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September, 22, 2008

Mr. Matthew J. Lepore Holme, Roberts & Owen LLP 1700 Lincoln Street, Suite 4100 Denver, CO 80203

RE: Summary of Soil Gas Sampling at the Nonsuch 697-14 Well Pad.

Dear Mr. Lepore:

Holme, Roberts & Owen LLP (HRO) retained Cordilleran Compliance Services, Inc. (Cordilleran) to complete a soil gas (vapor) survey at the Nonsuch Natural Gas, Inc. (Nonsuch) 697-14 well pad located in Section 14, Township 6 south, Range 97 west in Garfield County, Colorado. The general site location is shown on Figure 1. A topographic map of the area showing the well pad location is provided as Figure 2. Photographs of the site are included in Attachment 1.

The purpose of the soil vapor survey was to evaluate potential vapor concentrations of benzene, toluene, ethylbenzene, xylenes (BTEX) and various other hydrocarbon compounds that may be related to natural gas production activities at the pad. Prior to completing the soil vapor survey, Cordilleran prepared a work plan for the soil vapor sampling activities which was submitted to and conditionally approved by the Colorado Oil and Gas Conservation Commission (COGCC). Cordilleran mobilized to the site on Tuesday, August 26, 2008 and completed the soil vapor sampling activities on Wednesday August 27. A summary of the soil vapor sampling activities and results is provided in the following sections.

FIELD PROCEDURES

Prior to beginning the subsurface investigation, High Plains contacted the Utility Notification Center of Colorado to mark commercial buried utilities in the vicinity of the subsurface investigation area. Nonsuch personnel marked the locations of natural gas gathering lines and produced water flow lines lying within the investigation area. In addition, Cordilleran developed a Health and Safety Plan for the soil vapor sampling activities.

Soil Gas Sampling Procedures

Soil gas samples were collected using a direct-push Geoprobe Model 5400 rig equipped to advance steel rods to the desired sampling depth. Upon reaching the sampling depth, the lead rod was retracted approximately 6 inches from the bottom of the boring to disengage the expendable drive point to allow soil gas to enter the rod. Gas contained in the interstitial soil

spaces surrounding the probe was sampled through 3/8-inch O.D. low density polyethylene tubing inserted down through the center of the steel rod and connected to a dedicated, slotted, steel adapter tip at the bottom of the boring. Relative air-soil permeability testing was attempted by comparing air flow rates measured using a flow meter. Due to the extremely low flow rates the primary use of this data, however, is to demonstrate that short circuiting did not occur at any of the sampling locations.

Prior to collecting each soil vapor sample the purge air stream was monitored with a photoionization detector (PID) and a Pragmatics methane detector. In addition, purge flow rate and volume observations were completed prior to sampling to optimize these parameters and to determine if short circuiting to the surface was occurring around the probe boring.

Soil gas samples were collected and contained within Tedlar bags connected to the polyethylene tubing via a hose fitting. The tubing and Tedlar bag were dedicated to each probe location.

Where possible, soil gas samples were collected from two sample depths at a given location. The target sample intervals were to include one shallow soil gas sample, e.g. five feet bgs, and one deep soil gas sample (e.g. 10 feet, 15 feet, or 20 feet, bgs). However, several of the sample locations met refusal in bedrock at depths that did not allow for more than one sample interval and four of the probe locations met refusal in bedrock at depths ranging from 2 feet bgs to five feet bgs. Due to the extremely shallow depth, soil vapor samples were not collected from these four probe locations and no PID or FID monitoring was performed.

The Tedlar bag samples were stored in plastic coolers and kept cool pending onsite laboratory analysis. The samples were analyzed within 24 hours after collection.

Analytical Methods

Samples were analyzed for the volatile organic compounds benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B. This method was used for analysis of volatile organic compounds in soil vapor and/or air samples by a mass spectrometer interfaced to a gas chromatograph. Other hydrocarbon compounds that were "tentatively identified compounds (TICs)" were also reported.

The ChemSolutions mobile laboratory is ISO-17025 accredited for Methods 8260B. As part of their accreditation they participate in PT studies twice a year for the method and follow all method-required QC protocols.

Method 8260B QC requirements include a BFB tune check every 12 hours, an initial 5 point calibration upon arrival on site, and continued calibration checks using secondary source

standards prior to analyzing samples and after every 12 hours of analysis time. Blanks are analyzed after every calibration check and after high level samples are detected. All blanks, QC samples, and samples were spiked with 4 surrogate standards. Samples were analyzed in daily batches of at most 20 samples. Every QC batch had a LCS spike, sample matrix spike, and matrix spike duplicate. In house QC limits were generated for surrogate and spike recoveries.

All QC results are included as part of the final report along with chromatograms of each sample run. Copies of the laboratory reports are included in Attachment 2. A summary of the laboratory results is provided in Table 2.

Decontamination

The sampling equipment was thoroughly cleaned prior to the sampling activities and between each use at the site. Decontamination procedures included a wash with a detergent solution, followed by a Simple GreenTM rinse, a deionized water rinse, and air drying.

FIELD RESULTS

Upon arriving at the subject well pad Cordilleran marked a grid system, based on ten-foot grid nodes, overlying the presumed location of the reserve pit. There is some conflicting information concerning the dimensions and location of the former reserve pit, but Cordilleran considers an aerial photograph of the well site taken while the reserve pit was still open to be the most reliable source. The aerial photo indicates that the pit measured 40 feet wide by 80 feet long with its longitudinal axis aligned NE to SW beginning at a point approximately 100 feet southwest of the AST located at the site.

Cordilleran used known control points at the site to find the location of the pit and lay out the sampling grid. Cordilleran measured from the AST southwest 100 feet to find the northeast end of the pit. Then from the point at the southwest end of the well pad where the longitudinal axis of the reserve pit would have intersected the southwest end of the well pad, Cordilleran measured 70 feet northeast (along the longitudinal axis of the pit) to find the southwest end of the pit. The sampling grid was established over this area by setting a baseline 40 feet northwest of the longitudinal axis of the former reserve pit. This baseline (the "A" line) aligns with the fence that runs along the northwest side of the production pit. Additional longitudinal grid lines, labeled "B through "K", were established towards the southeast every 10 feet along the fence that runs along the southwest side of the production pit. In addition, a total of 10 lateral grid lines were established by measuring every 10 feet southwest from the fence along the southwest side of the production pit (a total of 100 feet southwest). Given this grid system, the southwest corner of the fence around the production pit corresponds with grid location A10 (which is located 100 feet northeast and 0 feet southeast).

The soil gas probe locations were then selected using a systematic-random sampling method by establishing a triangular grid of 11 sample locations over the former pit area. Unfortunately, as discussed below, several selected probe/sampling locations were located along the steep side slopes of the berm that had been constructed at the site when the reserve pit was reclaimed in May 2008. The sampling grid and sampling locations are shown on Figure 3 along with the pertinent site features (well, production pit, AST, and former reserve pit). Figure 4 shows the same site information superimposed onto a satellite image of the site that shows the outline of the former reserve pit.

Based on the historic aerial photo it appears that the footprint of the well pad was changed when the reserve pit was reclaimed in early 2008. The changes to the well pad include filling the former reserve pit, expanding the pad surface along the northwest and southeast sides, and constructing an "L" shaped berm over a portion of the former reserve pit from the southwest corner of the fence around the production pit southwest approximately 80 feet and then approximately 70 feet southeast. The top of the berm is approximately 5 feet to 8 feet higher than the ground surface of the rest of the well pad and the side slope of the berm runs along the longitudinal axis of the former reserve pit. The steepness of the berm prevented drilling within the reserve pit in areas where the berm was present, so it was not possible to confirm the position of the pit as planned. However, based on the measurements detailed above and the observations during the probing activities, we are confident that at least four of the probe holes were placed within the former reserve pit. A photographic log of the site and the soil vapor sampling activities is included in Attachment 1. A summary of the soil vapor sampling activities and results is provided in the following sections.

Soil Vapor Collection

The soil vapor sample collection activities were completed on August 27, 2008. Cordilleran met with High Plains Drilling at the site prior to initiating the field activities and reviewed the sampling plan and the site health and safety plan. A total of 11 probe holes were advanced during the soil vapor sampling activities. The total depth of the probe holes ranged from two feet bgs (presumably outside of the former reserve pit) to a maximum depth of 16 feet bgs (presumably within the former reserve pit). In locations where probe refusal was encountered at depths less than 5 feet bgs, the probing location was moved several feet towards the expected location of the former pit and another probe hole was attempted. When the probe rods were removed from the ground at probe hole location D10 the soil on the probe tip appeared to be wet, so a 1 ½ inch diameter polyvinyl chloride (PVC) well screen was placed in the probe hole to monitor for potential groundwater.

After each probe hole was advanced to the desired depth, the probe rods were retracted approximately 6-inches to open the vapor collection port. An appropriate length of polyethylene tubing was inserted into the rods and threaded into the sampling tip creating a seal inside the rods that isolated the target soil vapor sampling interval from the rest of the probe hole. A peristaltic pump was attached to the dedicated tubing in the probe hole and the air in the probe hole was evacuated for 10 minutes prior to collecting the soil vapor sample. A PID and a Pragmatics flame ionization detector (FID) were used to monitor the concentration of volatile organic vapors in the purge air stream. In addition, Cordilleran attempted to measure the flow velocity of the purge air stream using an air flow meter. However, as expected for this type of geologic formation, the air flow velocities of the purge air stream in all of the purge holes were too low to be measured by the air flow meter. The PID and FID readings are summarized in Table 1.

As shown on Table 1, the only probe hole that had a measureable PID reading was D-10.5 and the highest observed PID reading in probe hole D-10.5 was 3.4 parts per million (ppm). None of the other probe hole had any PID readings greater than 1 ppm. No odors were detected in the purge air from any of the probe holes.

After the purging of the probe hole was complete, a 1-liter Tedlar bag was attached to the polyethylene tubing and allowed to fill. When the Tedlar bag was full, it was sealed and placed in a cooler with ice for storage prior to analysis. All appropriate sample documentation information was entered on the label of each Tedlar bag (sample name, date, sample time, sampler's initials) and a chain of custody was completed listing each sample and the requested analytical parameters. A total of seven soil vapor samples were collected from the eleven probe holes. All of the soil vapor samples collected at the site were hand delivered to ChemSolutions mobile laboratory on August 27, 2008.

Laboratory Results for Soil Vapor Samples

As mentioned previously, the seven soil vapor samples were analyzed for the volatile organic compounds benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260B. Cordilleran also requested that ChemSolutions report other hydrocarbon compounds that were tentatively identified compounds.

The laboratory results for the soil vapor samples are summarized in Table 2. As shown in Table 2, detectable concentrations of several target analytes were reported in five of the seven soil vapor samples. The detected compounds include:

- Benzene was reported in:
- o NSP-D10-16 at $0.14 \,\mu g/L$,

- o NSP-D10-10 at $0.15 \,\mu g/L$,
- o NSP-B5-16 at 0.059J μ g/L, and
- o NSP-D10.5-10 at $0.10 \,\mu g/L$;
- Toluene was reported in:
- o NSP-D10-16 at 0.15 μ g/L,
- o NSP-A15-12 at $0.085 J \mu g/L$, and
- o NSP-D10.5-10 at 0.074J μ g/L; and
- Xylenes (total) were reported in:
 - o NSP-D10-16 at $0.10 \,\mu g/L$,
 - o NSP-B5-16 at 0.13 μ g/L, and
 - o NSP-D10.5-10 at 0.15 μ g/L.

Water Sample Collection Activities and Laboratory results

When Cordilleran returned to the site on August 28,2008 and checked the PVC installed in probe hole D10, it was determined that sufficient water was present to allow the collection of a water sample. Cordilleran used a length of polyethylene tubing to collect a water sample from D10 and place the water in a 40 milliliter vial. The water sample was hand delivered to ChemSolutions under chain of custody and analyzed for VOCs by EPA method 8260b. The laboratory results for the D10 water sample are summarized in Table 3. As shown on Table 3, a total of six target compounds were reported in the sample including:

- benzene at a concentration of 29 μg/L;
- ethylbenzene at 5.8 μg/L;
- xylenes at 34 µg/L;
- 1,3,5-trimethylbenzene at 17 μg/L;
- 1,2,4-trimethylbenzene at 32 μg/L; and
- Naphthalene at 13 μg/L.

No other VOCs were reported in the sample.

Conclusions

The results of the soil vapor sampling and analysis indicate the following:

- The well pad has been reconfigured since the aerial photograph showing the reserve pit
 was taken. The reserve pit has been reclaimed (filled) and an "L" shaped berm was
 constructed in the southwest part of the pad which partially covers the former reserve pit.
 In addition, the overall foot print of the well pad was widened to the northwest and to the
 southeast.
- 2. The location of the former reserve pit was determined by measuring from known points shown on the aerial photograph and a 10-foot grid system was established over the pit area. The grid system is tied to the fence around the production pit and the #14 well head.
- 3. A total of eleven Geoprobe holes were advanced at the site. The total depths for the probe holes ranged from 2 feet bgs to 16 feet bgs.
- 4. The total depths of the probe holes, observations as the probe holes were advanced, and subsurface soil material observed on the probe tip indicates that probe holes D10, D10.5, B5 and E8 were within the former reserve pit. The other seven probe holes were located outside of the former reserve pit.
- 5. Very low levels of one or more hydrocarbon constituents were detected in four boreholes: D-10, D10.5, B-5, and A-15.
- 6. Water was encountered in probe hole D10 at approximately 12 feet bgs. The depth to water in the pit is approximately 4 feet above the bottom of the former pit which shows some degree of containment within the pit.
- 7. The laboratory results for the D10 water sample indicated detectable concentrations of six target analytes.

We appreciate the opportunity to assist you with this project. Please do not hesitate to contact us if you have any questions concerning the results of the soil vapor sampling activities or our recommendations.

Sincerely,

David C. Cloutier, L.P. G.

Associate Environmental Scientist

Brad Stephenson, P.G

Associate Hydrogeologist

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- 2. The location of the former reserve pit was determined by measuring from known points shown on the aerial photograph and a 10-foot grid system was established over the pit area. The grid system is tied to the fence around the production pit and the #14 well head.
- 3. A total of eleven Geoprobe holes were advanced at the site. The total depths for the probe holes ranged from 2 feet bgs to 16 feet bgs.
- 4. The total depths of the probe holes, observations as the probe holes were advanced, and subsurface soil material observed on the probe tip indicates that probe holes D10, D10.5, B5 and E8 were within the former reserve pit. The other seven probe holes were located outside of the former reserve pit.
- 5. Very low levels of one or more hydrocarbon constituents were detected in four boreholes: D-10, D10.5, B-5, and A-15.
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- 7. The laboratory results for the D10 water sample indicated detectable concentrations of six target analytes.

We appreciate the opportunity to assist you with this project. Please do not hesitate to contact us if you have any questions concerning the results of the soil vapor sampling activities or our recommendations.

Sincerely,

David C. Cloutier, L.P. G. Associate Environmental Scientist Brad Stephenson, P.G Associate Hydrogeologist

Table 1
Summary of Probe Hole Coordinates, Depths, and PID and FID Readings

Probe ID	Latitude	Longitude	Total Depth	PID Reading	FID Readings
A-15	39.51721	108.19351	12' bgs	< 1.0 ppm	< 1.0 ppm
B-5	39.51694	108.19370	16' bgs	< 1.0 ppm	< 1.0 ppm
B-8	39.51703	108.19364	7' bgs	< 1.0 ppm	< 1.0 ppm
D-10	39.51704	108.19352	16' bgs	< 1.0 ppm	< 1.0 ppm
D-10.5	39.51708	108.19353	10' bgs	3.4 ppm	< 1.0 ppm
E-8	39.51699	108.19354	8' bgs	< 1.0 ppm	< 1.0 ppm
F-3	39.51690	108.19360	7' bgs	< 1.0 ppm	< 1.0 ppm
F-6	39.51692	108.19357	3' bgs	< 1.0 ppm	< 1.0 ppm
F-9	39.51696	108.19347	2' bgs	< 1.0 ppm	< 1.0 ppm
K-15	39.51709	108.19322	5' bgs	< 1.0 ppm	< 1.0 ppm
P-10	39.51687	108.19317	5' bgs	< 1.0 ppm	< 1.0 ppm

Notes: bgs = below ground surface ppm = parts per million

Table 2
Summary of Laboratory Results for Soil Vapor Samples

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes
NSP-D10-16ft	0.14 μg/L	0.15 μg/L	<0.10 µg/L	0.13 μg/L
NSP-D10-10ft	0.15 μg/L	<0.10 µg/L	<0.10 µg/L	<0.10 µg/L
NSP-E8-7.5ft	<0.10 µg/L	<0.10 µg/L	<0.10 µg/L	<0.10 µg/L
NSP-F3-6ft	$<0.10~\mu g/L$	<0.10 µg/L	<0.10 µg/L	<0.10 µg/L
NSP-A15-12ft	$<0.10 \mu g/L$	0.085J μg/L	$<0.10~\mu g/L$	<0.10 µg/L
NSP-B5-16ft	0.059J μg/L	<0.10 µg/L	<0.10 µg/L	0.13 μg/L
NSP-D10.5-10ft	0.10 μg/L	0.074J μg/L	<0.10 µg/L	0.15 μg/L

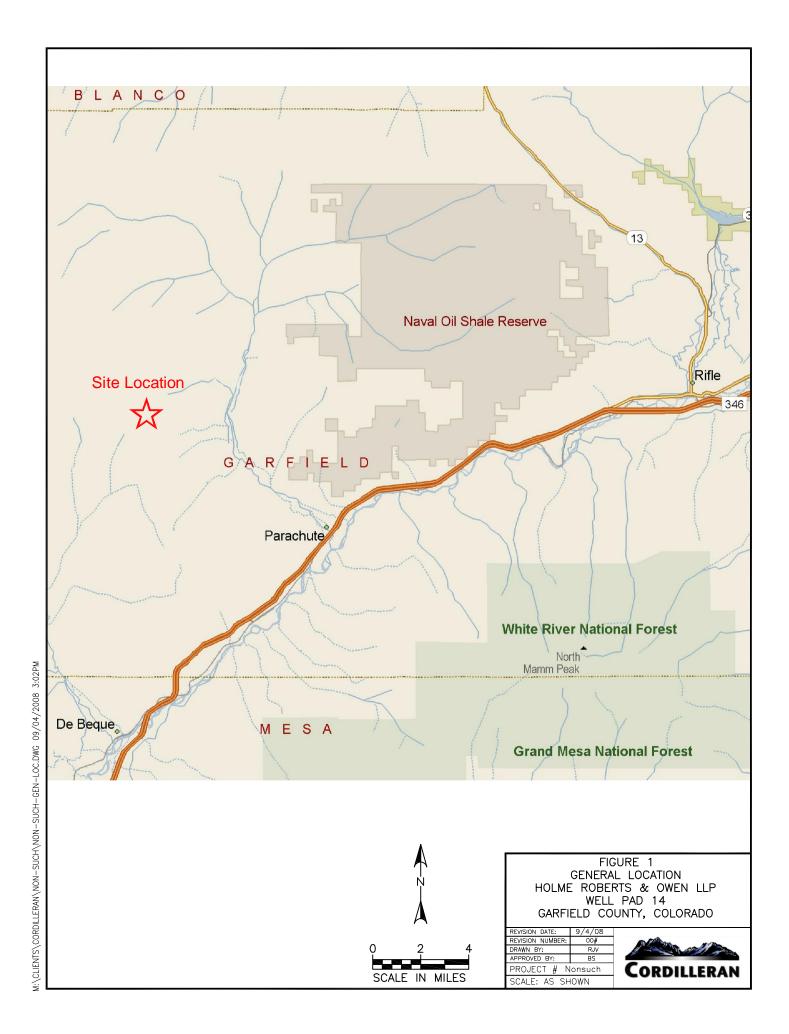
Notes: $\mu g/L = micro grams per liter$

J = estimated value

Table 3
Summary of Method 8260b Results for Water Sample NSP-D10-16W

Parameter	Result
Benzene	29 μg/L
Ethylbenzene	5.8 μg/L
Xylenes	34 μg/L
1,3,5-Trimethylbenzene	17 μg/L
1,2,4-Trimethylbenzene	32 μg/L
Naphthalene	13 μg/L

Note: Only those compounds on the 8260b analyte list that were detected in the sample are shown in the table. Compounds on the 8260b analyte list that were not detected in the sample are not shown above.



SCALE IN FEET

PROJECT # Nonsuch SCALE: AS SHOWN

CORDILLERAN



Attachment 1 Photographic Log



Photo 1 – View of the Nonsuch 697-14 well pad from the southeast.



Photo 2 – View SW from the SW fence corner along longitudinal the axis of the sampling grid.



Photo 3 – View SE from the SW corner fence corner along the lateral axis of the sampling grid. Note GeoProbe rig at Probe location D10



Photo 4 – View of the lined production pit located at the NE end of the former reserve pit.



Photo $5 - View\ NE$ along the fence along the NW side of the production pit.



Photo 6 – View SW along the SE side of the well pad.



Photo 7 – View of the GeoProbe rig as it advanced probe hole B5. Note fill thickness.



Photo 8 – View of GeoProbe rig from probe hole K15 as it advanced hole A15.



Photo 9-View of GeoProbe rig as it advanced hole D10.5. Note hole D10 in left foreground.



Photo 10 – View of monitoring well near Prather spring with Nonsuch #14 well pad in background.

Attachment 2 Laboratory Reports

TABLE 1

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-D10-16 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/27/08 Sample Matrix: Soil Vapor

Analyte Benzene Toluene Ethylbenzene Total Xylene	Concentration 0.14 0.15 ND 0.13	Reporting <u>Limit</u> 0.10 0.10 0.10 0.10
Tentatively Identified Compounds		
Methyl-cyclohexane	3.3	0.10
1,3 Dimethyl cyclohexane	1.4	0.10
2-Methyl hexane	1.5	0.10
3-Methyl hexane	1.0	0.10
3-Methyl heptane	0.73	0.10

	Amount	%
<u>Surrogate</u>	Recovered	Recovery
Toluene-D8	1.05	105

TABLE 2

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-D10-10 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/28/08 Sample Matrix: Soil Vapor

Analyte Benzene Toluene Ethylbenzene Total Xylene	Concentration 0.15 ND ND ND ND	Reporting <u>Limit</u> 0.10 0.10 0.10 0.10
Tentatively Identified Compounds		
2-Methyl pentane	0.38	0.10
Hexane	0.25	0.10
Methyl cyclohexane	1.2	0.10
Octane	0.28	0.10
3 Methyl heptane	0.52	0.10
1,2 Dimethyl cyclohexane	0.36	0.10
4 Methyl octane	0.29	0.10
3 Methyl octane	0.30	0.10
	Amount	%
<u>Surrogate</u>	Recovered	Recovery
Toluene-D8	1.02	102

TABLE 3

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-E8-7.5 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/27/08 Sample Matrix: Soil Vapor

Analyte Benzene Toluene Ethylbenzene Total Xylene	Concentration ND ND ND ND ND ND	Reporting <u>Limit</u> 0.10 0.10 0.10 0.10
Tentatively Identified Compounds		
Methyl cyclohexane	0.48	0.10
1,3 Dimethyl cyclohexane	0.43	0.10
1,1,3 Trimethyl cyclohexane	0.40	0.10

	Amount	%
<u>Surrogate</u>	Recovered	Recovery
Toluene-D8	1.05	105

TABLE 4

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-F3-6 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/27/08 Sample Matrix: Soil Vapor

		Reporting
<u>Analyte</u>	Concentration	<u>Limit</u>
Benzene	ND	0.10
Toluene	ND	0.10
Ethylbenzene	ND	0.10
Total Xylene	ND	0.10

Tentatively Identified Compounds

None Detected

 Amount
 %

 Surrogate
 Recovered
 Recovery

 Toluene-D8
 1.02
 102

TABLE 5

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-A15-12 Client Project ID: Nonsuch #14 EPA Method 8260B

Linita: ua/l

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/28/08 Sample Matrix: Soil Vapor

Analyte Benzene Toluene Ethylbenzene Total Xylene	Concentration ND 0.085J ND ND	Reporting <u>Limit</u> 0.10 0.10 0.10 0.10
Tentatively Identified Compounds Methyl cyclohexane 2,4 Dimethyl heptane	0.23 0.16	0.10 0.10
<u>Surrogate</u>	Amount <u>Recovered</u>	% <u>Recovery</u>

1.02

102

ND= Not detected

Toluene-D8

J=Analyte detected below the reporting limit.

TABLE 6

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-B-5-16 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/28/08 Sample Matrix: Soil Vapor

		Reporting
<u>Analyte</u>	Concentration	<u>Limit</u>
Benzene	0.059J	0.10
Toluene	ND	0.10
Ethylbenzene	ND	0.10
Total Xylene	0.13	0.10
Tentatively Identified Compounds		
Methyl cyclohexane	1.2	0.10
1,3 Dimethyl cyclohexane	0.88	0.10
3-Methyl heptane	0.28	0.10
1,2 Dimethyl cyclohexane	0.32	0.10
1,1,3 Trimethyl cyclohexane	0.46	0.10
	Amount	%
Surrogate	Recovered	Recovery
Toluene-D8	0.99	99.2

ND= Not detected

J=Analyte detected below the reporting limit.

TABLE 7

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: NSP-D-10.5-10 Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: 8/27/08 Date Received: 8/27/08 Date Analyzed: 8/28/08 Sample Matrix: Soil Vapor

Analyte Benzene Toluene Ethylbenzene Total Xylene	Concentration 0.10 0.074J ND 0.15	Reporting <u>Limit</u> 0.10 0.10 0.10 0.10
Tentatively Identified Compounds		
2,2,6 Trimethyl decane	1.9	0.10
2,2,4,6,6 Pentamethyl heptane	0.79	0.10
3-Methyl, 5-propyl nonane	3.4	0.10
2,2,5 Trimethyl hexane	5.4	0.10
2,8 Dimethyl undecane	2.0	0.10
2,2,8 Trimethyl decane	0.22	0.10
3,7 Dimethyl nonane	0.45	0.10
Methyl cyclohexane	1.3	0.10
4-Methyl octane	1.1	0.10
	Amount	%
Surrogate	Recovered	Recovery
Toluene-D8	1.03	103

ND= Not detected

J=Analyte detected below the reporting limit.

TABLE 8 QUALITY CONTROL RESULTS Project ID: COR003

Client Project ID: Nonsuch #14

EPA Method 8260B

Units: ug/L

Date Sampled: n/a
Date Received: n/a

Date Analyzed: 8/27-8/28/08 Sample Matrix: Vapor

Sample #	<u>Benzene</u>	<u>Toluene</u>	Ethyl Benzene	Total Xylene	Surrogate <u>% Recovery</u>				
Blank 8/27	ND	ND	ND	ND	100				
Blank 8/28	ND	ND	ND	ND	104				
Laboratory Control Samples									
LCS Spike % Recovery	0.44 110	0.40 100	0.41 103	1.2 100	NA 103				
LCS Dupl. Spike % Recovery	0.42 105	0.40 100	0.38 95.0	1.2 100	NA 105				
Relative % Difference	4.65	0.00	7.59	0.00					

TABLE 9

VOLATILE ORGANIC COMPOUND RESULTS Project ID: COR003

Client Sample ID: D-10 Client Project ID: ROAN EPA Method 8260B Units: ug/L Date Sampled: 8/28/08 Date Received: 8/28/08 Date Analyzed: 8/29/08 Sample Matrix: Water

49.4

98.8

Units: ug/L				Sample Matrix:	vvater
		Reporting			Reporting
<u>Analyte</u>	Concentration	<u>Limit</u>	<u>Analyte</u>	Concentration	<u>Limit</u>
Dichlorodifluoromethane	ND	5	trans-1,3-Dichloropropene	ND	5
Chloromethane	ND	5	1,1,2-Trichloroethane	ND	5
Vinyl Chloride	ND	2	Tetrachloroethene	ND	5
Bromomethane	ND	5	Dibromochloromethane	ND	5
Chloroethane	ND	5	1,2-Dibromoethane	ND	5
Trichlorofluoromethane	ND	5	Chlorobenzene	ND	5
Acetone	ND	100	1,1,1,2-Tetrachloroethane	ND	5
1,1-Dichloroethene	ND	5	Ethylbenzene	5.8	5
Carbon Disulfide	ND	5	Total Xylene	34	5
Methylene Chloride	ND	5	Styrene	ND	5
Acrylonitrile	ND	10	Isopropylbenzene	ND	5
Methyl-t-butyl ether	ND	5	Bromoform	ND	5
trans-1,2-Dichloroethene	ND	5	n-Propylbenzene	ND	5
1,1-Dichloroethane	ND	5	1,2,3-Trichloropropane	ND	5
Vinyl acetate	ND	10	2-Chlorotoluene	ND	5
2-Butanone	ND	10	1,3,5-Trimethylbenzene	17	5
cis-1,2-Dichloroethene	ND	5	4-Chlorotoluene	ND	5
Chloroform	ND	5	t-Butylbenzene	ND	5
1,1,1-Trichloroethane	ND	5	1,2,4-Trimethylbenzene	32	5
Carbon Tetrachloride	ND	5	sec-Butylbenzene	ND	5
Benzene	29	5	p-Isopropyltoluene	ND	5
1,2-Dichloroethane	ND	5	1,1,2,2-Tetrachloroethane	ND	5
Trichloroethene	ND	5	1,3-Dichlorobenzene	ND	5
1,2-Dichloropropane	ND	5	1,4-Dichlorobenzene	ND	5
Dibromomethane	ND	5	n-Butylbenzene	ND	5
Bromodichloromethane	ND	5	1,2 Dichlorobenzene	ND	5
cis-1,3-Dichloropropene	ND	5	1,2-Dibromo-3-chloropropane	ND	5
4-Methyl-2-pentanone	ND	10	1,2,4-Trichlorobenzene	ND	5
Toluene	ND	5	Hexachlorobutadiene	ND	5
2-Hexanone	ND	10	1,2,3-Trichlorobenzene	ND	5
			Naphthalene	13	5
	Amount			Amount	
<u>Surrogate</u>	Recovered	% Recovery	<u>/ Surrogate</u>	Recovered	% Recovery
Dibromofluoromethane	50.1	100	Toluene-D8	50.0	100
D: 11 // D4	=0.0	400	D (1)	40.4	00.0

ND= Not detected

Dichloroethane-D4

53.9

108

Bromofluorobenzene

TABLE 10

VOLATILE ORGANIC COMPOUND RESULTS

Project ID: COR003

Sample ID: Method Blank Client Project ID: ROAN EPA Method 8260B Units: ug/L Date Sampled: NA Date Received: NA Date Analyzed: 8/29/08 Sample Matrix: Water

		Reporting			Reporting
<u>Analyte</u>	Concentration	<u>Limit</u>	Analyte	Concentration	<u>Limit</u>
Dichlorodifluoromethane	ND	5	trans-1,3-Dichloropropene	ND	5
Chloromethane	ND	5	1,1,2-Trichloroethane	ND	5
Vinyl Chloride	ND	2	Tetrachloroethene	ND	5
Bromomethane	ND	5	Dibromochloromethane	ND	5
Chloroethane	ND	5	1,2-Dibromoethane	ND	5
Trichlorofluoromethane	ND	5	Chlorobenzene	ND	5
Acetone	ND	100	1,1,1,2-Tetrachloroethane	ND	5
1,1-Dichloroethene	ND	5	Ethylbenzene	ND	5
Carbon Disulfide	ND	5	Total Xylene	ND	5
Methylene Chloride	ND	5	Styrene	ND	5
Acrylonitrile	ND	10	Isopropylbenzene	ND	5
Methyl-t-butyl ether	ND	5	Bromoform	ND	5
trans-1,2-Dichloroethene	ND	5	n-Propylbenzene	ND	5
1,1-Dichloroethane	ND	5	1,2,3-Trichloropropane	ND	5
Vinyl acetate	ND	10	2-Chlorotoluene	ND	5
2-Butanone	ND	10	1,3,5-Trimethylbenzene	ND	5
cis-1,2-Dichloroethene	ND	5	4-Chlorotoluene	ND	5
Chloroform	ND	5	t-Butylbenzene	ND	5
1,1,1-Trichloroethane	ND	5	1,2,4-Trimethylbenzene	ND	5
Carbon Tetrachloride	ND	5	sec-Butylbenzene	ND	5
Benzene	ND	5	p-Isopropyltoluene	ND	5
1,2-Dichloroethane	ND	5	1,1,2,2-Tetrachloroethane	ND	5
Trichloroethene	ND	5	1,3-Dichlorobenzene	ND	5
1,2-Dichloropropane	ND	5	1,4-Dichlorobenzene	ND	5
Dibromomethane	ND	5	n-Butylbenzene	ND	5
Bromodichloromethane	ND	5	1,2 Dichlorobenzene	ND	5
cis-1,3-Dichloropropene	ND	5	1,2-Dibromo-3-chloropropane	ND	5
4-Methyl-2-pentanone	ND	10	1,2,4-Trichlorobenzene	ND	5
Toluene	ND	5	Hexachlorobutadiene	ND	5
2-Hexanone	ND	10	1,2,3-Trichlorobenzene	ND	5
			Naphthalene	ND	5
	Amount			Amount	
<u>Surrogate</u>	Recovered	% Recovery		Recovered	% Recovery
Dibromofluoromethane	50.0	100	Toluene-D8	50.8	102
Dichloroethane-D4	54.2	108	Bromofluorobenzene	49.1	98.2

TABLE 11

LABORATORY CONTROL SAMPLE RESULTS

Project ID: COR003

Sample ID: Water LCS Client Project ID: ROAN EPA Method 8260B

Units: ug/L

Spike Amount: 100 ug/L

Date Sampled: NA Date Received: NA Date Analyzed: 8/29/08 Sample Matrix: Water

	Amount	%		Amount	%
<u>Analyte</u>	Recovered	Recovery	<u>Analyte</u>	Recovered	Recovery
Dichlorodifluoromethane	ND	NA	trans-1,3-Dichloropropene	ND	NA
Chloromethane	ND	NA	1,1,2-Trichloroethane	ND	NA
Vinyl Chloride	ND	NA	Tetrachloroethene	ND	NA
Bromomethane	ND	NA	Dibromochloromethane	ND	NA
Chloroethane	ND	NA	1,2-Dibromoethane	ND	NA
Trichlorofluoromethane	ND	NA	Chlorobenzene	93.8	93.8
Acetone	ND	NA	1,1,1,2-Tetrachloroethane	ND	NA
1,1-Dichloroethene	89.8	89.8	Ethylbenzene	ND	NA
Carbon Disulfide	ND	NA	Total Xylene	ND	NA
Methylene Chloride	ND	NA	Styrene	ND	NA
Acrylonitrile	ND	NA	Isopropylbenzene	ND	NA
Methyl-t-butyl ether	ND	NA	Bromoform	ND	NA
trans-1,2-Dichloroethene	ND	NA	n-Propylbenzene	ND	NA
1,1-Dichloroethane	ND	NA	1,2,3-Trichloropropane	ND	NA
Vinyl acetate	ND	NA	2-Chlorotoluene	ND	NA
2-Butanone	ND	NA	1,3,5-Trimethylbenzene	ND	NA
cis-1,2-Dichloroethene	ND	NA	4-Chlorotoluene	ND	NA
Chloroform	ND	NA	t-Butylbenzene	ND	NA
Tetrahydrofuran	ND	NA	1,2,4-Trimethylbenzene	ND	NA
1,1,1-Trichloroethane	ND	NA	sec-Butylbenzene	ND	NA
Carbon Tetrachloride	ND	NA	p-Isopropyltoluene	ND	NA
Benzene	94.3	94.3	1,1,2,2-Tetrachloroethane	ND	NA
1,2-Dichloroethane	ND	NA	1,3-Dichlorobenzene	ND	NA
Trichloroethene	94.3	94.3	1,4-Dichlorobenzene	ND	NA
1,2-Dichloropropane	ND	NA	n-Butylbenzene	ND	NA
Dibromomethane	ND	NA	1,2 Dichlorobenzene	ND	NA
Bromodichloromethane	ND	NA	1,2-Dibromo-3-chloropropane	ND	NA
cis-1,3-Dichloropropene	ND	NA	1,2,4-Trichlorobenzene	ND	NA
4-Methyl-2-pentanone	ND	NA	Hexachlorobutadiene	ND	NA
Toluene	95.9	95.9	1,2,3-Trichlorobenzene	ND	NA
2-Hexanone	ND	NA	Naphthalene	ND	NA
	Amount			Amount	
<u>Surrogate</u>	Recovered	% Recovery	<u>/ Surrogate</u>	Recovered	% Recovery
Dibromofluoromethane	45.5	91.0	Toluene-D8	52.9	106
Dichloroethane-D4	49.3	98.6	Bromofluorobenzene	48.3	96.6

TABLE 12 (Page 1 of 2) MATRIX SPIKE RESULTS Project ID: COR003

Client Sample ID: D-10 Client Project ID: ROAN EPA Method 8260B

Units: ug/L

Spike Amount: 100 ug/L

Date Sampled: 8/28/08 Date Received: 8/28/08 Date Analyzed: 8/29/08 Sample Matrix: Water

Spike Amount: 100 ug/L					
	Amount	%		Amount	%
<u>Analyte</u>	Recovered	Recovery	<u>Analyte</u>	Recovered	Recovery
Dichlorodifluoromethane	ND	NA	trans-1,3-Dichloropropene	ND	NA
Chloromethane	ND	NA	1,1,2-Trichloroethane	ND	NA
Vinyl Chloride	ND	NA	Tetrachloroethene	ND	NA
Bromomethane	ND	NA	Dibromochloromethane	ND	NA
Chloroethane	ND	NA	1,2-Dibromoethane	ND	NA
Trichlorofluoromethane	ND	NA	Chlorobenzene	99.0	99.0
Acetone	ND	NA	1,1,1,2-Tetrachloroethane	ND	NA
1,1-Dichloroethene	96.0	96.0	Ethylbenzene	5.9	NA
Carbon Disulfide	ND	NA	Total Xylene	33	NA
Methylene Chloride	ND	NA	Styrene	ND	NA
Acrylonitrile	ND	NA	Isopropylbenzene	ND	NA
Methyl-t-butyl ether	ND	NA	Bromoform	ND	NA
trans-1,2-Dichloroethene	ND	NA	n-Propylbenzene	ND	NA
1,1-Dichloroethane	ND	NA	1,2,3-Trichloropropane	ND	NA
Vinyl acetate	ND	NA	2-Chlorotoluene	ND	NA
2-Butanone	ND	NA	1,3,5-Trimethylbenzene	17	NA
cis-1,2-Dichloroethene	ND	NA	4-Chlorotoluene	ND	NA
Chloroform	ND	NA	t-Butylbenzene	ND	NA
Tetrahydrofuran	ND	NA	1,2,4-Trimethylbenzene	30	NA
1,1,1-Trichloroethane	ND	NA	sec-Butylbenzene	ND	NA
Carbon Tetrachloride	ND	NA	p-Isopropyltoluene	ND	NA
Benzene	126	97.0	1,1,2,2-Tetrachloroethane	ND	NA
1,2-Dichloroethane	ND	NA	1,3-Dichlorobenzene	ND	NA
Trichloroethene	98.7	98.7	1,4-Dichlorobenzene	ND	NA
1,2-Dichloropropane	ND	NA	n-Butylbenzene	ND	NA
Dibromomethane	ND	NA	1,2 Dichlorobenzene	ND	NA
Bromodichloromethane	ND	NA	1,2-Dibromo-3-chloropropane	ND	NA
cis-1,3-Dichloropropene	ND	NA	1,2,4-Trichlorobenzene	ND	NA
4-Methyl-2-pentanone	ND	NA	Hexachlorobutadiene	ND	NA
Toluene	99.1	99.1	1,2,3-Trichlorobenzene	ND	NA
2-Hexanone	ND	NA	Naphthalene	11	NA
	Amount			Amount	
<u>Surrogate</u>	Recovered	% Recovery	<u>Surrogate</u>	Recovered	% Recovery
Dibromofluoromethane	49.4	98.8	Toluene-D8	49.8	100
Dichloroethane-D4	49.0	98.0	Bromofluorobenzene	49.2	98.4

TABLE 12 (Page 2 of 2) MATRIX SPIKE DUPLICATE RESULTS Project ID: COR003

Client Sample ID: D-10 Client Project ID: ROAN EPA Method 8260B

Units: ug/L

Spike Amount: 100 ug/L

Date Sampled: 8/28/08 Date Received: 8/28/08 Date Analyzed: 8/30/08 Sample Matrix: Water

Spike Amount: 100 ug/L							
	Amount	%			Amount	%	
<u>Analyte</u>	Recovered	Recovery	<u>RPD</u>	<u>Analyte</u>	Recovered	Recovery	<u>RPD</u>
Dichlorodifluoromethane	ND	NA	NA	trans-1,3-Dichloropropene	ND	NA	NA
Chloromethane	ND	NA	NA	1,1,2-Trichloroethane	ND	NA	NA
Vinyl Chloride	ND	NA	NA	Tetrachloroethene	ND	NA	NA
Bromomethane	ND	NA	NA	Dibromochloromethane	ND	NA	NA
Chloroethane	ND	NA	NA	1,2-Dibromoethane	ND	NA	NA
Trichlorofluoromethane	ND	NA	NA	Chlorobenzene	98.6	98.6	0.4
Acetone	ND	NA	NA	1,1,1,2-Tetrachloroethane	ND	NA	NA
1,1-Dichloroethene	103	103	7.0	Ethylbenzene	5.5	NA	NA
Carbon Disulfide	ND	NA	NA	Total Xylene	33	NA	NA
Methylene Chloride	ND	NA	NA	Styrene	ND	NA	NA
Acrylonitrile	ND	NA	NA	Isopropylbenzene	ND	NA	NA
Methyl-t-butyl ether	ND	NA	NA	Bromoform	ND	NA	NA
trans-1,2-Dichloroethene	ND	NA	NA	n-Propylbenzene	ND	NA	NA
1,1-Dichloroethane	ND	NA	NA	1,2,3-Trichloropropane	ND	NA	NA
Vinyl acetate	ND	NA	NA	2-Chlorotoluene	ND	NA	NA
2-Butanone	ND	NA	NA	1,3,5-Trimethylbenzene	16	NA	NA
cis-1,2-Dichloroethene	ND	NA	NA	4-Chlorotoluene	ND	NA	NA
Chloroform	ND	NA	NA	t-Butylbenzene	ND	NA	NA
Tetrahydrofuran	ND	NA	NA	1,2,4-Trimethylbenzene	28	NA	NA
1,1,1-Trichloroethane	ND	NA	NA	sec-Butylbenzene	ND	NA	NA
Carbon Tetrachloride	ND	NA	NA	p-Isopropyltoluene	ND	NA	NA
Benzene	127	98.0	8.0	1,1,2,2-Tetrachloroethane	ND	NA	NA
1,2-Dichloroethane	ND	NA	NA	1,3-Dichlorobenzene	ND	NA	NA
Trichloroethene	101	101	2.3	1,4-Dichlorobenzene	ND	NA	NA
1,2-Dichloropropane	ND	NA	NA	n-Butylbenzene	ND	NA	NA
Dibromomethane	ND	NA	NA	1,2 Dichlorobenzene	ND	NA	NA
Bromodichloromethane	ND	NA	NA	1,2-Dibromo-3-chloropropane	ND	NA	NA
cis-1,3-Dichloropropene	ND	NA	NA	1,2,4-Trichlorobenzene	ND	NA	NA
4-Methyl-2-pentanone	ND	NA	NA	Hexachlorobutadiene	ND	NA	NA
Toluene	107	107	7.7	1,2,3-Trichlorobenzene	ND	NA	NA
2-Hexanone	ND	NA	NA	Naphthalene	11	NA	NA
	Amount	%			Amount	%	
<u>Surrogate</u>	Recovered	Recovery		<u>Surrogate</u>	Recovered	Recovery	
Dibromofluoromethane	49.8	99.6		Toluene-D8	53.9	108	
Dichloroethane-D4	51.4	103		Bromofluorobenzene	48.5	97.0	

NA = Not Analyzed