

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY
REM 10087
Document 2527653

SITE INVESTIGATION AND REMEDIATION WORKPLAN

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

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): drill cuttings

OGCC Employee:
 Spill Complaint
 Inspection NOAV
Tracking No:

OGCC Operator Number: <u>10516</u>	Contact Name and Telephone: <u>Bryan Burns</u>
Name of Operator: <u>LINN Operating, Inc.</u>	No: <u>303-999-4245</u>
Address: <u>1999 Broadway, Suite 3700</u>	Fax: <u>303-999-4345</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80202</u>	

API Number: <u>05-045-13637</u>	County: <u>Garfield</u>
Facility Name: <u>Latham O32 596</u>	Facility Number: <u>335840</u>
Well Name: <u>Latham #32-14D</u>	Well Number: <u>32-14D</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SW1/4 SE1/4 Sec 32 T5S R96W</u> Latitude: <u>39.567702</u> Longitude: <u>108.189306</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): drill cuttings

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

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): rangeland and natural gas production

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

Potential receptors (water wells within 1/4 mi, surface waters, etc.): House Log Gulch 750 feet southeast

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>drill cuttings contained within soil berm</u>	<u>laboratory testing</u>
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
Pit is currently being drained and prepared for decommissioning. Drill cuttings, liquids, the synthetic liner, and any stained soil beneath the liner will be excavated and tested for Table 910-1 parameters. These cuttings will then be stockpiled on site before landfarming begins.

Describe how source is to be removed:
Drill cuttings and all other material will be excavated from the production pit, stockpiled on the well pad, and enclosed by a soil berm. Landfarming will then commence to treat the soil and periodic discrete sampling will monitor remediation progress. When soil meets the Table 910-1 standards, it will be spread onsite and used in reclamation.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
Drill cuttings will be landfarmed on site within a bermed area. Background soil samples will also be collected and analyzed for arsenic in the vicinity of the pit to characterize natural soil arsenic concentrations.



Tracking Number: Name of Operator: OGCC Operator No: Received Date: Well Name & No: Facility Name & No:

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

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

There are no impacts to groundwater.

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

The site is currently used for water storage. After use of the water storage pit is completed, the pit will be drained, liner removed and disposed of at a certified land fill and the bird net and fence will be removed from over and around the pit. Once background levels of arsenic in the drill cuttings are demonstrated and COGCC Table 910-1 standards are met, drill cuttings will be blended with non-contaminated on-site materials and buried in the pit and compacted. The remainder of the pit will be backfilled using native rock and soil, regraded to conform to the surrounding ground surface, and reseeded using an approved seed mix. Noxious weeds will be controlled as necessary using approved methods.

If COGCC Table 910-1 standards are not met, then the spoil material taken from the pit bottom will be treated on site by land farming. The pit will be excavated until clean soil is apparent and will be tested again and will be repeated until 910-1 Standards are met. The existing spoil material that is on site will also be tested and land farmed on site if required. The treatment will include adding nitrogen and/or phosphorus amendments. The treated contaminated material meeting COGCC minimum standards will be blended with clean non-contaminated on-site materials and will be buried on location per COGCC standards. Exterior slopes on east, west, and south sides shall be pulled up and materials will be pushed into existing pit. The exterior slopes will be laid back at a minimum 3:1. Top soil will be spread over all slopes and will be reseeded with a landowner approved seed mix.

Linn Operating, Inc. has addressed and accommodated the wildlife concerns during the site stabilization of this pad.

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

Is further site investigation required? [X] Y [] N If yes, describe:

During closure of the water storage pit, samples of the pit bottom materials will be collected and analyzed for the Table 910-1 parameters to evaluate the compliance with the standards. Semi-annual sampling will be conducted until all land farming areas meet safe standards set and approved by the COGCC.

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

The remediated drill cuttings and water storage pit bottom materials will be blended with on-site materials and buried in the pit as described above.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 7/14/2014 Date Site Investigation Completed: Date Remediation Plan Submitted: Remediation Start Date: 7/14/2014 Anticipated Completion Date: 7/14/2016 Actual Completion Date:

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

Print Name: Bryan Burns Signed: [Signature] Title: Environmental, Health, and Safety Representative Date: 9/5/14

OGCC Approved: Title: Date:

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80205 Phone: (303) 894-2100 Fax: (303) 894-2109



DE	ET	OE	ES
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Document Number:

SUNDRY NOTICE

Submit a signed original. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full in Comments or provide as an attachment. Identify Well by API Number; identify Oil and Gas Location by Location ID Number; identify other Facility by Facility ID Number.

OGCC Operator Number: 10516 Contact Name Bryan Burns
 Name of Operator: LINN Operating, Inc. Phone: 803-999-4245
 Address: 1999 Broadway, Suite 3700 Fax: 803-999-4345
 City: Denver State: CO Zip: 80202 Email: bburns@linnenergy.com

Complete the Attachment
Checklist

OP OGCC

API Number : 05- 045-13637 OGCC Facility ID Number: 335840
 Well/Facility Name: Latham O32 696 Well/Facility Number: Latham #32-14D
 Location QtrQtr: SW 1/4 SE 1/4 Section: Sec32 Township: T5S Range: R96W Meridian: _____
 County: Garfield Field Name: Garden Gulch
 Federal, Indian or State Lease Number: _____

Survey Plat		
Directional Survey		
Srfc Eqpmt Diagram		
Technical Info Page		
Other		

CHANGE OF LOCATION OR AS BUILT GPS REPORT

Change of Location * As-Built GPS Location Report As-Built GPS Location Report with Survey

* Well location change requires new plat. A substantive surface location change may require new Form 2A.

SURFACE LOCATION GPS DATA Data must be provided for Change of Surface Location and As Built Reports.

Latitude _____ PDOP Reading _____ Date of Measurement _____
 Longitude _____ GPS Instrument Operator's Name _____

LOCATION CHANGE (all measurements in Feet)

Well will be: _____ (Vertical, Directional, Horizontal)

Change of **Surface Footage From** Exterior Section Lines:

FNL/FSL		FEL/FWL	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Change of **Surface Footage To** Exterior Section Lines:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Current **Surface Location From** QtrQtr Sec

Twp Range Meridian

New **Surface Location To** QtrQtr Sec

Twp Range Meridian

Change of **Top of Productive Zone Footage From** Exterior Section Lines:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Change of **Top of Productive Zone Footage To** Exterior Section Lines:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Current **Top of Productive Zone Location From** Sec

Twp Range

New **Top of Productive Zone Location To** Sec

Twp Range

Change of **Bottomhole Footage From** Exterior Section Lines:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Change of **Bottomhole Footage To** Exterior Section Lines:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Current **Bottomhole Location** Sec Twp Range

** attach deviated drilling plan

New **Bottomhole Location** Sec Twp Range

Is location in High Density Area? _____

Distance, in feet, to nearest building _____, public road: _____, above ground utility: _____, railroad: _____,

property line: _____, lease line: _____, well in same formation: _____

Ground Elevation _____ feet Surface owner consultation date _____

CHANGE OR ADD OBJECTIVE FORMATION AND/OR SPACING UNIT

<u>Objective Formation</u>	<u>Formation Code</u>	<u>Spacing Order Number</u>	<u>Unit Acreage</u>	<u>Unit Configuration</u>

OTHER CHANGES

REMOVE FROM SURFACE BOND Signed surface use agreement is a required attachment

CHANGE OF WELL, FACILITY OR OIL & GAS LOCATION NAME OR NUMBER

From: Name _____ Number _____ Effective Date: _____

To: Name _____ Number _____

ABANDON PERMIT: Permit can only be abandoned if the permitted operation has NOT been conducted. Field inspection will be conducted to verify site status.

WELL: Abandon Application for Permit-to-Drill (Form2) – Well API Number _____ has not been drilled.

PIT: Abandon Earthen Pit Permit (Form 15) – COGCC Pit Facility ID Number _____ has not been constructed (Permitted and constructed pit requires closure per Rule 905)

CENTRALIZED E&P WASTE MANAGEMENT FACILITY: Abandon Centralized E&P Waste Management Facility Permit (Form 28) – Facility ID Number _____ has not been constructed (Constructed facility requires closure per Rule 908)

OIL & GAS LOCATION ID Number: _____

Abandon Oil & Gas Location Assessment (Form 2A) – Location has not been constructed and site will not be used in the future.

Keep Oil & Gas Location Assessment (Form 2A) active until expiration date. This site will be used in the future.

Surface disturbance from Oil and Gas Operations must be reclaimed per Rule 1003 and Rule 1004.

REQUEST FOR CONFIDENTIAL STATUS

DIGITAL WELL LOG UPLOAD

DOCUMENTS SUBMITTED Purpose of Submission: _____

RECLAMATION

INTERIM RECLAMATION

Interim Reclamation will commence approximately _____

Interim reclamation complete, site ready for inspection. Per Rule 1003.e.(3) operator shall submit Sundry Notice reporting interim reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage. Describe interim reclamation procedure in Comments below or provide as an attachment and attach required location photographs. **Field inspection will be conducted to document Rule 1003.e. compliance**

FINAL RECLAMATION

Final Reclamation will commence approximately _____

Final reclamation complete, site ready for inspection. Per Rule 1004.c.(4) operator shall submit Sundry Notice reporting final reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage. Describe final reclamation procedure in Comments below or provide as an attachment. **Field inspection will be conducted to document Rule 1004.c. compliance**

Comments:

ENGINEERING AND ENVIRONMENTAL WORK

NOTICE OF CONTINUED TEMPORARILY ABANDONED STATUS

Indicate why the well is temporarily abandoned and describe future plans for utilization in the COMMENTS box below or provide as an attachment, as required by Rule 319.b.(3).

Date well temporarily abandoned _____ Has Production Equipment been removed from site? _____

Mechanical Integrity Test (MIT) required if shut in longer than 2 years. Date of last MIT _____

SPUD DATE: _____

TECHNICAL ENGINEERING AND ENVIRONMENTAL WORK

Details of work must be described in full in the COMMENTS below or provided as an attachment.

NOTICE OF INTENT Approximate Start Date _____

REPORT OF WORK DONE Date Work Completed _____

<input type="checkbox"/> Intent to Recomplete (Form 2 also required)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Mangement Plan
<input type="checkbox"/> Change Drilling Plan	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Change	<input type="checkbox"/> Rule 502 variance requested. Must provide detailed info regarding request.	
<input checked="" type="checkbox"/> Other <u>Background arsenic values</u>	<input type="checkbox"/> Status Update/Change of Remediation Plans for Spills and Releases	

COMMENTS:

The operator requests a vavance from the Table 910-1 standard for arsenic in soil based on the following:

The composite sample collected from the stockpiled cuttings had an arsenic concentration of 5.6 mg/kg. Three background grab samples were collected from undisturbed areas near the O-32 well pad on August 13, 2011 and had arsenic concentrations of 7.2 mg/kg, 6.5 mg/kg, and 7.8 mg/kg (see attached map). Based on these results and the methodology recommended by the COGCC staff for establishing background arsenic levels, the allowable concentration of arsenic in soil at this site is 8.6 mg/kg (maximum plus 10%).

Since the arsenic concentrations in the remediated cuttings pile are below the allowable background level, the operator proposes to bury this material in the reserve pit and proceed with interim reclamation of this site.

CASING AND CEMENTING CHANGES

Casing Type	Size	Of	/	Hole	Size	Of	/	Casing	W/Ft	Csg/LinTop	Setting Depth	Sacks of Cement	Cement Bottom	Cement Top

H2S REPORTING

Data Fields in this section are intended to document Sample and Location Data associated with the collection of a Gas Sample that is submitted for Laboratory Analysis.

Gas Analysis Report must be attached.

H2S Concentration: _____ in ppm (parts per million) Date of Measurement or Sample Collection _____

Description of Sample Point:

Absolute Open Flow Potential _____ in CFPD (cubic feet per day)

Description of Release Potential and Duration (If flow is not open to the atmosphere, identify the duration in which the container or pipeline would likely be opened for servicing operations.):

Distance to nearest occupied residence, school, church, park, school bus stop, place of business, or other areas where the public could reasonably be expected to frequent: _____

Distance to nearest Federal, State, County, or municipal road or highway owned and principally maintained for public use: _____

COMMENTS:

BMP

<u>Type</u>	<u>Comment</u>

GROUND WATER SAMPLING

Uses of Ground Water Sampling Section

Request an Exception to Ground Water Sampling Requirements in Greater Wattenberg Area Rule 318A.e(4) or in Statewide Rule 609.c. Request a Previously Sampled Water Source in the COGIS database be used to meet sampling requirements as described in Rule 609.d.(3).

NOTE: If this Sundry Notice is being submitted to request a Ground Water Sampling Exception it cannot be used for any other purpose except requesting the use of a Previously Sampled Water Source in the COGIS database.

Request an Exception to Ground Water Sampling Requirements per Greater Wattenberg Area Rule 318A.e(4): There are no Available Water Sources located within the governmental quarter section or within a previously unsampled governmental quarter section within a 1/2-mile radius of this proposed Oil and Gas Well, Multi-Well Site, or Dedicated Injection Well.

Request an Exception to Ground Water Sampling Requirements per Statewide Rule 609.c.

_____ Number of Water Sources located within one-half (1/2) mile of a proposed Oil and Gas Well, Multi-Well Site, or Dedicated Injection Well.

_____ Number of Water Source Exceptions requested per Rule 609.c.

_____ Number of Water Sources determined to be unsuitable. **The condition of these Water Sources MUST be documented in the comments below or in an attachment.**

_____ Number of Water Sources suitable for testing whose owners refused to grant access despite an operator's reasonable good faith efforts to obtain consent to conduct sampling. **The reasonable good faith efforts used to obtain access from the owners of these Water Sources MUST be documented in the comments below or in an attachment.**

Request a Previously Sampled Water Source in the COGIS database be used to meet sampling requirements as described in Rule 609.d(3)

_____ Type of Sample Substitution Request

Enter Sample ID Number from COGIS Maps for each Previous Water Sample:

Sample ID	Facility ID	Sample Date	Sample Purpose

COMMENTS

Operator Comments:

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

Signed:  Print Name: Bryan Burns
 Title: Environmental, Health, and Safety Representative Email: bburns@linenergy.com Date: 9/15/14

Based on the information provided herein, this Sundry Notice (Form 4) complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: _____ Date: _____

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Thursday August 18, 2011

Report Number: L531307

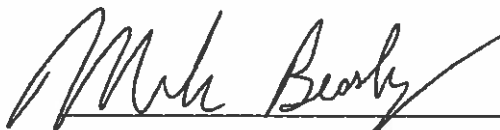
Samples Received: 08/16/11

Client Project:

Description: Berry Pit Reclamation

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:



Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

This report may not be reproduced, except in full, without written approval from ESC Lab Sciences. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

YOUR LAB OF CHOICE

REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

August 18, 2011

Date Received : August 16, 2011
Description : Berry Pit Reclamation
Sample ID : 032-1 6-10IN
Collected By :
Collection Date : 08/13/11 09:55

ESC Sample # : L531307-10

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	7.2	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/18/11 11:10 Printed: 08/18/11 11:10



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

August 18, 2011

Date Received : August 16, 2011
Description : Berry Pit Reclamation
Sample ID : 032-2 0-4IN
Collected By :
Collection Date : 08/13/11 10:00

ESC Sample # : L531307-11

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	6.5	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

August 18, 2011

Date Received : August 16, 2011
Description : Berry Pit Reclamation
Sample ID : 032-3 12-16IN
Collected By :
Collection Date : 08/13/11 10:05

ESC Sample # : L531307-12

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic	7.8	1.0	mg/kg	6010B	08/18/11	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 08/18/11 11:10 Printed: 08/18/11 11:10



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YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Quality Assurance Report
Level II

Denver, CO 80202

L531307

August 18, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Arsenic	< 1	mg/kg			WG550835	08/17/11 22:40
Arsenic	< 1	mg/kg			WG550843	08/17/11 20:19
Arsenic	< 1	mg/kg			WG550738	08/17/11 23:07

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate	RPD				
Arsenic	mg/kg	9.70	11.0	12.4	20	L531307-25	WG550835	
Arsenic	mg/kg	25.0	24.0	3.28	20	L531307-39	WG550843	
Arsenic	mg/kg	3.30	3.90	15.8	20	L531273-04	WG550738	

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Arsenic	mg/kg	192	188.	97.9	78.6-120.8	WG550835
Arsenic	mg/kg	92.6	93.6	101.	82.9-117	WG550843
Arsenic	mg/kg	192	202.	105.	78.6-120.8	WG550738

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Arsenic	mg/kg	51.6	11.0	50	81.2	75-125	L531307-25	WG550835
Arsenic	mg/kg	84.0	24.0	10	120.	75-125	L531307-39	WG550843
Arsenic	mg/kg	52.8	3.90	50	97.8	75-125	L531273-04	WG550738

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Arsenic	mg/kg	49.2	51.6	76.4	75-125	4.76	20	L531307-25	WG550835
Arsenic	mg/kg	79.2	84.0	110.	75-125	5.88	20	L531307-39	WG550843
Arsenic	mg/kg	51.2	52.8	94.6	75-125	3.08	20	L531273-04	WG550738

Batch number /Run number / Sample number cross reference

WG550835: R1818292: L531307-07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

WG550843: R1818293: L531307-26 27 28 29 30 31 32 33 34 35 36 37 38 39

WG550738: R1818474: L531307-01 02 03 04 05 06

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L531307

12065 Lebanon Rd.
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Est. 1970

August 18, 2011

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Tuesday July 19, 2011

Report Number: L525693

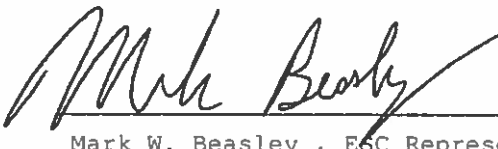
Samples Received: 07/13/11

Client Project:

Description: Berry Pit Permitting

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:



Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Tuesday July 19, 2011

Report Number: L525693

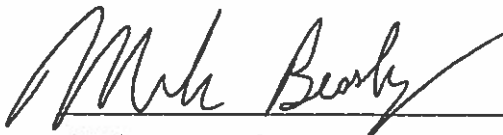
Samples Received: 07/13/11

Client Project:

Description: Berry Pit Permitting

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:



Mark W. Beasley, ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915

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REPORT OF ANALYSIS

July 19, 2011

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

Date Received : July 13, 2011
Description : Berry Pit Permitting
Sample ID : O-32 PILE 6-12 IN
Collected By : DK Nicholson
Collection Date : 07/11/11 15:40

ESC Sample # : L525693-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium,Hexavalent	BDL	2.0	mg/kg	3060A/7196A	07/18/11	1
ORP	120		mV	2580	07/14/11	1
pH	7.7		su	9045D	07/15/11	1
Sodium Adsorption Ratio	4.7			Calc.	07/15/11	1
Specific Conductance	430		umhos/cm	9050AMod	07/19/11	1
Mercury	0.037	0.020	mg/kg	7471	07/15/11	1
Arsenic	5.1	1.0	mg/kg	6010B	07/15/11	1
Barium	400	0.25	mg/kg	6010B	07/15/11	1
Boron	BDL	10.	mg/kg	6010B	07/15/11	1
Cadmium	BDL	0.25	mg/kg	6010B	07/15/11	1
Chromium	24.	0.50	mg/kg	6010B	07/15/11	1
Copper	22.	1.0	mg/kg	6010B	07/15/11	1
Lead	15.	0.25	mg/kg	6010B	07/15/11	1
Nickel	16.	1.0	mg/kg	6010B	07/15/11	1
Selenium	BDL	1.0	mg/kg	6010B	07/15/11	1
Silver	BDL	0.50	mg/kg	6010B	07/15/11	1
Zinc	53.	1.5	mg/kg	6010B	07/15/11	1
Benzene	BDL	0.0025	mg/kg	8021/8015	07/14/11	5
Toluene	BDL	0.025	mg/kg	8021/8015	07/14/11	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	07/14/11	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	07/14/11	5
TPH (GC/FID) Low Fraction	0.64	0.50	mg/kg	GRO	07/14/11	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.4		% Rec.	8021/8015	07/14/11	5
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	07/14/11	5
TPH (GC/FID) High Fraction	250	4.0	mg/kg	3546/DRO	07/14/11	1
Surrogate recovery(%)						
o-Terphenyl	54.0		% Rec.	3546/DRO	07/14/11	1
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Acenaphthene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Acenaphthylene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Benzo(a)anthracene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Benzo(a)pyrene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Benzo(b)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
L525693-02 (PH) - 7.7@22.0c
L525693-02 (CR6) - sample is a reducer according to Orp/pH



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REPORT OF ANALYSIS

July 19, 2011

Dave Nicholson
 Berry Petroleum Company - Denver, C
 1999 Broadway, Suite 3700
 Denver, CO 80202

Date Received : July 13, 2011
 Description : Berry Pit Permitting
 Sample ID : O-32 PILE 6-12 IN
 Collected By : DK Nicholson
 Collection Date : 07/11/11 15:40

ESC Sample # : L525693-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo(g,h,i)perylene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Benzo(k)fluoranthene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Chrysene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Dibenz(a,h)anthracene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Fluoranthene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Fluorene	0.041	0.030	mg/kg	8270C-SIM	07/15/11	5
Indeno(1,2,3-cd)pyrene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Naphthalene	0.057	0.030	mg/kg	8270C-SIM	07/15/11	5
Phenanthrene	0.056	0.030	mg/kg	8270C-SIM	07/15/11	5
Pyrene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
1-Methylnaphthalene	0.050	0.030	mg/kg	8270C-SIM	07/15/11	5
2-Methylnaphthalene	0.096	0.030	mg/kg	8270C-SIM	07/15/11	5
2-Chloronaphthalene	BDL	0.030	mg/kg	8270C-SIM	07/15/11	5
Surrogate Recovery						
Nitrobenzene-d5	140.		§ Rec.	8270C-SIM	07/15/11	5
2-Fluorobiphenyl	77.2		§ Rec.	8270C-SIM	07/15/11	5
p-Terphenyl-d14	102.		§ Rec.	8270C-SIM	07/15/11	5

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 07/19/11 17:12 Printed: 07/19/11 17:13

L525693-02 (PH) - 7.7@22.0c

L525693-02 (CR6) - sample is a reducer according to Orp/pH

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L525693-01	WG545418	SAMP	Nitrobenzene-d5	R1763514	J7
	WG545418	SAMP	2-Fluorobiphenyl	R1763514	J7
	WG545418	SAMP	p-Terphenyl-d14	R1763514	J7
	WG545307	SAMP	o-Terphenyl	R1761530	J7
L525693-02	WG545418	SAMP	Nitrobenzene-d5	R1763514	J1
	WG545898	SAMP	Chromium, Hexavalent	R1768530	J6J3
L525693-03	WG545418	SAMP	Nitrobenzene-d5	R1763514	J1
	WG545418	SAMP	p-Terphenyl-d14	R1763514	J1
	WG545307	SAMP	o-Terphenyl	R1761530	J7

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy** - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision** - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate** - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC** - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
07/19/11 at 17:13:21

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L525693-01 Account: BERPETDCO Received: 07/13/11 09:00 Due Date: 07/20/11 00:00 RPT Date: 07/19/11 17:12

Sample: L525693-02 Account: BERPETDCO Received: 07/13/11 09:00 Due Date: 07/20/11 00:00 RPT Date: 07/19/11 17:12

Sample: L525693-03 Account: BERPETDCO Received: 07/13/11 09:00 Due Date: 07/20/11 00:00 RPT Date: 07/19/11 17:12



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Denver, CO 80202

L525693

July 19, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
TPH (GC/FID) High Fraction	< 4	ppm			WG545307	07/13/11 23:04
o-Terphenyl		% Rec.	75.51	50-150	WG545307	07/13/11 23:04
1-Methylnaphthalene	< .006	mg/kg			WG545418	07/14/11 11:27
2-Chloronaphthalene	< .006	mg/kg			WG545418	07/14/11 11:27
2-Methylnaphthalene	< .006	mg/kg			WG545418	07/14/11 11:27
Acenaphthene	< .006	mg/kg			WG545418	07/14/11 11:27
Acenaphthylene	< .006	mg/kg			WG545418	07/14/11 11:27
Anthracene	< .006	mg/kg			WG545418	07/14/11 11:27
Benzo(a)anthracene	< .006	mg/kg			WG545418	07/14/11 11:27
Benzo(a)pyrene	< .006	mg/kg			WG545418	07/14/11 11:27
Benzo(b)fluoranthene	< .006	mg/kg			WG545418	07/14/11 11:27
Benzo(g,h,i)perylene	< .006	mg/kg			WG545418	07/14/11 11:27
Benzo(k)fluoranthene	< .006	mg/kg			WG545418	07/14/11 11:27
Chrysene	< .006	mg/kg			WG545418	07/14/11 11:27
Dibenz(a,h)anthracene	< .006	mg/kg			WG545418	07/14/11 11:27
Fluoranthene	< .006	mg/kg			WG545418	07/14/11 11:27
Fluorene	< .006	mg/kg			WG545418	07/14/11 11:27
Indeno(1,2,3-cd)pyrene	< .006	mg/kg			WG545418	07/14/11 11:27
Naphthalene	< .006	mg/kg			WG545418	07/14/11 11:27
Phenanthrene	< .006	mg/kg			WG545418	07/14/11 11:27
Pyrene	< .006	mg/kg			WG545418	07/14/11 11:27
2-Fluorobiphenyl		% Rec.	84.21	21-120	WG545418	07/14/11 11:27
Nitrobenzene-d5		% Rec.	85.21	33-114	WG545418	07/14/11 11:27
p-Terphenyl-d14		% Rec.	88.69	18-142	WG545418	07/14/11 11:27
Mercury	< .02	mg/kg			WG545483	07/15/11 08:56
pH	4.40	su			WG545683	07/15/11 15:08
Benzene	< .0005	mg/kg			WG545805	07/15/11 16:32
Ethylbenzene	< .0005	mg/kg			WG545805	07/15/11 16:32
Toluene	< .005	mg/kg			WG545805	07/15/11 16:32
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG545805	07/15/11 16:32
Total Xylene	< .0015	mg/kg			WG545805	07/15/11 16:32
a,a,a-Trifluorotoluene(FID)		% Rec.	96.15	59-128	WG545805	07/15/11 16:32
a,a,a-Trifluorotoluene(PID)		% Rec.	99.83	54-144	WG545805	07/15/11 16:32
Arsenic	< 1	mg/kg			WG545451	07/15/11 16:16
Barium	< .25	mg/kg			WG545451	07/15/11 16:16
Boron	< 10	mg/kg			WG545451	07/15/11 16:16
Cadmium	< .25	mg/kg			WG545451	07/15/11 16:16
Chromium	< .5	mg/kg			WG545451	07/15/11 16:16
Copper	< 1	mg/kg			WG545451	07/15/11 16:16
Lead	< .25	mg/kg			WG545451	07/15/11 16:16
Nickel	< 1	mg/kg			WG545451	07/15/11 16:16
Selenium	< 1	mg/kg			WG545451	07/15/11 16:16
Silver	< .5	mg/kg			WG545451	07/15/11 16:16
Zinc	< 1.5	mg/kg			WG545451	07/15/11 16:16
Chromium, Hexavalent	< 2	mg/kg			WG545898	07/18/11 14:42

* Performance of this Analyte is outside of established criteria.
 For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Denver, CO 80202

L525693

July 19, 2011

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/kg			WG545480	07/14/11 01:23
Ethylbenzene	< .0005	mg/kg			WG545480	07/14/11 01:23
Toluene	< .005	mg/kg			WG545480	07/14/11 01:23
TPH (GC/FID) Low Fraction	< .1	mg/kg			WG545480	07/14/11 01:23
Total Xylene	< .0015	mg/kg			WG545480	07/14/11 01:23
a,a,a-Trifluorotoluene (FID)		% Rec.	98.43	59-128	WG545480	07/14/11 01:23
a,a,a-Trifluorotoluene (PID)		% Rec.	101.2	54-144	WG545480	07/14/11 01:23
Specific Conductance	0.970	umhos/cm			WG545954	07/19/11 16:17

Analyte	Units	Duplicate			Limit	Ref Samp	Batch
		Result	Duplicate	RPD			
ORP	mV	130.	130.	3.03	20	L525429-04	WG545424
Mercury	mg/kg	0	0	0	20	L525741-01	WG545483
pH	su	12.0	12.0	0	1	L525565-01	WG545683
pH	su	9.20	9.20	0	1	L525947-01	WG545683
Arsenic	mg/kg	1.20	1.30	5.53	20	L525660-02	WG545451
Barium	mg/kg	110.	108.	1.83	20	L525660-02	WG545451
Boron	mg/kg	0	2.44	NA	20	L525660-02	WG545451
Cadmium	mg/kg	0	0	0	20	L525660-02	WG545451
Chromium	mg/kg	13.0	11.0	17.4	20	L525660-02	WG545451
Copper	mg/kg	16.0	15.0	8.31	20	L525660-02	WG545451
Lead	mg/kg	20.0	18.0	12.5	20	L525660-02	WG545451
Nickel	mg/kg	12.0	12.0	3.28	20	L525660-02	WG545451
Selenium	mg/kg	0	0	0	20	L525660-02	WG545451
Silver	mg/kg	0	0.426	NA	20	L525660-02	WG545451
Zinc	mg/kg	55.0	54.0	1.47	20	L525660-02	WG545451
Chromium, Hexavalent	mg/kg	0	0	0	20	L526014-01	WG545898
Chromium, Hexavalent	mg/kg	0	0	0	20	L525661-01	WG545898
Specific Conductance	umhos/cm	340.	340.	0.295	20	L525429-01	WG545954
Specific Conductance	umhos/cm	980.	1000	1.71	20	L526192-01	WG545954

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
TPH (GC/FID) High Fraction	ppm	60	52.8	88.0	50-150	WG545307
o-Terphenyl				73.63	50-150	WG545307
ORP	mV	229	220.	96.1	95.6-104.37	WG545424
1-Methylnaphthalene	mg/kg	.033	0.0270	81.8	41-110	WG545418
2-Chloronaphthalene	mg/kg	.033	0.0263	79.8	43-109	WG545418
2-Methylnaphthalene	mg/kg	.033	0.0269	81.4	38-104	WG545418
Acenaphthene	mg/kg	.033	0.0269	81.6	48-103	WG545418
Acenaphthylene	mg/kg	.033	0.0277	83.9	43-106	WG545418

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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L525693

July 19, 2011

Analyte	Units	Laboratory Control Known Val	Sample Result	% Rec	Limit	Batch
Anthracene	mg/kg	.033	0.0292	88.3	51-110	WG545418
Benzo(a)anthracene	mg/kg	.033	0.0314	95.1	38-126	WG545418
Benzo(a)pyrene	mg/kg	.033	0.0309	93.5	47-118	WG545418
Benzo(b)fluoranthene	mg/kg	.033	0.0296	89.7	47-118	WG545418
Benzo(g,h,i)perylene	mg/kg	.033	0.0344	104.	40-125	WG545418
Benzo(k)fluoranthene	mg/kg	.033	0.0330	100.	45-121	WG545418
Chrysene	mg/kg	.033	0.0303	91.8	35-135	WG545418
Dibenz(a,h)anthracene	mg/kg	.033	0.0319	96.5	41-124	WG545418
Fluoranthene	mg/kg	.033	0.0309	93.7	50-114	WG545418
Fluorene	mg/kg	.033	0.0275	83.4	49-109	WG545418
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.0331	100.	40-126	WG545418
Naphthalene	mg/kg	.033	0.0260	78.6	36-100	WG545418
Phenanthrene	mg/kg	.033	0.0277	84.1	46-108	WG545418
Pyrene	mg/kg	.033	0.0280	84.9	30-136	WG545418
2-Fluorobiphenyl				84.91	33-114	WG545418
Nitrobenzene-d5				82.87	21-120	WG545418
p-Terphenyl-d14				85.52	18-142	WG545418
Mercury	mg/kg	8.77	6.62	75.5	71.6-127.7	WG545483
pH	su	6.3	6.30	100.	97.98-102.02	WG545683
Benzene	mg/kg	.05	0.0432	86.3	76-113	WG545805
Ethylbenzene	mg/kg	.05	0.0465	93.0	78-115	WG545805
Toluene	mg/kg	.05	0.0458	91.6	76-114	WG545805
Total Xylene	mg/kg	.15	0.141	93.8	81-118	WG545805
a,a,a-Trifluorotoluene(FID)				96.82	59-128	WG545805
a,a,a-Trifluorotoluene(PID)				99.35	54-144	WG545805
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.26	95.6	67-135	WG545805
a,a,a-Trifluorotoluene(FID)				102.0	59-128	WG545805
a,a,a-Trifluorotoluene(PID)				107.7	54-144	WG545805
Arsenic	mg/kg	192	161.	83.9	78.6-120.8	WG545451
Barium	mg/kg	420	381.	90.7	78.8-121.4	WG545451
Boron	mg/kg	140	125.	89.3	74.3-125.7	WG545451
Cadmium	mg/kg	70.1	58.4	83.3	78.5-121.5	WG545451
Chromium	mg/kg	168	150.	89.3	80.4-120.2	WG545451
Copper	mg/kg	122	114.	93.4	81.6-119.7	WG545451
Lead	mg/kg	113	99.6	88.1	77.3-122.1	WG545451
Nickel	mg/kg	74.1	68.2	92.0	78.8-121.2	WG545451
Selenium	mg/kg	176	154.	87.5	75.6-125.0	WG545451
Silver	mg/kg	115	97.6	84.9	66-133.9	WG545451
Zinc	mg/kg	437	376.	86.0	78.5-121.7	WG545451
Chromium, Hexavalent	mg/kg	132	97.4	73.8	50-150	WG545898
Benzene	mg/kg	.05	0.0562	112.	76-113	WG545480
Ethylbenzene	mg/kg	.05	0.0551	110.	78-115	WG545480
Toluene	mg/kg	.05	0.0540	108.	76-114	WG545480
Total Xylene	mg/kg	.15	0.159	106.	81-118	WG545480
a,a,a-Trifluorotoluene(PID)				99.45	54-144	WG545480
TPH (GC/FID) Low Fraction	mg/kg	5.5	5.83	106.	67-135	WG545480
a,a,a-Trifluorotoluene(FID)				110.8	59-128	WG545480

* Performance of this Analyte is outside of established criteria.

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Quality Assurance Report
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Denver, CO 80202

L525693

July 19, 2011

Analyte	Units	Laboratory Known Val	Control Sample Result	% Rec	Limit	Batch			
Specific Conductance	umhos/cm	445	450.	101.	85-115	WG545954			
Analyte	Units	Laboratory Result	Control Ref	Sample %Rec	Duplicate	Limit	RPD	Limit	Batch
TPH (GC/FID) High Fraction	ppm	52.6	52.8	88.0	88.0	50-150	0.390	20	WG545307
o-Terphenyl				71.43	71.43	50-150			WG545307
ORP	mV	220.	220.	96.0	96.0	95.6-104.37	0	20	WG545424
1-Methylnaphthalene	mg/kg	0.0276	0.0270	84.0	84.0	41-110	2.11	24	WG545418
2-Chloronaphthalene	mg/kg	0.0282	0.0263	85.0	85.0	43-109	6.68	21	WG545418
2-Methylnaphthalene	mg/kg	0.0279	0.0269	84.0	84.0	38-104	3.80	24	WG545418
Acenaphthene	mg/kg	0.0289	0.0269	88.0	88.0	48-103	7.10	20	WG545418
Acenaphthylene	mg/kg	0.0281	0.0277	85.0	85.0	43-106	1.30	20	WG545418
Anthracene	mg/kg	0.0273	0.0292	83.0	83.0	51-110	6.57	22	WG545418
Benzo(a)anthracene	mg/kg	0.0313	0.0314	95.0	95.0	38-126	0.209	20	WG545418
Benzo(a)pyrene	mg/kg	0.0308	0.0309	93.0	93.0	47-118	0.0660	20	WG545418
Benzo(b)fluoranthene	mg/kg	0.0328	0.0296	100.	100.	47-118	10.4	29	WG545418
Benzo(g,h,i)perylene	mg/kg	0.0392	0.0344	119.	119.	40-125	13.0	20	WG545418
Benzo(k)fluoranthene	mg/kg	0.0313	0.0330	95.0	95.0	45-121	5.42	31	WG545418
Chrysene	mg/kg	0.0295	0.0303	89.0	89.0	35-135	2.59	20	WG545418
Dibenz(a,h)anthracene	mg/kg	0.0379	0.0319	115.	115.	41-124	17.2	20	WG545418
Fluoranthene	mg/kg	0.0290	0.0309	88.0	88.0	50-114	6.23	20	WG545418
Fluorene	mg/kg	0.0301	0.0275	91.0	91.0	49-109	8.91	19	WG545418
Indeno(1,2,3-cd)pyrene	mg/kg	0.0374	0.0331	113.	113.	40-126	12.4	20	WG545418
Naphthalene	mg/kg	0.0264	0.0260	80.0	80.0	36-100	1.54	24	WG545418
Phenanthrene	mg/kg	0.0266	0.0277	80.0	80.0	46-108	4.33	21	WG545418
Pyrene	mg/kg	0.0297	0.0280	90.0	90.0	30-136	5.94	20	WG545418
2-Fluorobiphenyl				87.38	87.38	33-114			WG545418
Nitrobenzene-d5				86.15	86.15	21-120			WG545418
p-Terphenyl-d14				94.78	94.78	18-142			WG545418
pH	su	6.30	6.30	100.	100.	97.98-102.02	0	20	WG545683
Benzene	mg/kg	0.0415	0.0432	83.0	83.0	76-113	3.88	20	WG545805
Ethylbenzene	mg/kg	0.0440	0.0465	88.0	88.0	78-115	5.46	20	WG545805
Toluene	mg/kg	0.0431	0.0458	86.0	86.0	76-114	6.17	20	WG545805
Total Xylene	mg/kg	0.132	0.141	88.0	88.0	81-118	6.25	20	WG545805
a,a,a-Trifluorotoluene(FID)				96.63	96.63	59-128			WG545805
a,a,a-Trifluorotoluene(PID)				99.50	99.50	54-144			WG545805
TPH (GC/FID) Low Fraction	mg/kg	5.11	5.26	93.0	93.0	67-135	2.85	20	WG545805
a,a,a-Trifluorotoluene(FID)				101.7	101.7	59-128			WG545805
a,a,a-Trifluorotoluene(PID)				107.2	107.2	54-144			WG545805
Chromium, Hexavalent	mg/kg	114.	97.4	86.0	86.0	50-150	15.7	20	WG545898
Benzene	mg/kg	0.0511	0.0562	102.	102.	76-113	9.48	20	WG545480
Ethylbenzene	mg/kg	0.0496	0.0551	99.0	99.0	78-115	10.5	20	WG545480
Toluene	mg/kg	0.0480	0.0540	96.0	96.0	76-114	11.7	20	WG545480
Total Xylene	mg/kg	0.141	0.159	94.0	94.0	81-118	12.2	20	WG545480
a,a,a-Trifluorotoluene(PID)				100.4	100.4	54-144			WG545480
TPH (GC/FID) Low Fraction	mg/kg	6.07	5.83	110.	110.	67-135	3.87	20	WG545480

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Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
a,a,a-Trifluorotoluene (FID)				111.6		59-128		
Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
TPH (GC/FID) High Fraction	ppm	341.	220.	60	202.*	50-150	L525661-01	WG545307
o-Terphenyl					2304.*	50-150		WG545307
1-Methylnaphthalene	mg/kg	0.0279	0	.033	64.5	19-131	L525701-04	WG545418
2-Chloronaphthalene	mg/kg	0.0254	0	.033	76.9	38-117	L525701-04	WG545418
2-Methylnaphthalene	mg/kg	0.0271	0	.033	82.2	18-125	L525701-04	WG545418
Acenaphthene	mg/kg	0.0254	0	.033	77.0	31-120	L525701-04	WG545418
Acenaphthylene	mg/kg	0.0256	0	.033	77.7	34-116	L525701-04	WG545418
Anthracene	mg/kg	0.0183	0	.033	55.4	32-131	L525701-04	WG545418
Benzo (a) anthracene	mg/kg	0.0121	0	.033	36.5	32-131	L525701-04	WG545418
Benzo (a) pyrene	mg/kg	0.00955	0	.033	28.9	28-130	L525701-04	WG545418
Benzo (b) fluoranthene	mg/kg	0.0114	0	.033	34.6*	37-130	L525701-04	WG545418
Benzo (g, h, i) perylene	mg/kg	0.00273	0	.033	8.27*	10-134	L525701-04	WG545418
Benzo (k) fluoranthene	mg/kg	0.0122	0	.033	36.8	31-129	L525701-04	WG545418
Chrysene	mg/kg	0.0117	0	.033	35.5	25-137	L525701-04	WG545418
Dibenz (a, h) anthracene	mg/kg	0.00311	0	.033	9.43*	20-134	L525701-04	WG545418
Fluoranthene	mg/kg	0.0180	0	.033	54.5	27-138	L525701-04	WG545418
Fluorene	mg/kg	0.0236	0	.033	71.6	26-136	L525701-04	WG545418
Indeno (1, 2, 3-cd) pyrene	mg/kg	0.00306	0	.033	9.26*	16-135	L525701-04	WG545418
Naphthalene	mg/kg	0.0265	0	.033	80.3	22-121	L525701-04	WG545418
Phenanthrene	mg/kg	0.0199	0	.033	60.2	27-133	L525701-04	WG545418
Pyrene	mg/kg	0.0159	0	.033	48.1	22-133	L525701-04	WG545418
2-Fluorobiphenyl					95.73	33-114		WG545418
Nitrobenzene-d5					94.92	21-120		WG545418
p-Terphenyl-d14					89.60	18-142		WG545418
Mercury	mg/kg	0.246	0	.25	98.4	70-130	L525741-01	WG545483
Benzene	mg/kg	0.173	0	.05	69.2	32-137	L526116-01	WG545805
Ethylbenzene	mg/kg	0.182	0	.05	72.9	10-150	L526116-01	WG545805
Toluene	mg/kg	0.187	0	.05	74.8	20-142	L526116-01	WG545805
Total Xylene	mg/kg	0.551	0	.15	73.5	16-141	L526116-01	WG545805
a,a,a-Trifluorotoluene (FID)					96.25	59-128		WG545805
a,a,a-Trifluorotoluene (PID)					99.26	54-144		WG545805
TPH (GC/FID) Low Fraction	mg/kg	19.4	0	5.5	70.6	55-109	L526116-01	WG545805
a,a,a-Trifluorotoluene (FID)					99.47	59-128		WG545805
a,a,a-Trifluorotoluene (PID)					105.7	54-144		WG545805
Arsenic	mg/kg	38.8	1.30	50	75.0	75-125	L525660-02	WG545451
Barium	mg/kg	150.	108.	50	84.0	75-125	L525660-02	WG545451
Boron	mg/kg	33.0	2.44	50	61.1*	75-125	L525660-02	WG545451
Cadmium	mg/kg	38.4	0	50	76.8	75-125	L525660-02	WG545451
Chromium	mg/kg	51.1	11.0	50	80.2	75-125	L525660-02	WG545451
Copper	mg/kg	55.7	15.0	50	81.4	75-125	L525660-02	WG545451
Lead	mg/kg	58.5	18.0	50	81.0	75-125	L525660-02	WG545451
Nickel	mg/kg	51.8	12.0	50	79.6	75-125	L525660-02	WG545451
Selenium	mg/kg	36.6	0	50	73.6*	75-125	L525660-02	WG545451
Silver	mg/kg	40.1	0.426	50	79.3	75-125	L525660-02	WG545451
Zinc	mg/kg	92.8	54.0	50	77.6	75-125	L525660-02	WG545451

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Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Chromium, Hexavalent	mg/kg	1.04	0	20	5.20*	50-150	L525693-02	WG545898
Benzene	mg/kg	0.246	0	.05	98.2	32-137	L525694-01	WG545480
Ethylbenzene	mg/kg	0.222	0	.05	88.9	10-150	L525694-01	WG545480
Toluene	mg/kg	0.229	0	.05	91.6	20-142	L525694-01	WG545480
Total Xylene	mg/kg	0.630	0	.15	84.0	16-141	L525694-01	WG545480
a, a, a-Trifluorotoluene (PID)					101.1	54-144		WG545480
TPH (GC/FID) Low Fraction	mg/kg	462.	2.71	5.5	106.	55-109	L525701-08	WG545480
a, a, a-Trifluorotoluene (FID)					111.0	59-128		WG545480
TPH (GC/FID) Low Fraction	mg/kg	368.	2.27	5.5	139.*	55-109	L525701-10	WG545480
a, a, a-Trifluorotoluene (FID)					117.2	59-128		WG545480

Analyte	Units	Matrix Spike			Duplicate %Rec	Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref							
TPH (GC/FID) High Fraction	ppm	328.	341.	180.*	50-150	3.96	20	L525661-01	WG545307	
o-Terphenyl				2226.*	50-150				WG545307	
1-Methylnaphthalene	mg/kg	0.0258	0.0279	78.2	19-131	7.72	30	L525701-04	WG545418	
2-Chloronaphthalene	mg/kg	0.0232	0.0254	70.2	38-117	9.14	26	L525701-04	WG545418	
2-Methylnaphthalene	mg/kg	0.0248	0.0271	75.0	18-125	9.20	29	L525701-04	WG545418	
Acenaphthene	mg/kg	0.0241	0.0254	72.9	31-120	5.43	30	L525701-04	WG545418	
Acenaphthylene	mg/kg	0.0245	0.0256	74.2	34-116	4.59	29	L525701-04	WG545418	
Anthracene	mg/kg	0.0156	0.0183	47.4	32-131	15.6	26	L525701-04	WG545418	
Benzo(a)anthracene	mg/kg	0.00995	0.0121	30.2*	32-131	19.1	31	L525701-04	WG545418	
Benzo(a)pyrene	mg/kg	0.00759	0.00955	23.0*	28-130	22.9	28	L525701-04	WG545418	
Benzo(b)fluoranthene	mg/kg	0.00953	0.0114	28.9*	37-130	18.0	41	L525701-04	WG545418	
Benzo(g,h,i)perylene	mg/kg	0.00218	0.00273	6.62*	10-134	22.3	26	L525701-04	WG545418	
Benzo(k)fluoranthene	mg/kg	0.00899	0.0122	27.2*	31-129	29.9	42	L525701-04	WG545418	
Chrysene	mg/kg	0.00936	0.0117	28.4	25-137	22.2*	22	L525701-04	WG545418	
Dibenz(a,h)anthracene	mg/kg	0.00263	0.00311	7.96*	20-134	16.9	25	L525701-04	WG545418	
Fluoranthene	mg/kg	0.0166	0.0180	50.4	27-138	7.66	35	L525701-04	WG545418	
Fluorene	mg/kg	0.0218	0.0236	66.2	26-136	7.88	30	L525701-04	WG545418	
Indeno(1,2,3-cd)pyrene	mg/kg	0.00256	0.00306	7.77*	16-135	17.6	26	L525701-04	WG545418	
Naphthalene	mg/kg	0.0254	0.0265	76.9	22-121	4.37	30	L525701-04	WG545418	
Phenanthrene	mg/kg	0.0181	0.0199	54.9	27-133	9.09	36	L525701-04	WG545418	
Pyrene	mg/kg	0.0131	0.0159	39.6	22-133	19.4	33	L525701-04	WG545418	
2-Fluorobiphenyl				84.37	33-114				WG545418	
Nitrobenzene-d5				84.26	21-120				WG545418	
p-Terphenyl-d14				75.32	18-142				WG545418	
Mercury	mg/kg	0.233	0.246	93.2	70-130	5.43	20	L525741-01	WG545483	
Benzene	mg/kg	0.197	0.173	78.7	32-137	12.9	39	L526116-01	WG545805	
Ethylbenzene	mg/kg	0.201	0.182	80.4	10-150	9.87	44	L526116-01	WG545805	
Toluene	mg/kg	0.201	0.187	80.2	20-142	6.96	42	L526116-01	WG545805	
Total Xylene	mg/kg	0.602	0.551	80.3	16-141	8.78	46	L526116-01	WG545805	
a, a, a-Trifluorotoluene (FID)				96.66	59-128				WG545805	
a, a, a-Trifluorotoluene (PID)				99.39	54-144				WG545805	
TPH (GC/FID) Low Fraction	mg/kg	21.4	19.4	77.7	55-109	9.57	20	L526116-01	WG545805	
a, a, a-Trifluorotoluene (FID)				100.2	59-128				WG545805	
a, a, a-Trifluorotoluene (PID)				106.5	54-144				WG545805	

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Analyte	Units	Matrix Spike Duplicate			Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref	%Rec					
Arsenic	mg/kg	42.4	38.8	82.2	75-125	8.87	20	L525660-02	WG545451
Barium	mg/kg	181.	150.	146.*	75-125	18.7	20	L525660-02	WG545451
Boron	mg/kg	36.5	33.0	68.1*	75-125	10.1	20	L525660-02	WG545451
Cadmium	mg/kg	42.2	38.4	84.4	75-125	9.43	20	L525660-02	WG545451
Chromium	mg/kg	58.2	51.1	94.4	75-125	13.0	20	L525660-02	WG545451
Copper	mg/kg	60.3	55.7	90.6	75-125	7.93	20	L525660-02	WG545451
Lead	mg/kg	61.2	58.5	86.4	75-125	4.51	20	L525660-02	WG545451
Nickel	mg/kg	56.0	51.8	88.0	75-125	7.79	20	L525660-02	WG545451
Selenium	mg/kg	40.6	36.8	81.2	75-125	9.82	20	L525660-02	WG545451
Silver	mg/kg	43.6	40.1	86.3	75-125	8.36	20	L525660-02	WG545451
Zinc	mg/kg	106.	92.8	104.	75-125	13.3	20	L525660-02	WG545451
Chromium, Hexavalent	mg/kg	0.760	1.04	3.80*	50-150	31.1*	20	L525693-02	WG545898
Benzene	mg/kg	0.260	0.246	104.	32-137	5.80	39	L525694-01	WG545480
Ethylbenzene	mg/kg	0.248	0.222	99.0	10-150	10.7	44	L525694-01	WG545480
Toluene	mg/kg	0.246	0.229	98.6	20-142	7.40	42	L525694-01	WG545480
Total Xylene	mg/kg	0.704	0.630	93.8	16-141	11.0	46	L525694-01	WG545480
a,a,a-Trifluorotoluene (PID)				102.4	54-144				WG545480
TPH (GC/FID) Low Fraction	mg/kg	446.	462.	103.	55-109	3.56	20	L525701-08	WG545480
a,a,a-Trifluorotoluene (FID)				111.4	59-128				WG545480
TPH (GC/FID) Low Fraction	mg/kg	365.	368.	137.*	55-109	0.920	20	L525701-10	WG545480
a,a,a-Trifluorotoluene (FID)				115.5	59-128				WG545480

Batch number / Run number / Sample number cross reference

WG545307: R1761530: L525693-01 02 03
 WG545480: R1763070: L525693-02 03
 WG545424: R1763450: L525693-02 03
 WG545418: R1763514: L525693-01 02 03
 WG545483: R1765190: L525693-02 03
 WG545464: R1765211: L525693-02 03
 WG545683: R1765670: L525693-02 03
 WG545805: R1766570: L525693-01
 WG545451: R1767351: L525693-02 03
 WG545898: R1768530: L525693-02 03
 WG545954: R1771190: L525693-02 03

* * Calculations are performed prior to rounding of reported values.
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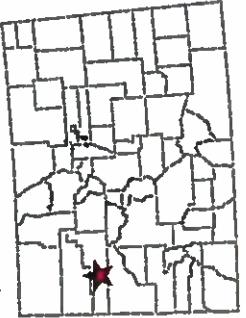
The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Project Location



COLORADO

Legend

- Sample Location
- Existing Road



Berry Petroleum Company

**Latham O-32
Well Pad
Sample**

**Locations for
Background Arsenic
Concentrations**
Garfield County, Colorado

August 2011 Figure 1

Nicholson GeoSolutions, LLC





Linn Operating, Inc.
Piceance Asset
Parachute, Colorado

O32 596 Interim Site Stabilization Plan

July 14, 2014

- Bird net and fence will be removed from over and around pit.
- Pit will be drained; liner removed and disposed of at a certified land fill.
- Soil samples from bottom of pit will be analyzed and if COGCC Table 910-1 standards are met, pit will qualify for backfilling.
- If COGCC Table 910-1 standards are not met, then the spoil material taken from the pit bottom will be treated on site by land farming on the pad. The pit will be excavated until clean soil is apparent and will be tested again and will be repeated until 910-1 Standards are met. The existing spoil material that is on site will also be tested and land farmed on site if required. The treatment will include adding nitrogen and/or phosphorus amendments. The treated contaminated material meeting COGCC minimum standards will be blended with clean non-contaminated on-site materials and will be buried on location per COGCC standards.
- Semi-annual sampling will be conducted until all land farming areas meet safe standards set and approved by the COGCC.
- Exterior slopes on east, west, and south sides shall be pulled up and materials shall be pushed into existing pit.
- Exterior slopes shall be laid back at a minimum 3:1
- Top soil will be spread over all slopes and will be reseeded with a landowner approved seed mix.
- Linn Operating, Inc. has addressed and accommodated the wildlife concerns during the site stabilization of this pad.