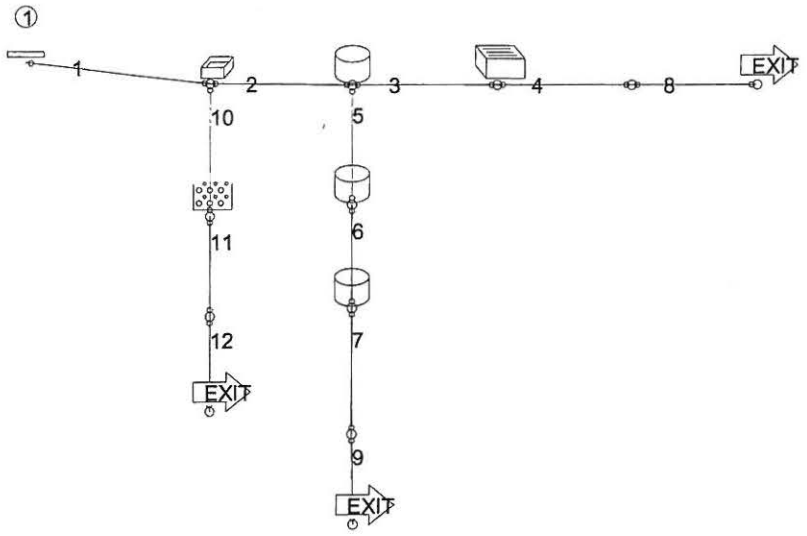
Approximately 569 calories are required to evaporate one gram of water. The assumed average flow is 145.83 gallons per minute. The energy required to vaporize 145.83 gallons of water is 365.04 kilowatt hours (KWH). Assuming an average methanol concentration of 425 mg/L, the total mass of methanol in 145.83 gallons of water is 0.52 lbs or 2.6×10^{-4} tons. A reasonable electrical cost is $0.09 per KWH. This yields a cost of in excess of $126,000 just to capture one ton of methanol. This does not include the capital cost of equipment, labor and maintenance. Using natural gas as the energy source the calculated evaporation cost is in excess of $46,000 per ton of methanol. It

is obvious that with current technologies the capture and treatment of methanol in a high volume waste stream is not economically viable.

SECTION A

WATER 9 ANALYSIS – CONCRETE SUMP, FILTER BOX, GUN BARREL, OIL TREATING TANK AND OIL SALES TANK

GreenBack Pre-treatment 12:59:21 03-18-2010



No.	Name	Type	flow (l/s)
1	Off-loading Pipe	hard piped, no headspace	
2	Concrete Sump #1	open sump	8.74
3	Gun Barrel ID# 5	storage tank	8.39
4	DAF Unit #3	DAF or grit separator	8.39
5	Gun Barrel	oil removal stream	.35
6	Oil Treating Tank	storage tank	.35
7	Oil SalesTank #7	storage tank	.35
8	def.system exit st	system exit stream	8.39
9	def.system exit st	system exit stream	.35
10	def.solids removal	solids removal stream	
11	Filter Box ID#2	porous solids unit	.46
12	def.system exit st	system exit stream	.46

Raw Water Quality - Pre-treatment

UNIT CONCENTRATION SUMMARY 03-17-2010 15:41:50
GreenBack Pre-treatment
Project H:\Documents\PreTreatment 3/17/2010 8:49:24 AM
The selected unit is 1 Off-loading Pipe

COMPOUND NAME	Cin (PPMW)	Air fe	Removal fbio	Cout (ppmw)
BENZENE	3980.	.	.	3980.
CUMENE (isopropylbenzene)	773.	.	.	773.
ETHYLBENZENE	4610.	.	.	4610.
OIL (decane as surrogate)	2.e+05	.	.	2.e+05
TOLUENE	3.46e+04	.	.	3.46e+04
XYLENE	5.28e+04	.	.	5.28e+04
METHANOL	412.275	.	.	412.275
BUTYL BENZENE	467.	.	.	467.
PROPYL(-n) BENZENE	1120.	.	.	1120.
TRIMETHYLBENZENE (1,3,5)	7850.	.	.	7850.
CYMENE,para	317.	.	.	317.
sec BUTYLBENZENE	211.	.	.	211.
1,2,4-TRIMETHYLBENZENE	7590.	.	.	7590.
HEXANE(-n)	8.47	.	.	8.47

TOTAL ALL COMPOUNDS 0.00E+00 g/s air emissions

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: SAMPLE 2
Pace Project No.: 6070736

Sample: SAMPLE 2 **Lab ID: 6070736001** Collected: 12/07/09 19:45 Received: 12/09/09 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Acetone	ND	ug/L	1000000	100000		12/20/09 14:35	67-64-1	
Benzene	**3980000**	ug/L	100000	100000		12/20/09 14:35	71-43-2	
Bromobenzene	ND	ug/L	100000	100000		12/20/09 14:35	108-86-1	
Bromochloromethane	ND	ug/L	100000	100000		12/20/09 14:35	74-97-5	
Bromodichloromethane	ND	ug/L	100000	100000		12/20/09 14:35	75-27-4	
Bromoform	ND	ug/L	100000	100000		12/20/09 14:35	75-25-2	
Bromomethane	ND	ug/L	100000	100000		12/20/09 14:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	1000000	100000		12/20/09 14:35	78-93-3	
n-Butylbenzene	**467000**	ug/L	100000	100000		12/20/09 14:35	104-51-8	
sec-Butylbenzene	**211000**	ug/L	100000	100000		12/20/09 14:35	135-98-8	
tert-Butylbenzene	ND	ug/L	100000	100000		12/20/09 14:35	98-06-6	
Carbon disulfide	ND	ug/L	500000	100000		12/20/09 14:35	75-15-0	
Carbon tetrachloride	ND	ug/L	100000	100000		12/20/09 14:35	56-23-5	
Chlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	108-90-7	
Chloroethane	ND	ug/L	100000	100000		12/20/09 14:35	75-00-3	
Chloroform	ND	ug/L	100000	100000		12/20/09 14:35	67-66-3	
Chloromethane	ND	ug/L	100000	100000		12/20/09 14:35	74-87-3	
-Chlorotoluene	ND	ug/L	100000	100000		12/20/09 14:35	95-49-8	
Chlorotoluene	ND	ug/L	100000	100000		12/20/09 14:35	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	250000	100000		12/20/09 14:35	96-12-8	
Dibromochloromethane	ND	ug/L	100000	100000		12/20/09 14:35	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	100000	100000		12/20/09 14:35	106-93-4	
Dibromomethane	ND	ug/L	100000	100000		12/20/09 14:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	106-46-7	
Dichlorodifluoromethane	ND	ug/L	100000	100000		12/20/09 14:35	75-71-8	
1,1-Dichloroethane	ND	ug/L	100000	100000		12/20/09 14:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	100000	100000		12/20/09 14:35	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	100000	100000		12/20/09 14:35	540-59-0	
1,1-Dichloroethene	ND	ug/L	100000	100000		12/20/09 14:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	100000	100000		12/20/09 14:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100000	100000		12/20/09 14:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	100000	100000		12/20/09 14:35	78-87-5	
1,3-Dichloropropane	ND	ug/L	100000	100000		12/20/09 14:35	142-28-9	
2,2-Dichloropropane	ND	ug/L	100000	100000		12/20/09 14:35	594-20-7	
1,1-Dichloropropene	ND	ug/L	100000	100000		12/20/09 14:35	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	100000	100000		12/20/09 14:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	100000	100000		12/20/09 14:35	10061-02-6	
Ethylbenzene	**4610000**	ug/L	100000	100000		12/20/09 14:35	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	100000	100000		12/20/09 14:35	87-68-3	
2-Hexanone	ND	ug/L	1000000	100000		12/20/09 14:35	591-78-6	
Isopropylbenzene (Cumene)	**773000**	ug/L	100000	100000		12/20/09 14:35	98-82-8	
p-Isopropyltoluene	**317000**	ug/L	100000	100000		12/20/09 14:35	99-87-6	
Methylene chloride	ND	ug/L	100000	100000		12/20/09 14:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	1000000	100000		12/20/09 14:35	108-10-1	
thyl-tert-butyl ether	ND	ug/L	100000	100000		12/20/09 14:35	1634-04-4	

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ANALYTICAL RESULTS

Project: SAMPLE 2
Pace Project No.: 6070736

Sample: SAMPLE 2 **Lab ID: 6070736001** Collected: 12/07/09 19:45 Received: 12/09/09 09:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260							
Naphthalene	ND	ug/L	1000000	100000		12/20/09 14:35	91-20-3	
n-Propylbenzene	**1120000**	ug/L	100000	100000		12/20/09 14:35	103-65-1	
Styrene	ND	ug/L	100000	100000		12/20/09 14:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	100000	100000		12/20/09 14:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	100000	100000		12/20/09 14:35	79-34-5	
Tetrachloroethene	ND	ug/L	100000	100000		12/20/09 14:35	127-18-4	
Toluene	**34600000**	ug/L	100000	100000		12/20/09 14:35	108-88-3	E
1,2,3-Trichlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	100000	100000		12/20/09 14:35	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	100000	100000		12/20/09 14:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	100000	100000		12/20/09 14:35	79-00-5	
Trichloroethene	ND	ug/L	100000	100000		12/20/09 14:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	100000	100000		12/20/09 14:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	250000	100000		12/20/09 14:35	96-18-4	
1,2,4-Trimethylbenzene	**7590000**	ug/L	100000	100000		12/20/09 14:35	95-63-6	
1,3,5-Trimethylbenzene	**7850000**	ug/L	100000	100000		12/20/09 14:35	108-67-8	
Vinyl chloride	ND	ug/L	100000	100000		12/20/09 14:35	75-01-4	
Xylene (Total)	**52800000**	ug/L	300000	100000		12/20/09 14:35	1330-20-7	E
Bromofluorobenzene (S)	108	%	87-115	100000		12/20/09 14:35	460-00-4	
Dibromofluoromethane (S)	90	%	87-113	100000		12/20/09 14:35	1868-53-7	
1,2-Dichloroethane-d4 (S)	83	%	81-121	100000		12/20/09 14:35	17060-07-0	
Toluene-d8 (S)	117	%	89-111	100000		12/20/09 14:35	2037-26-5	P2,S2
Preservation pH	**1.0**		0.10	100000		12/20/09 14:35		
8260 MSV GRO and Oxygenates	Analytical Method: EPA 8260							
TPH-GRO	**590000000**	ug/L ✓	50000000	100000		12/20/09 14:35		
HEM, Oil and Grease	Analytical Method: EPA 1664A							
Oil and Grease	**115000**	mg/L	5.0	1		12/14/09 15:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**3300**	mg/L	5.0	1		12/10/09 21:48		
2540D Total Suspended Solids	Analytical Method: SM 2540D							
Total Suspended Solids	**140**	mg/L	5.0	1		12/10/09 22:01		
5540C MBAS Surfactants	Analytical Method: SM 5540C							
Surfactants	ND	mg/L	0.80	1		12/09/09 20:00		D3,H1
8015M Alcohols	Analytical Method: EPA 8015 Modified							
Methanol	ND	mg/L	500	100		12/15/09 11:08	67-56-1	

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ANALYTICAL RESULTS

Project: SAMPLE 2
Pace Project No.: 6070736

Sample: SAMPLE 2 **Lab ID: 6070736003** Collected: 12/07/09 19:45 Received: 12/09/09 09:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015B Diesel Range Organics	Analytical Method: EPA 8015B Preparation Method: EPA 3546							
TPH-DRO	**202000**	mg/kg	5940	20	12/10/09 00:00	12/16/09 10:36		
n-Tetracosane (S)	0	%	41-130	20	12/10/09 00:00	12/16/09 10:36	646-31-1	1e,D4
p-Terphenyl (S)	0	%	39-130	20	12/10/09 00:00	12/16/09 10:36	92-94-4	1e
8270 MSSV Semivolatiles	Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Acenaphthene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	83-32-9	
Acenaphthylene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	208-96-8	
Anthracene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	120-12-7	
Benzo(a)anthracene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	56-55-3	
Benzo(a)pyrene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	50-32-8	
Benzo(b)fluoranthene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	207-08-9	
Benzoic acid	ND	ug/kg	5010000	10	12/15/09 00:00	12/16/09 20:51	65-85-0	
Benzyl alcohol	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	100-51-6	
4-Bromophenylphenyl ether	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	101-55-3	
tylbenzylphthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	85-68-7	
Chloro-3-methylphenol	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	59-50-7	
4-Chloroaniline	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	39638-32-9	
2-Chloronaphthalene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	91-58-7	
2-Chlorophenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	7005-72-3	
Chrysene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	53-70-3	
Dibenzofuran	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	132-64-9	
1,2-Dichlorobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	91-94-1	
2,4-Dichlorophenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	120-83-2	
Diethylphthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	84-66-2	
2,4-Dimethylphenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	105-67-9	
Dimethylphthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	131-11-3	
Di-n-butylphthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/kg	5010000	10	12/15/09 00:00	12/16/09 20:51	534-52-1	
2,4-Dinitrophenol	ND	ug/kg	5010000	10	12/15/09 00:00	12/16/09 20:51	51-28-5	
2,4-Dinitrotoluene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	121-14-2	
2,6-Dinitrotoluene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	606-20-2	
Di-n-octylphthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	117-81-7	
Fluoranthene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	206-44-0	
Fluorene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	87-68-3	

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ANALYTICAL RESULTS

Project: SAMPLE 2
Pace Project No.: 6070736

Sample: SAMPLE 2 **Lab ID: 6070736003** Collected: 12/07/09 19:45 Received: 12/09/09 09:15 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Semivolatiles	Analytical Method: EPA 8270 Preparation Method: EPA 3546							
Hexachlorobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	118-74-1	
Hexachlorocyclopentadiene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	77-47-4	
Hexachloroethane	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	193-39-5	
Isophorone	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	78-59-1	
2-Methylnaphthalene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51		
Naphthalene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	91-20-3	
2-Nitroaniline	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	88-74-4	
3-Nitroaniline	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	99-09-2	
4-Nitroaniline	ND	ug/kg	1980000	10	12/15/09 00:00	12/16/09 20:51	100-01-6	
Nitrobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	98-95-3	
2-Nitrophenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	88-75-5	
4-Nitrophenol	ND	ug/kg	5010000	10	12/15/09 00:00	12/16/09 20:51	100-02-7	
N-Nitroso-di-n-propylamine	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	621-64-7	
Nitrosodiphenylamine	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	86-30-6	
ntachlorophenol	ND	ug/kg	5010000	10	12/15/09 00:00	12/16/09 20:51	87-86-5	
Phenanthrene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	85-01-8	
Phenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	108-95-2	
Pyrene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	120-82-1	
2,4,5-Trichlorophenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	95-95-4	
2,4,6-Trichlorophenol	ND	ug/kg	990000	10	12/15/09 00:00	12/16/09 20:51	88-06-2	
Nitrobenzene-d5 (S)	0	%	20-107	10	12/15/09 00:00	12/16/09 20:51	4165-60-0	D3,P3, S4
2-Fluorobiphenyl (S)	0	%	36-105	10	12/15/09 00:00	12/16/09 20:51	321-60-8	S4
Terphenyl-d14 (S)	0	%	46-130	10	12/15/09 00:00	12/16/09 20:51	1718-51-0	S4
Phenol-d6 (S)	0	%	38-102	10	12/15/09 00:00	12/16/09 20:51	13127-88-3	S4
2-Fluorophenol (S)	0	%	33-105	10	12/15/09 00:00	12/16/09 20:51	367-12-4	S4
2,4,6-Tribromophenol (S)	0	%	38-102	10	12/15/09 00:00	12/16/09 20:51	118-79-6	S4

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-17-2010

GreenBack Pre-treatment 1,2,4-TRIMETHYLBENZENE 2 Concrete Sump #1

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	36.616	.00007	.	.0024
2	CUMENE (isopropylbenzene)	7.1116	.00005	.	.0003
3	ETHYLBENZENE	42.412	.00005	.	.0022
4	OIL (decane as surrogate)	1840.	.00005	.	.0843
5	TOLUENE	318.32	.00006	.	.0181
6	XYLENE	485.76	.00006	.	.0289
7	METHANOL	3.7929	.00007	.	.0003
8	BUTYL BENZENE	4.2964	.00004	.	.0002
9	PROPYL(-n) BENZENE	10.304	.00005	.	.0006
10	TRIMETHYLBENZENE (1,3,5)	72.22	.00005	.	.0035
11	CYMENE,para	2.9164	.00004	.	.0001
12	sec BUTYLBENZENE	1.9412	.00006	.	.0001
13	1,2,4-TRIMETHYLBENZENE	69.828	.00005	.	.0034
	TOTALS	2895.519			.1444

The total air emissions are 4.55 Mg/yr

open sump (no. 2)

Description of unit	Concrete Smp 1
Underflow T (C)	25
Total water added at the unit (l/s)	
Area of openings at unit (cm2)	50
Radius of drop pipe (cm)	5
Drop length to conduit (cm)	61
Open surface=1	1
Subsurface entrance=1	1
subsurface exit =1	1
radius of underflow conduit (cm)	3.81
distance to next unit (cm)	500
slope of underflow conduit	0.015
Open surface of liquid at the unit (cm2)	10000
flow entrance depth under surface (cm)	180
depth of liquid in sump (cm)	200
velocity air at opening (ft/min)	88
municipal waste in conduit =1	
Assume equilibrium in unit, =1	
pH	

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-16-2010
GreenBack Pre-treatment 1,2,4-TRIMETHYLBENZENE 11 Filter Box ID#2

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	2.9794	.00006	.00433	.0002
2	CUMENE (isopropylbenzene)	.4529	.00001	.00337	.
3	ETHYLBENZENE	2.8633	.00002	.0035	.0001
4	OIL (decane as surrogate)	102.8721	.00001	.00328	.0007
5	TOLUENE	23.4554	.00003	.00381	.0008
6	XYLENE	32.7968	.	.00319	.0001
7	METHANOL	.1875	.00001	.00335	.
8	BUTYL BENZENE	.2456	.	.00316	.
9	PROPYL(-n) BENZENE	.638	.	.00317	.
10	TRIMETHYLBENZENE (1,3,5)	4.2966	.00001	.0033	.
11	CYMENE,para	.1704	.00001	.00328	.
12	sec BUTYLBENZENE	.0979	.	.00318	.
13	1,2,4-TRIMETHYLBENZENE	4.3609	.	.00317	.
	TOTALS	175.4169			.0019

The total air emissions are .06 Mg/yr

0.07 tons/yr

porous solids unit (no. 11)

Description of unit	Filter BoxID#
temperature in porous solids (C)	25
depth of waste layer (cm)	121
total porosity	0.4
air porosity	0.01
mwt oil	180
time of calculations (days)	365
active biomass (g/cc)	
loading g/cc soil	0.036
Wind speed (cm/s at 10 m)	20
area of landtreatment (m2)	10.41
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
pH	7

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-16-2010
GreenBack Pre-treatment 1,2,4-TRIMETHYLBENZENE 3 Gun Barrel ID# 5

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	33.5214	.	.	.0001
2	CUMENE (isopropylbenzene)	6.656	.	.	.
3	ETHYLBENZENE	39.5277	.	.	.
4	OIL (decane as surrogate)	1710.72	.	.	.0001
5	TOLUENE	294.5057	.	.	.0001
6	XYLENE	452.7491	.	.	.0001
7	METHANOL	3.6053	.	.	.
8	BUTYL BENZENE	4.0506	.	.	.
9	PROPYL(-n) BENZENE	9.664	.	.	.
10	TRIMETHYLBENZENE (1,3,5)	67.9195	.	.	.
11	CYMENE,para	2.7458	.	.	.
12	sec BUTYLBENZENE	1.8238	.	.	.
13	1,2,4-TRIMETHYLBENZENE	65.4581	.	.	.
	TOTALS	2692.947			.0004

The total air emissions are .01 Mg/yr

0.01 tons/yr

storage tank (no. 3)

Description of unit	Gun BarrelID#5
Wastewater temperature (C)	25
Open surface area of tank (m2)	
Density of liquid in tank (g/cc)	0.98
tank waste Mwt, water=18	180
unit storage time (days)	
tank paint factor	0.6
tank diameter (m)	3.81
tank vapor space height (m)	0.91
diurnal temp. change (deg.C)	11
tank height (m)	
oil in composite wastewater (wt. %)	95
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
pH	7

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-16-2010
GreenBack Pre-treatment 1,2,4-TRIMETHYLBENZENE 6 Oil Treating Tank

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	27.5055	.00041	.	.0112
2	CUMENE (isopropylbenzene)	6.4728	.00003	.	.0002
3	ETHYLBENZENE	37.974	.00005	.	.0018
4	OIL (decane as surrogate)	1683.801	.	.	.0072
5	TOLUENE	272.9819	.00008	.	.022
6	XYLENE	434.9537	.00002	.	.0094
7	METHANOL	.0372	.00071	.	.
8	BUTYL BENZENE	3.9849	.00001	.	.
9	PROPYL(-n) BENZENE	9.4363	.00002	.	.0002
10	TRIMETHYLBENZENE (1,3,5)	66.6067	.00001	.	.0008
11	CYMENE,para	2.6969	.00001	.	.
12	sec BUTYLBENZENE	1.4554	.	.	.
13	1,2,4-TRIMETHYLBENZENE	63.8436	.00001	.	.0007
	TOTALS	2611.75			.0535

The total air emissions are 1.69 Mg/yr

1.56 tons/yr

storage tank (no. 6)

Description of unit	Oil Treatig Tnk
Wastewater temperature (C)	25
Open surface area of tank (m2)	
Density of liquid in tank (g/cc)	0.78
tank waste Mwt, water=18	180
unit storage time (days)	
tank paint factor	0.6
tank diameter (m)	3.657
tank vapor space height (m)	0.91
diurnal temp. change (deg.C)	25
tank height (m)	6.096
oil in composite wastewater (wt. %)	99
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
pH	7

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-16-2010
GreenBack Pre-treatment 1,2,4-TRIMETHYLBENZENE 7 Oil SalesTank #7

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	27.4942	.0004	.	.011
2	CUMENE (isopropylbenzene)	6.4726	.00002	.	.0002
3	ETHYLBENZENE	37.9722	.00004	.	.0017
4	OIL (decane as surrogate)	1683.794	.	.	.007
5	TOLUENE	272.9599	.00008	.	.0216
6	XYLENE	434.9443	.00002	.	.0092
7	METHANOL	.0371	.00064	.	.
8	BUTYL BENZENE	3.9849	.00001	.	.
9	PROPYL(-n) BENZENE	9.4361	.00002	.	.0002
10	TRIMETHYLBENZENE (1,3,5)	66.6059	.00001	.	.0007
11	CYMENE,para	2.6968	.00001	.	.
12	sec BUTYLBENZENE	1.4554	.	.	.
13	1,2,4-TRIMETHYLBENZENE	63.843	.00001	.	.0006
	TOTALS	2611.696			.0522

The total air emissions are 1.65 Mg/yr

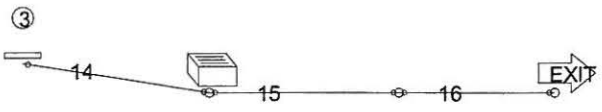
1.82 tons/yr

storage tank (no. 7)

Description of unit	Oil SalesTnk 7
Wastewater temperature (C)	25
Open surface area of tank (m2)	
Density of liquid in tank (g/cc)	0.78
tank waste Mwt, water=18	180
unit storage time (days)	
tank paint factor	0.6
tank diameter (m)	3.657
tank vapor space height (m)	0.91
diurnal temp. change (deg.C)	11
tank height (m)	6.096
oil in composite wastewater (wt. %)	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
pH	7

SECTION B

WATER 9 ANALYSIS – DAF UNIT



No.	Name	Type	flow (l/s)
14	default hard piped	hard piped, no headspace	
15	DAF Unit	DAF or grit separator	8.39
16	def.system exit st	system exit stream	8.39

DAF Water Quality Input

UNIT CONCENTRATION SUMMARY 03-17-2010 15:48:48
GreenBack Pre-treatment
Project H:\Documents\DAF 3/16/2010 12:47:02 PM
The selected unit is 14 default hard piped

COMPOUND NAME	Cin (PPMW)	Air fe	Removal fbio	Cout (ppmw)
BENZENE	9.78	.	.	9.78
CUMENE (isopropylbenzene)	0.0837	.	.	0.0837
ETHYLBENZENE	15.66	.	.	15.66
OIL (decane as surrogate)	200.	.	.	200.
TOLUENE	38.	.	.	38.
XYLENE	60.	.	.	60.
METHANOL	450.	.	.	450.
BUTYL BENZENE	1.e-20	.	.	1.e-20
PROPYL(-n) BENZENE	1.e-20	.	.	1.e-20
TRIMETHYLBENZENE (1,3,5)	1.011	.	.	1.011
CYMENE,para	1.e-20	.	.	1.e-20
sec BUTYLBENZENE	1.e-20	.	.	1.e-20
1,2,4-TRIMETHYLBENZENE	1.219	.	.	1.219
HEXANE(-n)	8.43	.	.	8.43

TOTAL ALL COMPOUNDS 0.00E+00 g/s air emissions

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-17-2010
GreenBack Pre-treatment HEXANE(-n) 15 DAF Unit

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	.0821	.18979	.	.0156
2	CUMENE (isopropylbenzene)	.0007	.3722	.	.0003
3	ETHYLBENZENE	.1314	.25279	.	.0332
4	OIL (decane as surrogate)	1.678	1.	.	1.678
5	TOLUENE	.3188	.21474	.	.0685
6	XYLENE	.5034	.22847	.	.115
7	METHANOL	3.7755	.00027	.	.001
8	BUTYL BENZENE	.	.28687	.	.
9	PROPYL(-n) BENZENE	.	.30924	.	.
10	TRIMETHYLBENZENE (1,3,5)	.0085	.17006	.	.0014
11	CYMENE,para	.	.20315	.	.
12	sec BUTYLBENZENE	.	.40965	.	.
13	1,2,4-TRIMETHYLBENZENE	.0102	.1941	.	.002
14	HEXANE(-n)	.0707	1.	.	.0707
	TOTALS	6.5793			1.9857

The total air emissions are 62.62 Mg/yr

DAF or grit separator (no. 4)

Description of unit	DAF Unit #
Wastewater temperature (C)	25
KL unit surface (m/s)	0.001
Pretreatment length (m)	4
Pretreatment width (m)	4
Pretreatment depth (m)	3
air flow (m3/s)	0.007079
oil in composite wastewater (wt. %)	
fraction surface covered with float	0.2
Oil molecular weight	180
Density of oil (g/cc)	0.78
reserved...	
reserved...	
reserved...	
vent air emission control factor	
cover vent rate (m3/s per m2 surface)	0.0005
If covered, then enter 1	1
reserved...	
pH	7

Date: 3/1 `10

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1012 Centre Avenue
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(970) 490-1414

CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Received Date: 1/29/2010
Matrix: Water
Project ID: 11727AA

Sample Number	Date	Sample Depth (ft)	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Total Xylenes mg/L	MTBE mg/L	GRO (TVPH) mg/L	DRO (TEPH) mg/L	Other Analytes? (y/n)	Rationale	Lab ID	Date Analyzed
Composite	01/28/10		4.58	8.04	< 1.0	5.57		N/A	208			9952-07	2/9/2010
EN-1	01/28/10		6.83	18	1.22	18.3		58.9	18.4			9952-01	2/9/2010
EN-2	01/28/10		10.4	40.3	3.82	58.5		167	N/A			9952-02	2/9/2010
EN-3	01/28/10		2.93	4.37	< 1.0	2.82		10.1	16			9952-03	2/9/2010
EN-4	01/28/10		4.43	8.77	< 1.0	5.41		18.6	168			9952-04	2/9/2010
EN-5	01/28/10		23.7	137	15.6	252		1977	29.1			9952-05	2/9/2010
EN-6	01/28/10		5.83	14.1	< 1.0	13.2		110	26.2			9952-06	2/9/2010

BTEX VALUES INPUT FOR DAF MODEL - DAO OF 200 mg/L USED

(9.78333 38.43 6.88 50.8286) 390.267 77.6167

⟨6.84833 26.901 4.816 35.58⟩ 273.187 54.3317

↳ EFFLUENT CONCENTRATIONS FROM DAF

BTEXMG Method: EPA-8260B

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-1
Laboratory ID 9952-01

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	6.68	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	18760	mg/L	EPA-160.1	02/02/10
N/A	TSS	41	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	18.4	mg/L	EPA-8015B	02/06/10
	Methanol	89.9	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	6.83	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	18.0	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	1.22	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	18.3	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	58.9	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	4.0	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	96	68-120
Toluene-d8	104	81-128
Bromofluorobenzene	86	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-2
Laboratory ID 9952-02

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	6.98	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	17800	mg/L	EPA-160.1	02/02/10
N/A	TSS	27	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	15.1	mg/L	EPA-8015B	02/06/10
	Methanol	120	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	10.4	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	40.3	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	3.82	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	58.5	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	167	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	9.69	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	93	68-120
Toluene-d8	103	81-128
Bromofluorobenzene	97	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-3
Laboratory ID 9952-03

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	6.83	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	16910	mg/L	EPA-160.1	02/02/10
N/A	TSS	54	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	16.0	mg/L	EPA-8015B	02/06/10
	Methanol	344	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	2.93	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	4.37	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	< 1.0	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	2.82	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	10.1	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	< 1.0	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	93	68-120
Toluene-d8	103	81-128
Bromofluorobenzene	85	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
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Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-4
Laboratory ID 9952-04

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	7.10	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	19380	mg/L	EPA-160.1	02/02/10
N/A	TSS	27	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	168	mg/L	EPA-8015B	02/06/10
	Methanol	4189	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	4.43	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	8.77	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	< 1.0	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	5.41	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	18.6	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	< 1.0	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	92	68-120
Toluene-d8	103	81-128
Bromofluorobenzene	85	70-113

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CERTIFICATE OF ANALYSIS

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Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-5
Laboratory ID 9952-05

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	6.97	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	17640	mg/L	EPA-160.1	02/02/10
N/A	TSS	27	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	29.1	mg/L	EPA-8015B	02/06/10
	Methanol	86.4	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	23.7	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	137	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	15.6	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	252	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	1977	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	37.2	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	93	68-120
Toluene-d8	101	81-128
Bromofluorobenzene	88	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: EN-6
Laboratory ID 9952-06

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	6.80	Units	EPA-150.1	02/09/10
	Total Dissolved Solids (TDS)	19190	mg/L	EPA-160.1	02/02/10
N/A	TSS	5867	mg/L	EPA-160.2	02/02/10
N/A	DRO (TEPH)	26.2	mg/L	EPA-8015B	02/06/10
	Methanol	118	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	5.83	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	14.1	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	< 1.0	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	13.2	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	110	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	< 1.0	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	95	68-120
Toluene-d8	102	81-128
Bromofluorobenzene	84	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sampled: 01/28/10
Received: 01/29/10

Sample ID: Composite
Laboratory ID 9952-07

Project No.: 11727AA
Matrix: Water

CAS Number	Parameter	Result	Units	Method	Date Analyzed
N/A	pH	7.03	Units	EPA-150.1	02/09/10
N/A	DRO (TEPH)	208	mg/L	EPA-8015B	02/08/10
	Methanol	859	mg/L	EPA-8015B Modified	02/09/10
71-43-2	Benzene	4.58	mg/L	EPA-8260B	02/09/10
108-88-3	Toluene	8.04	mg/L	EPA-8260B	02/09/10
100-41-4	Ethylbenzene	< 1.0	mg/L	EPA-8260B	02/09/10
1330-20-7	Total Xylenes	5.57	mg/L	EPA-8260B	02/09/10
N/A	GRO (TVPH)	65.3	mg/L	EPA-8260B	02/09/10
540-84-1	Iso-octane	< 1.0	mg/L	EPA-8260B	02/09/10
110-54-3	n-Hexane	< 1.0	mg/L	EPA-8260B	02/09/10

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	96	68-120
Toluene-d8	102	81-128
Bromofluorobenzene	83	70-113

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CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Sample ID: Composite
Laboratory ID: 9952-07

Sampled: 01/28/10
Received: 01/29/10
Analyzed: 02/12/10
Project No.: 11727AA
Method: EPA-8260B
Matrix: Water

CAS Number	Parameter	Result µg/L	MDL µg/L	CAS Number	Parameter	Result µg/L	MDL µg/L
71-43-2	Benzene	4580	0.5	108-88-3	Toluene	8040	0.5
100-41-4	Ethylbenzene	711	0.5	1330-20-7	Total Xylenes	5570	0.5
91-20-3	Naphthalene	< 0.5	0.5	75-01-4	Vinyl Chloride	< 0.5	0.5
74-87-3	Chloromethane	< 0.5	0.5	74-83-9	Bromomethane	< 0.5	0.5
75-00-3	Chloroethane	< 0.5	0.5	75-69-4	Trichlorofluoromethane	< 0.5	0.5
75-35-4	1,1-Dichloroethene	< 0.5	0.5	156-60-5	trans-1,2-Dichloroethene	< 0.5	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5	0.5	75-09-2	Methylene Chloride	< 0.5	0.5
75-34-3	1,1-Dichloroethane	< 0.5	0.5	74-97-5	Bromochloromethane	< 0.5	0.5
67-66-3	Chloroform	< 0.5	0.5	71-55-6	1,1,1-Trichloroethane	< 0.5	0.5
56-23-5	Carbon Tetrachloride	< 0.5	0.5	107-06-2	1,2-Dichloroethane	< 0.5	0.5
79-01-6	Trichloroethene	< 0.5	0.5	78-87-5	1,2-Dichloropropane	< 0.5	0.5
75-27-4	Bromodichloromethane	< 0.5	0.5	74-95-3	Dibromomethane	< 0.5	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5	0.5	142-28-9	1,3-Dichloropropane	< 0.5	0.5
590-20-7	2,2-Dichloropropane	< 0.5	0.5	563-58-6	1,1-Dichloropropene	< 0.5	0.5
10061-01-5	cis-1,3-Dichloropropene	< 0.5	0.5	10061-02-6	trans-1,3-Dichloropropene	< 0.5	0.5
127-18-4	Tetrachloroethene	< 0.5	0.5	106-93-4	1,2-Dibromoethane (EDB)	< 0.5	0.5
124-48-1	Dibromochloromethane	< 0.5	0.5	108-90-7	Chlorobenzene	< 0.5	0.5
630-20-6	1,1,1,2-Tetrachloroethane	< 0.5	0.5	100-42-5	Styrene	< 0.5	0.5
75-25-2	Bromoform	< 0.5	0.5	79-34-5	1,1,2,2-Tetrachloroethane	< 0.5	0.5
98-82-8	Isopropylbenzene	83.7	0.5	108-86-1	Bromobenzene	< 0.5	0.5
103-65-1	n-Propylbenzene	81.6	0.5	95-49-8	2-Chlorotoluene	< 0.5	0.5
106-43-4	4-Chlorotoluene	< 0.5	0.5	108-67-8	1,3,5-Trimethylbenzene	1011	0.5
95-63-6	1,2,4-Trimethylbenzene	1219	0.5	98-06-6	tert-Butylbenzene	< 0.5	0.5
135-98-8	sec-Butylbenzene	1404	0.5	541-73-1	1,3-Dichlorobenzene	< 0.5	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5	0.5	99-87-6	4-Isopropyltoluene	70.1	0.5
104-51-8	n-Butylbenzene	< 0.5	0.5	120-82-1	1,2,4-Trichlorobenzene	< 0.5	0.5
87-61-6	1,2,3-Trichlorobenzene	< 0.5	0.5	87-68-3	Hexachlorobutadiene	< 0.5	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5	0.5				

QA/QC SURROGATE RECOVERIES

Compound	% Recovery	% Rec. Limits
Dibromofluoromethane	113	68-120
Toluene-d8	97	81-128
Bromofluorobenzene	108	70-113

Bree Emery
TECHNOLOGY LABORATORY, INC.

TECHNOLOGY LABORATORY, INC.

1012 CENTRE AVENUE
FORT COLLINS, CO 80526
Phone: (970) 490-1414 Fax: (970) 472 5488
www.techlabusa.com sales@techlabusa.com

W.O. NUMBER 9952

CHAIN-OF-CUSTODY REPORT

COMPANY NAME: CGRS, INC.
PROJECT MANAGER: J. ADAMS
PROJECT NUMBER: 11727 AA
PROJECT LOCATION OR NAME: GREENBACK PRODUCED WATER LLC.
SAMPLERS SIGNATURE:

LAB #	SAMPLE ID	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL (S) AIR (A) AQUEOUS (W) OTHER (O)	NUMBER OF CONTAINERS	BTEX / ~~MTBE~~ / TVPH	TEPH (DRO)	TRPH 418.1	Oil & Grease 413.1 / 1664	VOC 624 / 8260 TOTAL / TCLP	SVOC 625 / 8270 / PAH	pH / TSS / TDS	RCRA 8 METALS (TOTAL / TCLP / DISSOLVED)	React. / Ignita. / Corr. / Paint Filter	TO-1 / TO-14 / TO-15 / TVPH	NITRATE / NITRITE / AMMONIA	BOD / COD	FIXED GASES (N_2, O_2, CO_2, CH_4)	PCBs							HOLD AFTER ANALYSIS	HOLD, DON'T ANALYZE
1	EN-1	01/28/2010	W	4	X	X					X															
2	EN-2		W	4	X	X					X															
3	EN-3		W	4	X	X					X															
4	EN-4		W	4	X	X					X															
5	EN-5		W	4	X	X					X															
6	EN-6		W	4	X	X					X															
7	~~EN-7~~ N/A																									
8																										
9																										
10																										
11																										
12																										

PAGE 1 OF 1

TURNAROUND TIME

- [x] Normal (5-10 working days)
- [ ] 3 day (1.5x Normal Rates)
- [ ] 24 hr (2x Normal Rates)
- [ ] Same day (4x Normal Rates)

COMMENTS:

RELINQUISHED BY:
COMPANY:
RELINQUISHED BY:
COMPANY: CGRS

LOGGED IN BY:
DATE: 1/29/10
TIME: 11:30
DATE:
TIME:

Sample Preservative: [x] 4°C [ ] None [ ] Other [ ] Acid

RECEIVED BY: Bill Emery
COMPANY: TLI
RECEIVED BY:
COMPANY:

D.C. #133

SECTION C

AIR STRIPPER ANALYSIS

VOC Mass Balance Estimations - Liquid to Gas Phase

	TPH	Benzene	Toluene	Ethyl-benzen	Xylenes
Air Stripper Flow Rate (cfm)	2100	2100	2100	2100	2100
Influent VOC Concentration (mg/L)	305	6.84	26.9	4.8	35.58
Influent Flow Rate (gpm)	145	145	145	145	145
Liters as Vapor Hydrocarbon	45.36	1.37	4.56	0.71	5.23
moles/L	1.594205952	0.048059954	0.160245224	0.024812659	0.183924
PPM(v)	762.7112115	22.99318079	76.6656459	11.87104661	87.99413
lbs/Cubic Foot	0.000207958	4.66372E-06	1.83412E-05	3.27278E-06	2.43E-05
Run Time (hrs)	24.00	24.00	24.00	24.00	24.00
BBLs/Day (water intake)	4971.43	4971.43	4971.43	4971.43	4971.43
Tons/Yr (Vapor Emissions)	114.77	2.57	10.12	1.81	13.39

Note: Concentrations estimated from Water 9 DAF effluent concentrations

Date: 3/1[illegible]2010

TECHNOLOGY LABORATORY INC.
CENTRE PROFESSIONAL PARK
1012 Centre Avenue
Fort Collins, Colorado 80526
(970) 490-1414

CERTIFICATE OF ANALYSIS

CGRS, INC.
PO Box 1489
Fort Collins, CO 80522

Received Date: 1/29/2010
Matrix: Water
Project ID: 11727AA

Sample Number	Date	Sample Depth	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	GRO (TVPH)	DRO (TEPH)	Other Analytes?	Rationale	Lab ID	Date Analyzed
		(ft)	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	(y/n)			
Composite	01/28/10		4.58	8.04	< 1.0	5.57		N/A	208			9952-07	2/9/2010
EN-1	01/28/10		6.83	18	1.22	18.3		58.9	18.4			9952-01	2/9/2010
EN-2	01/28/10		10.4	40.3	3.82	58.5		167	N/A			9952-02	2/9/2010
EN-3	01/28/10		2.93	4.37	< 1.0	2.82		10.1	16			9952-03	2/9/2010
EN-4	01/28/10		4.43	8.77	< 1.0	5.41		18.6	168			9952-04	2/9/2010
EN-5	01/28/10		23.7	137	15.6	252		1977	29.1			9952-05	2/9/2010
EN-6	01/28/10		5.83	14.1	< 1.0	13.2		110	26.2			9952-06	2/9/2010

9.78333 38.43 6.88 50.8286 390.267 77.6167

⟨6.84833 26.901 4.816 35.58⟩ 273.187 54.3317

BTEX AS. INFLUENT

EFFLUENT BASED ON REDUCTION EFF.

99% AS. Red

64% A.S. REED
34.77 mg/L USED AS OIL CONC. IN POND INPUT.

BTEXMG Method: EPA-8260B

TECHNOLOGY LABORATORY, INC

STAT MODEL CALCULATIONS 02/12/10
VERSION 4.1 13:16:26

EPG COMPANIES INC.
19900 COUNTY ROAD 81, MAPLE GROVE, MN 55311
PHONE: 763-424-2613 FAX: 763-493-4812

UNIT MODEL:	STAT 400	WATER TEMPERATURE (F):	55.0
WATER FLOW RATE (GPM):	150.0	AIR TEMPERATURE (F):	55.0
AIR FLOW RATE (ACFM):	2100.0	AIR-TO-WATER RATIO:	105:1
OPERATING PRESS (ATM):	1.0	SAFETY FACTOR (%):	15.0

Influent Conc. for BENZENE 9000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	76.11799	2149.3810	65.2440	12.3365
2	94.09651	531.3140	80.6542	15.2504
3	98.52851	132.4344	84.4530	15.9686
4	99.63246	33.0785	85.3993	16.1476
5	99.90815	8.2663	85.6356	16.1923
6	99.97704	2.0660	85.6946	16.2034

Influent Conc. for TOLUENE 37000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	72.03174	10348.2551	253.8261	47.9943
2	91.87647	3005.7060	323.7552	61.2167
3	97.61517	882.3870	343.9773	65.0403
4	99.29771	259.8488	349.9062	66.1614
5	99.79300	76.5912	351.6515	66.4914
6	99.93897	22.5815	352.1659	66.5887

Influent Conc. for ETHYLBENZENE 10000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	73.86412	2613.5883	70.3468	13.3014
2	92.97640	702.3604	88.5489	16.7431
3	98.09863	190.1365	93.4273	17.6655
4	99.48426	51.5737	94.7469	17.9151
5	99.86003	13.9966	95.1048	17.9827
6	99.96201	3.7991	95.2019	18.0011

Influent Conc. for XYLENES (TOTAL) 59000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	74.46140	15067.7757	418.4021	79.1128
2	93.30392	3950.6861	524.2792	99.1324
3	98.23240	1042.8831	551.9725	104.3688
4	99.53257	275.7852	559.2782	105.7502
5	99.87633	72.9643	561.2099	106.1154
6	99.96728	19.3065	561.7209	106.2120

Influent Conc. for TPH AS GAS(ASSUME BENZENE) 59000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	76.11799	14090.3863	427.7106	80.8729
2	94.09651	3483.0586	528.7328	99.9745
3	98.52851	868.1811	553.6364	104.6834
4	99.63246	216.8477	559.8395	105.8563
5	99.90815	54.1904	561.3887	106.1492
6	99.97704	13.5440	561.7758	106.2224

Influent Conc. for METHANOL 100000.0 ppb

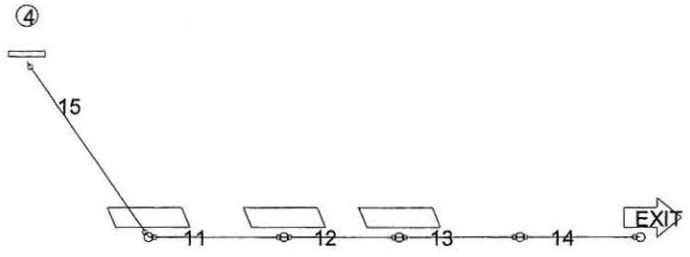
NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	0.37944	99620.5628	3.6137	0.6833
2	0.61863	99381.3722	5.8917	1.1140
3	0.76975	99230.2464	7.3310	1.3862
4	0.86538	99134.6243	8.2417	1.5584
5	0.92593	99074.0660	8.8184	1.6674
6	0.96431	99035.6918	9.1839	1.7365

Influent Conc. for TOTAL VOCs 274000.0 ppb

NO OF TRAY	REMOVAL EFF %	EFF CONC ppb	OFF-GAS CONC ug/l	AIR EMISSION lb/d
1	47.48542	143889.9491	1239.1433	234.3013
2	59.46916	111054.4972	1551.8619	293.4311
3	62.64735	102346.2685	1634.7974	309.1128
4	63.51396	99971.7582	1657.4118	313.3888
5	63.75910	99300.0748	1663.8088	314.5984
6	63.83322	99096.9890	1665.7430	314.9641

SECTION D

POND WATER 9 MODEL



No.	Name	Type	flow (l/s)
11	Pond Storage 8.1	lagoon	8.39
12	Pond Storage 8.2	lagoon	8.39
13	Pond Storage 8.3	lagoon	8.39
14	def.system exit st	system exit stream	8.39
15	default hard piped	hard piped, no headspace	8.39

POND WATER QUALITY INPUT

UNIT CONCENTRATION SUMMARY 03-19-2010 11:04:58
GreenBack Emission Estimates
Project H:\Documents\Pond 3/16/2010 4:42:24 PM
The selected unit is 15 default hard piped

COMPOUND NAME	Cin (PPMW)	Air fe	Removal fbio	Cout (ppmw)
BENZENE	0.00246	.	.	0.00246
CUMENE (isopropylbenzene)	1.e-20	.	.	1.e-20
ETHYLBENZENE	0.003799	.	.	0.003799
OIL (decane as surrogate)	34.77	.	.	34.77
TOLUENE	0.0234	.	.	0.0234
XYLENE	0.019307	.	.	0.019307
METHANOL	412.	.	.	412.
HEXANE(-n)	0.00848	.	.	0.00848

TOTAL ALL COMPOUNDS 0.00E+00 g/s air emissions

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-19-2010
GreenBack Emission Estimates HEXANE(-n) 11 Pond Storage 8.1

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	.	.11291	.8237	.
2	CUMENE (isopropylbenzene)	.	.0481	.91758	.
3	ETHYLBENZENE	.	.06784	.88667	.
4	OIL (decane as surrogate)	.2917	.02662	.9534	.0078
5	TOLUENE	.0002	.06398	.89581	.
6	XYLENE	.0002	.08669	.86173	.
7	METHANOL	3.4567	.30993	.26735	1.0713
8	HEXANE(-n)	.0001	.09246	.8455	.
	TOTALS	3.7489			1.0791

The total air emissions are 34.03 Mg/yr

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-19-2010
GreenBack Emission Estimates HEXANE(-n) 12 Pond Storage 8.2

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	.	.11291	.8237	.
2	CUMENE (isopropylbenzene)	.	.0481	.91758	.
3	ETHYLBENZENE	.	.06783	.88668	.
4	OIL (decane as surrogate)	.0058	.02073	.96372	.0001
5	TOLUENE	.	.06397	.89581	.
6	XYLENE	.	.08668	.86174	.
7	METHANOL	1.4612	.25846	.38901	.3777
8	HEXANE(-n)	.	.09246	.8455	.
	TOTALS	1.4671			.3778

The total air emissions are 11.91 Mg/yr

WASTEWATER TREATMENT UNIT AIR EMISSIONS 03-19-2010
GreenBack Emission Estimates HEXANE(-n) 13 Pond Storage 8.3

No.	Name	loading (g/s)	FE.	FBIO	EMISS. (g/s)
1	BENZENE	.	.11291	.8237	.
2	CUMENE (isopropylbenzene)	.	.0481	.91758	.
3	ETHYLBENZENE	.	.06783	.88668	.
4	OIL (decane as surrogate)	.0001	.02063	.96388	.
5	TOLUENE	.	.06397	.89581	.
6	XYLENE	.	.08668	.86174	.
7	METHANOL	.5151	.22429	.46981	.1155
8	HEXANE(-n)	.	.09246	.8455	.
	TOTALS	.5152			.1155

The total air emissions are 3.64 Mg/yr

lagoon (no. 11)

Description of unit	Pond Storae 81
Wastewater temperature (C)	25
Length of impoundment (m)	67.056
Depth of impoundment (m)	1.8288
Width of impoundment (m)	45.72
active biomass, impoundment (g/l)	0.05
if there is plug flow, enter 1	
time for emissions in lagoon (months)	
Overall biorate (mg/g bio-hr)	19
sorption flag for solids settling =1	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
reserved...	
pH	

SECTION E

EPA TANKS ANALYSES

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Treat Tank
City:	Rifle
State:	Colorado
Company:	GreenBack Produced Water Recovery, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	400 bbl Oil Treating Tanks

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		17.00
Avg. Liquid Height (ft):		17.00
Volume (gallons):		14,382.50
Turnovers:		210.12
Net Throughput(gal/yr):		3,022,051.65
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome	
Height (ft)		25.00
Radius (ft) (Dome Roof)		12.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Treat Tank - Vertical Fixed Roof Tank
Rifle, Colorado

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	60.92	50.34	71.50	55.17	2.9302	2.3720	3.5895	50.0000			207.00	Option 4: RVP=5
Benzene						1.1980	0.8879	1.5932	78.1100	0.0040	0.0067	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Distillate fuel oil no. 2						0.0067	0.0046	0.0095	130.0000	0.2200	0.0014	188.00	Option 1: VP60 = .0065 VP70 = .009
Ethylbenzene						0.1121	0.0769	0.1602	106.1700	0.0046	0.0007	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Gasoline (RVP 7)						3.5505	2.8517	4.3822	68.0000	0.2600	0.9640	92.00	Option 4: RVP=7, ASTM Slope=3
Isopropyl benzene						0.0498	0.0332	0.0731	120.2000	0.0008	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Residual oil no. 6						0.0000	0.0000	0.0001	190.0000	0.1150	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006
Toluene						0.3397	0.2427	0.4679	92.1300	0.0340	0.0163	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						-9.1819	-3.3868	-3.3947	0.6987	0.3096	0.0038	-733.44	
Xylenes (mixed isomers)						0.0933	0.0638	0.1339	106.1700	0.0520	0.0069	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Treat Tank - Vertical Fixed Roof Tank
Rifle, Colorado

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	2,446.60	1,101.83	3,548.43
Benzene	16.48	7.42	23.90
Toluene	39.93	17.98	57.91
Xylenes (mixed isomers)	16.78	7.56	24.33
Gasoline (RVP 7)	2,358.58	1,062.19	3,420.77
Residual oil no. 6	0.01	0.00	0.01
Isopropyl benzene	0.13	0.06	0.19
Distillate fuel oil no. 2	3.54	1.59	5.13
Ethylbenzene	1.79	0.80	2.59
Unidentified Components	9.36	4.22	13.58

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Oil Sales Tank
City:	Rifle
State:	Colorado
Company:	GreenBack Produced Water Recovery, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	Heated Oil Sales Tank

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		17.00
Avg. Liquid Height (ft):		17.00
Volume (gallons):		14,382.50
Turnovers:		210.12
Net Throughput(gal/yr):		3,022,051.65
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome	
Height (ft)		25.00
Radius (ft) (Dome Roof)		12.00

Breather Vent Settings

Vacuum Settings (psig):	-0.13
Pressure Settings (psig)	0.25

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Oil Sales Tank - Vertical Fixed Roof Tank
Rifle, Colorado

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	60.92	50.34	71.50	55.17	2.9302	2.3720	3.5895	50.0000			207.00	Option 4: RVP=5
Benzene						1.1980	0.8879	1.5932	78.1100	0.0040	0.0067	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Distillate fuel oil no. 2						0.0067	0.0046	0.0095	130.0000	0.2200	0.0014	188.00	Option 1: VP60 = .0065 VP70 = .009
Ethylbenzene						0.1121	0.0769	0.1602	106.1700	0.0046	0.0007	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Gasoline (RVP 7)						3.5505	2.8517	4.3822	68.0000	0.2600	0.9640	92.00	Option 4: RVP=7, ASTM Slope=3
Isopropyl benzene						0.0498	0.0332	0.0731	120.2000	0.0008	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Residual oil no. 6						0.0000	0.0000	0.0001	190.0000	0.1150	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006
Toluene						0.3397	0.2427	0.4679	92.1300	0.0340	0.0163	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						-9.1819	-3.3868	-3.3947	0.6987	0.3096	0.0038	-733.44	
Xylenes (mixed isomers)						0.0933	0.0638	0.1339	106.1700	0.0520	0.0069	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Oil Sales Tank - Vertical Fixed Roof Tank
Rifle, Colorado

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	2,446.60	1,104.33	3,550.93
Benzene	16.48	7.44	23.92
Toluene	39.93	18.02	57.95
Xylenes (mixed isomers)	16.78	7.57	24.35
Gasoline (RVP 7)	2,358.58	1,064.60	3,423.18
Residual oil no. 6	0.01	0.00	0.01
Isopropyl benzene	0.13	0.06	0.19
Distillate fuel oil no. 2	3.54	1.60	5.14
Ethylbenzene	1.79	0.81	2.59
Unidentified Components	9.36	4.23	13.59

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Gun Barrel
City:	Rifle
State:	Colorado
Company:	GreenBack Produced Water Recovery, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	Vertical Oil-Water Separator

Tank Dimensions

Shell Height (ft):		27.00
Diameter (ft):		12.60
Liquid Height (ft) :		24.00
Avg. Liquid Height (ft):		24.00
Volume (gallons):		22,385.94
Turnovers:		135.00
Net Throughput(gal/yr):		3,022,102.42
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome	
Height (ft)		25.00
Radius (ft) (Dome Roof)		12.60

Breather Vent Settings

Vacuum Settings (psig):	-0.13
Pressure Settings (psig)	0.25

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Gun Barrel - Vertical Fixed Roof Tank
Rifle, Colorado

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	60.92	50.34	71.50	55.17	2.9302	2.3720	3.5895	50.0000			207.00	Option 4: RVP=5
Benzene						1.1980	0.8879	1.5932	78.1100	0.0040	0.0067	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Distillate fuel oil no. 2						0.0067	0.0046	0.0095	130.0000	0.2200	0.0014	188.00	Option 1: VP60 = .0065 VP70 = .009
Ethylbenzene						0.1121	0.0769	0.1602	106.1700	0.0046	0.0007	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Gasoline (RVP 7)						3.5505	2.8517	4.3822	68.0000	0.2600	0.9640	92.00	Option 4: RVP=7, ASTM Slope=3
Isopropyl benzene						0.0498	0.0332	0.0731	120.2000	0.0008	0.0001	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Residual oil no. 6						0.0000	0.0000	0.0001	190.0000	0.1150	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006
Toluene						0.3397	0.2427	0.4679	92.1300	0.0340	0.0163	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						-9.1819	-3.3868	-3.3947	0.6987	0.3096	0.0038	-733.44	
Xylenes (mixed isomers)						0.0933	0.0638	0.1339	106.1700	0.0520	0.0069	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Gun Barrel - Vertical Fixed Roof Tank
Rifle, Colorado

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	3,074.79	1,210.67	4,285.46
Benzene	20.71	8.16	28.87
Toluene	50.18	19.76	69.94
Xylenes (mixed isomers)	21.09	8.30	29.39
Gasoline (RVP 7)	2,964.18	1,167.11	4,131.29
Residual oil no. 6	0.01	0.00	0.01
Isopropyl benzene	0.17	0.07	0.23
Distillate fuel oil no. 2	4.45	1.75	6.20
Ethylbenzene	2.24	0.88	3.13
Unidentified Components	11.77	4.63	16.40

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Oil Sales Tank ID #8 Gas RVP 7
City:	Rifle
State:	Colorado
Company:	GreenBack Produced Water, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	Condenstate Oil Sales Tank

Tank Dimensions

Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	17.00
Avg. Liquid Height (ft):	17.00
Volume (gallons):	14,382.50
Turnovers:	210.12
Net Throughput(gal/yr):	3,022,051.65
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	20.00
Radius (ft) (Dome Roof)	12.00

Breather Vent Settings

Vacuum Settings (psig):	-0.13
Pressure Settings (psig)	0.25

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Oil Sales Tank ID #8 Gas RVP 7 - Vertical Fixed Roof Tank
Rifle, Colorado

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 7)	All	60.92	50.34	71.50	55.17	3.5505	2.8517	4.3822	68.0000			92.00	Option 4: RVP=7, ASTM Slope=3
Gasoline (RVP 7)						3.5505	2.8517	4.3822	68.0000	0.5900	0.5900	92.00	Option 4: RVP=7, ASTM Slope=3
Residual oil no. 6						0.0000	0.0000	0.0001	190.0000	0.2200	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006
Unidentified Components						4.0696	2.6978	2.6978	67.9998	0.1900	0.4100	48.87	

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Oil Sales Tank ID #8 Gas RVP 7 - Vertical Fixed Roof Tank
Rifle, Colorado

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 7)	5,375.68	1,814.97	7,190.65
Gasoline (RVP 7)	3,171.65	1,070.83	4,242.48
Residual oil no. 6	0.01	0.00	0.01
Unidentified Components	2,204.02	744.13	2,948.15

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanker Off-Loading
City:	Rifle
State:	Colorado
Company:	GreenBack Produced Water Recovery, LLC
Type of Tank:	Horizontal Tank
Description:	GreenBack Shaeffer Ranch Site

Tank Dimensions

Shell Length (ft):	22.00
Diameter (ft):	8.00
Volume (gallons):	8,000.00
Turnovers:	383.25
Net Throughput(gal/yr):	3,066,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Grand Junction, Colorado (Avg Atmospheric Pressure = 12.37 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

Tanker Off-Loading - Horizontal Tank
Rifle, Colorado

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 5)	All	61.87	50.63	73.11	55.53	2.9851	2.3859	3.6996	50.0000			207.00	Option 4: RVP=5
Benzene						1.2298	0.8953	1.6619	78.1100	0.0040	0.0068	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Ethylbenzene						0.1158	0.0777	0.1689	106.1700	0.0040	0.0006	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Gasoline (RVP 7)						3.6195	2.8690	4.5217	68.0000	0.2500	0.9276	92.00	Option 4: RVP=7, ASTM Slope=3
Residual oil no. 6						0.0000	0.0000	0.0001	190.0000	0.0000	0.0000	387.00	Option 1: VP60 = .00004 VP70 = .00006
Toluene						0.3499	0.2449	0.4906	92.1300	0.0346	0.0168	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.7668	1.5240	1.5519	6.8301	0.6546	0.0411	568.35	
Xylenes (mixed isomers)						0.0965	0.0645	0.1413	106.1700	0.0528	0.0071	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanker Off-Loading - Horizontal Tank
Rifle, Colorado

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	2,001.60	923.10	2,924.71
Benzene	13.66	6.30	19.95
Ethylbenzene	1.29	0.59	1.88
Gasoline (RVP 7)	1,856.66	856.26	2,712.92
Residual oil no. 6	0.00	0.00	0.00
Toluene	33.60	15.50	49.10
Xylenes (mixed isomers)	14.14	6.52	20.67
Unidentified Components	82.26	37.94	120.19

ATTACHMENT D

FORM APCD-101

Form APCD-101

Colorado Department of Public Health and Environment
Air Pollution Control Division

Colorado Department of Public Health and Environment

Company Contact Information Form

Ver. September 10, 2008

Company Name: GreenBack Produced Water Recovery, LLC

Source Name: Shaeffer Ranch Facility

Permit Contact[1]:	JOBY ADAMS - CGRS, INC		
Address:	1301 ACADEMY CT.		
	Street		
	FORT COLLINS	CO	80524
	City	State	Zip
Phone Number:	970-493-7780		
Fax Number:	970-493-7986		
E-mail:	JOBY@CGRS.COM		

Compliance Contact[2]:	JOBY ADAMS - CGRS, INC.		
Address:	1301 ACADEMY CT		
	Street		
	FORT COLLINS	CO	80524
	City	State	Zip
Phone Number:	970-493-7780		
Fax Number:	970-493-7986		
E-mail:	JOBY@CGRS.COM		

Billing Contact: *(Permit Fees)[3]*	DANIEL PACKARD		
Address:	1900 GRANT STREET, SUITE 630		
	Street		
	DENVER	CO	80203
	City	State	Zip
Phone Number:	303-887-8387		
Fax Number:	303-318-9659		
E-mail:	DANPACKARD@AOL.COM		

Billing Contact: *(Annual Fees)[4]*	DANIEL PACKARD		
Address:	1900 GRANT STREET, SUITE 630		
	Street		
	DENVER	CO	80203
	City	State	Zip
Phone Number:	303-887-8387		
Fax Number:	303-318-9659		
E-mail:	DANPACKARD@AOL.COM		

Check how would you like to receive your permit fee invoice?

Mail: [X] E-mail: [ ] Fax: [ ]

Footnotes:

[1] The permit contact should be the point of contact for technical information contained in the permit application. This may be a company representative or a consultant.

[2] The compliance contact should be the point of contact for discussing inspection and compliance at the permitted facility.

[3] The billing contact (Permit fees) should be the point of contact that should receive the invoice for fees associated with processing the permit application & issuing the permit. (Reg. 3, Part A, Section VI.B)

[4] The billing contact (Annual fees) should be the point of contact that should receive the invoices issued on an annual basis for fees associated with actual emissions reported on APENs for the facility. (Reg. 3, Part A, Section VI.C)

ATTACHMENT E

AIR IMPACT ANALYSIS

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ATTACHMENT F

FORM APCD-102

Form APCD-102

Colorado Department of Public Health and Environment
Air Pollution Control Division

Facility Wide Emissions Inventory Form

Ver. September 10, 2008

Colorado Department of Public Health and Environment

Company Name: GreenBack Produced Water Recovery, LLC
Source Name: Shaeffer Ranch Facility
Source AIRS ID: Proposed

		Uncontrolled Potential to Emit (PTE)																Controlled Potential to Emit (PTE)															
		Criteria (TPY)						HAPs (lbs/yr)										Criteria (TPY)							HAPs (lbs/yr)									
AIRS ID	Equipment Description	TSP	PM10	PM2.5	SO2	NOx	CO	VOC	BZ	Tol	EB	Xyl	HCHO	Acetal	Acro	n-Hex	Meth	224-TMP	TSP	PM10	PM2.5	SO2	NOx	CO	VOC	BZ	Tol	EB	Xyl	HCHO	Acetal	Acro	n-Hex	Meth	224-TMP
Proposed	Sump ID #1							5.0	155	1,168	142	1,865					19																	
Proposed	DAF ID#3																							3.5	310	236	118	403				243	7	
Proposed	Oil Tank ID#6							1.9	779	1,530	14	0																						
Proposed	Oil Tank ID#7							1.8	765	1,502	118	639																						
Proposed	Pond ID 8.1							37.5									74,482																	
Proposed	Pond ID 8.2							13.1									26,260																	
Proposed	Pond ID 8.3							4.0									8,030																	
Proposed	Air Stripper ID#4																							57.5	5,914	24,304	6,570	38,767				20,863	634	
Permitted Sources Subtotal =		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**58.3**	**1,543**	**3,031**	**132**	**639**	**0**	**0**	**0**	**0**	**108,772**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**60.9**	**6,225**	**24,540**	**6,688**	**39,170**	**0**	**0**	**0**	**21,106**	**641**	**0**
APEN Only - Permit Exempt Sources																																		
APEN Only Subtotal =		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
APEN Exempt / Insignificant sources																																		
	Gun Barrel ID #5							0.0	7	7	0	7																						
	Filter Box ID #2							0.1	14	56	7	7					0																	
	Off-Loading #9							1.5	20	49	2	21																						
Insignificant Subtotal =		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.5**	**40**	**112**	**9**	**35**	**0**	**0**	**0**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, All Sources =		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**59.9**	**1,584**	**3,143**	**141**	**674**	**0**	**0**	**0**	**0**	**108,772**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**60.9**	**6,225**	**24,540**	**6,688**	**39,170**	**0**	**0**	**0**	**21,106**	**641**	**0**

Uncontrolled HAPs Summary (TPY) =								**0.8**	**1.6**	**0.1**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**54.4**	**0.0**	**Controlled HAPs Summary (TPY) =**								**3.1**	**12.3**	**3.3**	**19.6**	**0.0**	**0.0**	**0.0**	**10.6**	**0.3**	**0.0**
Uncontrolled Total, All HAPs (TPY) =								**57.2**										**Controlled Total, All HAPs (TPY) =**								**49.2**									

Footnotes:

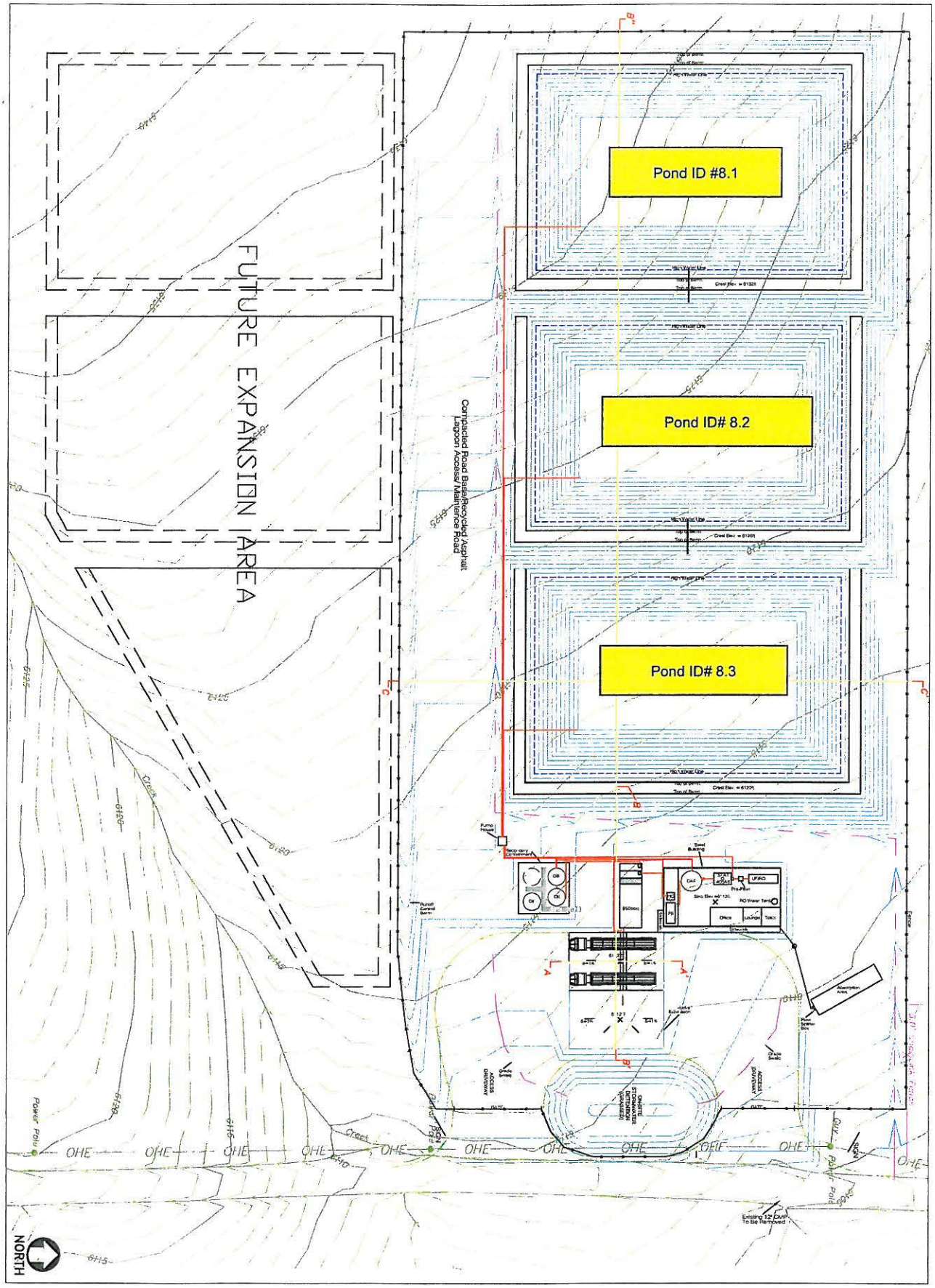
1. This form should be completed to include both existing sources and all proposed new or modifications to existing emissions sources
2. If the emissions source is new then enter "proposed" under the Permit No. and AIRS ID data columns
3. HAP abbreviations include:

BZ = Benzene	**224-TMP** = 2,2,4-Trimethylpentane
Tol = Toluene	**Acetal** = Acetaldehyde
EB = Ethylbenzene	**Acro** = Acrolein
Xyl = Xylene	**n-Hex** = n-Hexane
HCHO = Formaldehyde	**Meth** = Methanol

4. APEN Exempt/Insignificant Sources should be included when warranted.

ATTACHMENT G

PROCESS DESCRIPTION, FACILITY PLOT PLAN AND PROCESS FLOW DIAGRAMS



Sheet No.
S101

FIGURE 2
Site Development Map
GreenBack Shaeffer Ranch
Facility
Garfield County, Colorado

Designed By:
Drawn By: ARG
Checked By:
Date: MARCH 2010
Scale: 1" = 60'

SCALE IN FEET

GREENBACK
PRODUCED WATER
MANAGMENT

RIFLE, COLORADO

CGRS ENVIRONMENTAL CONSTRUCTION COMPLIANCE
P.O. BOX 1489
FORT COLLINS, CO 80522
Tel. (970) 493-7780
Fax. (970) 493-7986

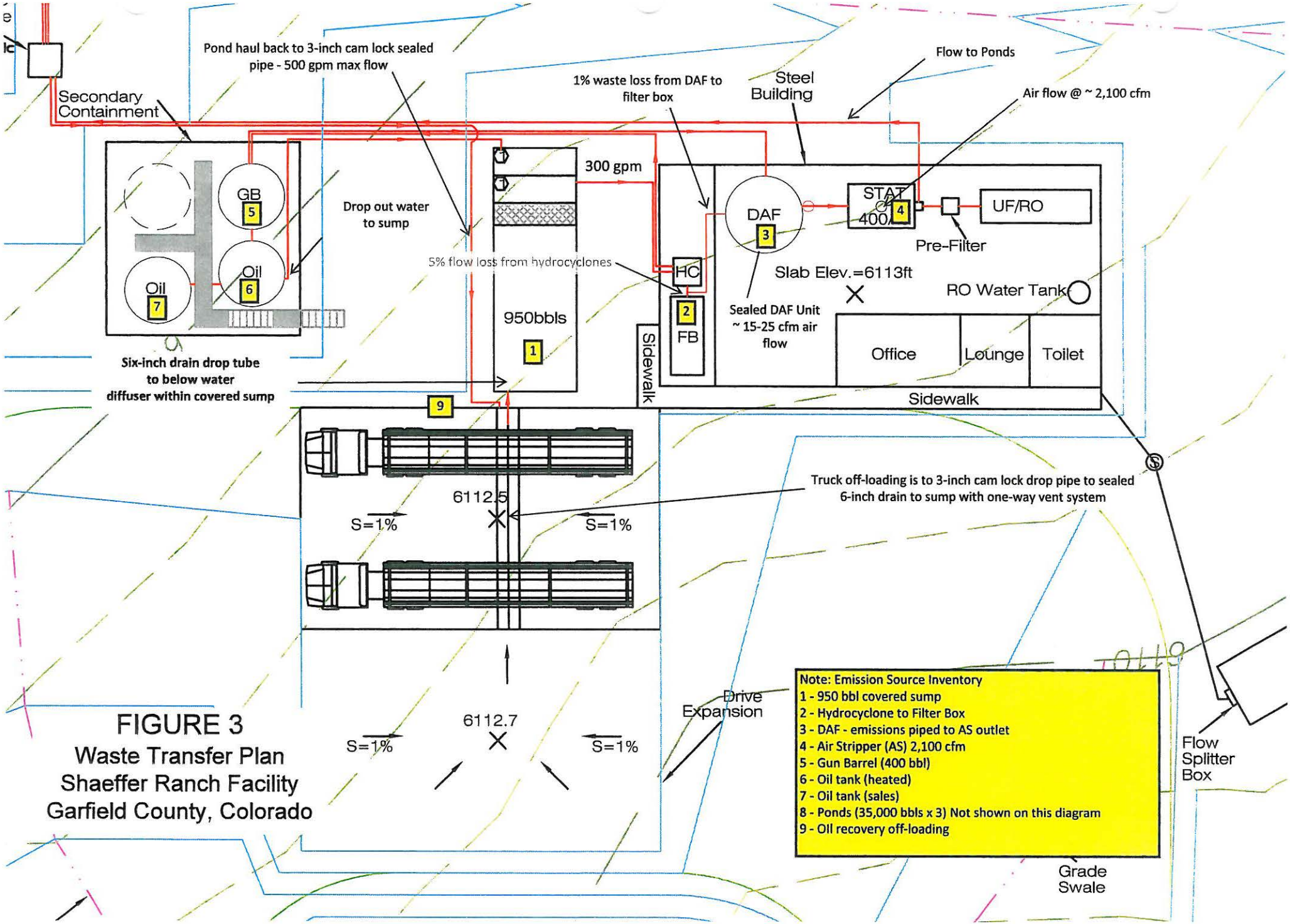


FIGURE 3

Waste Transfer Plan
Shaeffer Ranch Facility
Garfield County, Colorado

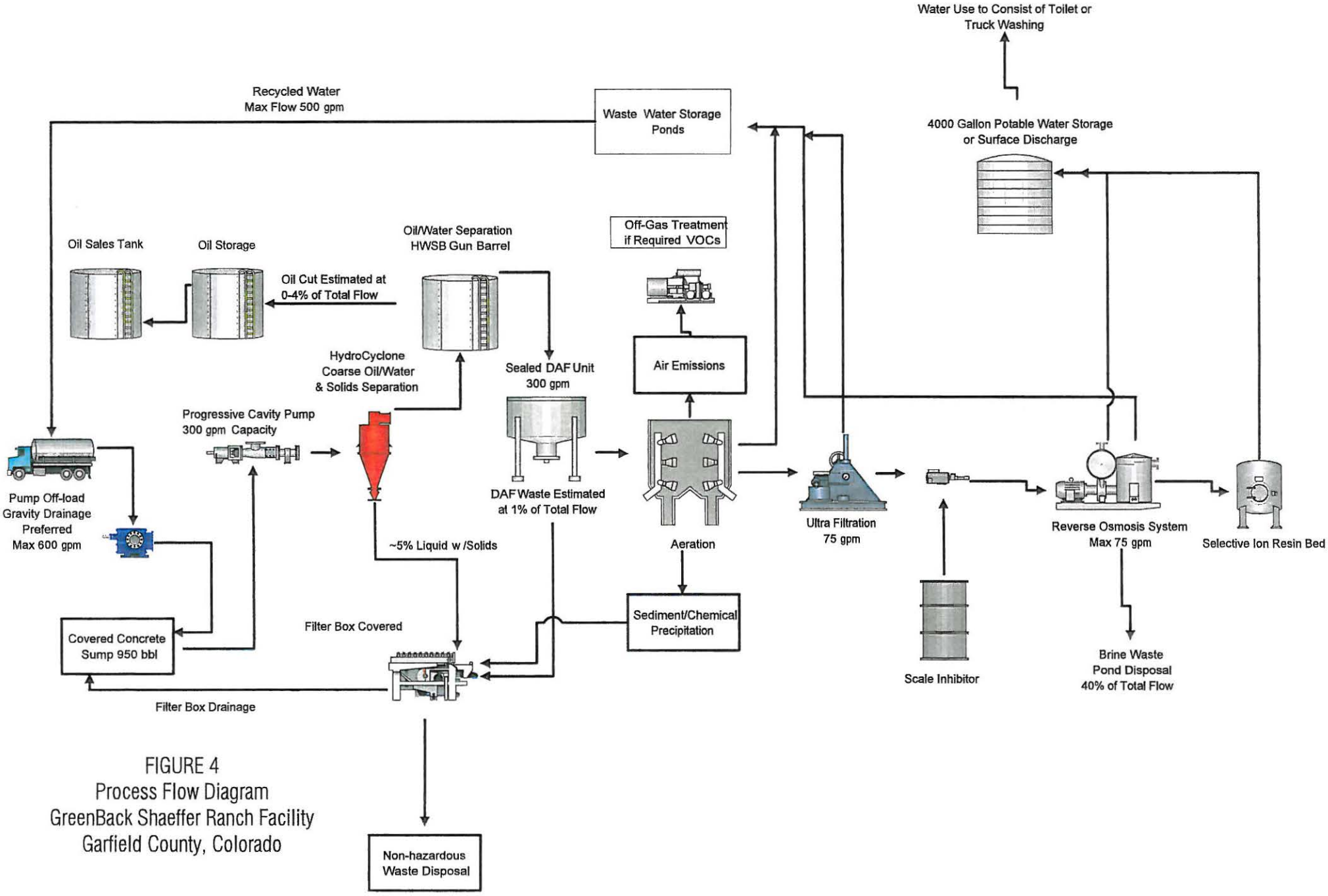


FIGURE 4
Process Flow Diagram
GreenBack Shaeffer Ranch Facility
Garfield County, Colorado

ATTACHMENT H

OPERATIONS AND MAINTENANCE PLAN – APCD FORM SERIES 300

Form APCD-304

Colorado Department of Public Health and Environment
Air Pollution Control Division

Colorado Department of Public Health and Environment

Operating and Maintenance Plan Template for Condensate and Mixed Liquid Storage Tanks

Ver. September 10, 2008

The Air Pollution Control Division (Division) developed this Operating and Maintenance Plan (O&M Plan) for condensate and mixed liquid storage tanks permitted at synthetic minor facilities in the State of Colorado. An O&M Plan shall be submitted with the permit application. One O&M Plan may be used for multiple tanks at one facility if each are controlled and monitored in the same manner. If the O&M Plan template is completed correctly, the Division will approve the O&M Plan and a construction permit will be issued with the requirement to follow the O&M Plan as submitted. If the template is not completed correctly, the Division will work with the facility to make corrections. Once a construction permit is issued, the facility operator must comply with the requirements of the O&M Plan upon commencement of operation. Operators are not required to use this template. Independent case specific O&M Plans may be developed and submitted for approval with the permit application. However, the Division encourages the use of this template to expedite the permit application approval process.

Submittal Date: March 22, 2010

Section 1 - Source Identification

For new permits some of this information (i.e. Facility AIRS ID, Facility Equipment ID, Permit Number, and AIRS Point ID) may not be known at the time of application. Please only fill out those fields that are known and leave the others blank.

Company Name: GreenBack Produced Water Recovery, LLC

Facility Location: NE, NE, S12, T7S, R93W

Facility Name: Shaeffer Ranch Facility

Facility AIRS ID (for existing facilities)

Units Covered by this O&M form

Facility Equipment ID	#1	#2	#3	#5	#6	#7
Permit Number						
AIRS Point ID						
Tank Type [a]	ML	ML	ML	ML	C	C
Controlled (Y/N)	N	N	Y	N	N	N

[a] Tank types include condensate (C) and mixed liquid (ML)

Section 2 - Maintenance Schedules

Check one of the following:

☐ Facility shall follow manufacturer recommendations for the operation and maintenance of equipment and control devices. These schedules and practices, as well as any maintenance records showing compliance with these recommendations, shall be made available to the Division upon request.

☒ Facility shall follow individually developed maintenance practices and schedules for the operation and maintenance of equipment and control devices. These schedules and practices, as well as any maintenance records showing compliance with these recommendations, shall be made available to the division upon request and should be consistent with good air pollution control practices for minimizing emissions as defined in the New Source Performance Standard (NSPS) general conditions.

Section 3 - Monthly Emission Modeling or Calculations

The following box must be checked for O&M plan to be considered complete.

☒ The source will calculate emissions based on the methods and emission factors provided in the permit application and approved by the division, as reflected in the construction permit. *Please see the operation and maintenance plan guidance document for further details and examples of emission calculations.*

Section 4 – General Monitoring Requirements

All condensate collection, storage, processing and handling operations, regardless of size, shall be designed, operated and maintained to minimize leakage of volatile organic compounds to the atmosphere to the maximum extent practicable.

Table 1 below details the schedule on which the source must monitor each of the listed operating parameters depending on the requested permitted emissions at the facility. Check the appropriate box based on the facility wide permitted VOC emissions.

Table 1		
Parameter	**Monitoring Frequency**	
	☒ **Permitted Facility Emissions = 80 tpy VOC**	☐ **Permitted Facility Emissions < 80 tpy VOC**
Condensate Throughput	Monthly	Monthly
Separator Temperature (if present)	Weekly	Monthly
Separator Pressure (if present)	Weekly	Monthly

Table 2 outlines condensate and mixed liquid throughput monitoring methods. The source must chose one primary monitoring method and, optionally, may chose up to two backup methods. Check each box that applies.

Table 2		
Primary	**Back-up**	**Condensate or Mixed Liquid Throughput Monitoring Method**
☒		**Inlet meter(s)**
☐	☒	**Tank level measurements which take into account all additions and loadout activity**
☐	☒	**Sales or haul tickets**
☐	☐	**Other (to be approved by the division)**: attach method explanation and sample calculations

Section 5 - Emission Control or Recycling Equipment Monitoring Requirements

If a control device is used then leakage of VOCs to the atmosphere must be minimized as follows:

- Thief hatch seals shall be inspected for integrity annually and replaced as necessary;
- Thief hatch covers shall be weighted and properly seated;
- Pressure relief valves (PRV) shall be inspected annually for proper operation and replaced as necessary;
- PRVs shall be set to release at a pressure that will ensure flashing, working and breathing losses (as applicable) are routed to the control device under normal operating conditions;
- Annual inspections shall be documented with an indication of status, a description of any problems found, and their resolution.

Table 3 below details the monitoring frequency for control equipment depending on the type of control equipment used and the requested permitted emissions at the facility. Check the appropriate box for "Monitoring Frequency" based on the facility-wide permitted VOC emissions. In addition, indicate storage tank emissions controls by checking the appropriate boxes.

Table 3				
Emissions Control or Recycling Method		**Parameter**	**Monitoring Frequency**	
			☒ **Permitted Facility Emissions = 80 tpy VOC**	☐ **Permitted Facility Emissions < 80 tpy VOC**
Thermal Oxidizer	☒	**Combustion Chamber Temperature** [b]	Daily	Weekly
Combustor or Flare	☐	**Pilot Light Monitoring** [c]	Daily	Weekly
		Method 22 Readings	Daily	Weekly
Recycled or Closed Loop System (Including Vapor Recovery Units)	☐	**To be determined by the source and approved by the division** [d]		
Re-routed to Reboiler Burner	☐	**To be determined by the source and approved by the division** [e]		

[b] Minimum Thermal Oxidizer Combustion Chamber Temperature

If the facility uses a thermal oxidizer to control emissions then the minimum combustion chamber temperature shall be: *Select one of the following options from Table 4:*

Table 4		
☒	1400 ° F	
☐	° F	Based on manufacturer specifications. Specifications must be submitted with the permit application and made available to the Division upon request
☐	Based on testing performed. The test data shall be submitted and attached to the O&M Plan	

[c] Pilot Light Monitoring Options

If the facility uses a Combustor or Flare then the source must indicate the method by which the presence of a pilot light will be monitored in Table 5. One primary method for Pilot Light Monitoring must be checked and, optionally, up to two backup methods may be checked.

Table 5		
Primary	**Back-up**	**Monitoring Method**
☐	☐	Visual Inspection
☐	☐	Optical Sensor
☐	☐	Auto-Igniter Signal
☐	☐	Thermocouple

[d] Recycled or Closed Loop System Monitoring Plan

In the space provided below please provide a brief description of the emission control or recycling system, including an explanation of how the system design ensures that emissions are being routed to the appropriate system at all times, or during all permitted runtime.

[e] **Reboiler Burner Control Monitoring Plan**

In the space provided below please provide a brief description of the emission control system, including an explanation of how the system design ensures that emissions are being held or rerouted when the reboiler is not firing.

Section 6 – Recordkeeping Requirements

The following box must be checked for O&M plan to be considered complete.

☒ Synthetic minor sources are required to maintain maintenance and monitoring records for the requirements listed in sections 2, 3, 4 and 5 for a period of 2 years. If an applicable Federal NSPS, NESHAP or MACT requires a longer record retention period the operator must comply with the longest record retention requirement.

Section 7 - Additional Notes and O&M Activities

Please use this section to describe any additional notes or operation and maintenance activities.

Note: These templates are intended to address operation and maintenance requirements of the State of Colorado for equipment operated at synthetic minor facilities. If the facility or equipment is subject to other state or federal regulations with duplicative requirements, the source shall follow the most stringent regulatory requirement.

ATTACHMENT I

REGULATORY ANALYSIS

(INTENTIONALLY LEFT BLANK)

ATTACHMENT J

FORM APCD-105

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