Clean Harbors Deer Trail LLC

Approved by:	General Manager	Radiation Safety Officer

Groundwater Sampling Standard Operating Procedure 15.Env.2

1.0 **Objective:** To establish groundwater sampling and analysis procedures that will provide quality data for evaluation of waste treatment and disposal unit integrity and environmental quality. The plan is consistent with and will run concurrently with the groundwater-monitoring program defined in the State RCRA Permit.

2.0 **Scope:** This procedure applies to all environmental monitoring samples collected from the groundwater monitoring wells and the secure cell leachate collection system, leak detection system and permanent sumps as well as the leak detection system in the treatment building.

3.0 **Policy:** All Deer Trail activities that could result in discharges of regulated waste to groundwater or effluents are subject to the groundwater-monitoring program.

4.0 **Responsibilities:** Responsibilities of the Deer Trail Radiation Safety Officer (RSO), the facility Compliance Manager, other management and staff are defined in the Deer Trail Radiation Safety Plan.

5.0 **Groundwater Sampling Procedures**

5.1 Container Preparation

5.1.1 The containers will be constructed of a material compatible and non-reactive with the expected sample aliquots. Consult Section 6.0, Table 4.0, Recommended Sample Handling, Preservation, and Instrumentation, to determine the number, type and volume of containers needed. Metal lids should not be utilized. Plastic lids with polyethylene or Teflon liners are acceptable in most cases.

5.1.2 Individual aliquot containers are not required for each determination or test. If two or more tests require the same container and preservation, and a container of sufficient size is available, the sample aliquots may be combined.

5.1.3 Generally the analytical laboratory will supply the sample containers. The laboratory will clean the containers before shipment to the Facility in accordance with the laboratory's quality assurance program. The Laboratory will provide documentation certifying the containers to be analyte-free. Alternatively, the laboratory may provide sample containers that have been purchased from a vendor, provided the vendor can provide documentation certifying the containers to be analyte-free. If the Laboratory and/or vendor do not supply sample containers the containers shall be cleaned in accordance with Section 5.6.

5.1.4 If the sample locations and tests are known prior to collection, the container labels may be partially completed and the chemical preservatives added to the containers (where applicable) before sampling.

Title: Groundwater Sampling SOP dated 8/1/06
Ref: CHDT, 1102-01, 4.2

5.1.5 The Laboratory will generally supply sample shuttle kits (each) consisting of an insulated cooler, pre-cleaned containers, labels, seals, and Chain-of-Custody, field log, and shipping forms. The sampling crew will supply refrigerant at the time of sampling.

5.2 Well Inspection

The monitoring wells shall be inspected prior to each groundwater-sampling event. During the well inspection, water levels will be measured to determine which wells contain water and which wells are dry. The depth to water, if any, and total well depth shall be measured during the inspection. These data will be recorded on the form provided in Section 7.0. Personnel will also note well conditions, as appropriate, on this form.

5.3 Well Evacuation

Prior to purging the well in preparation for sampling, the groundwater personnel will perform the following tasks:

- Measure depth to water and total well depth.

The procedures to perform these tasks are described in Section 5.4.

6 CCR 1007-3 264.97 (a)(2) requires that groundwater samples must represent the quality of water passing the point of compliance to ensure that the water sampled is not stagnant and therefore representative of the surrounding groundwater conditions. To meet this requirement, the following protocol shall be followed for purging or evacuating wells:

5.3.1 Rapidly recovering wells are defined as those wells, which recover at least 90% of one well volume in less than 12 hours.

- Rapidly recovering wells shall have approximately three well volumes removed prior to sampling.
- Sampling of these wells shall be completed within 24 hours from the time that the last well volume is purged.

5.3.2 Low yield or slowly recovering wells are those wells, which take longer than 12 hours but less than 48 hours to recover at least 90% of one well volume of water. Sampling of low yield wells will be following the Ground water Sampling Procedure for Low Stress (Low Flow) Purging and Sampling Procedure contained in Section 8.0.

- Low yield wells shall be totally evacuated (to the extent practicable) only one time prior to sampling.
- Sampling of these wells shall be completed within 48 hours of the well evacuation.

5.3.3 Dry wells are defined as a well, which has not recovered at least 90 percent of a well volume within 48 hours. These wells shall not be sampled.

5.3.4 During each sampling event each previously dry well shall have been checked during the well inspection procedure to determine if water is present in the well. If water is present it shall be purged as described above.

5.3.5 During the first sampling event all inspection and detection monitoring wells shall be classified as a rapidly recovering, low yield or no-yield well.

The first sampling event classifications and measurement of well recovery data shall be recorded on the form in Section 7.0. The form presents a protocol for classifying the wells relative to recovery. The results of this well recovery classification shall be included in the Monitoring Report.

During the second sampling event each well will be evacuated and sampled in accordance with the procedures applicable to that well's recovery classification, which was determined in the first sampling event. Well evacuation procedures and data for those quarterly events will be recorded on the form presented in Section 7.0.

5.3.6 In order to prevent well contamination, one of the following well purging procedures will be utilized:

5.3.7 A dedicated bailer, constructed of the same material as the well casing, Teflon, or stainless steel, attached to the reel with a single strand of stainless steel wire or a monofilament line, shall be used. If necessary, the reel will be mounted on a tripod and set directly above the well opening. The bailer and cable should only contact the internal well casing. The reel's monofilament line will be wiped with a clean towel moistened with de-ionized water as the bailer line is retrieved. As the last bailer-full is pulled, the cable will be wiped away from the well casing opening with a freshly prepared reagent grade methanol/D.I. water saturated cloth. Care must be exercised not to permit excessive methanol/water to drop into the well, possibly resulting in contamination of the well. Well water will be evacuated from the uppermost part of the water column to assure that fresh water moves upward from the screen.

5.3.8 A dedicated system composed of either an electrically powered submersible pump, a gas operated positive displacement (bladder or piston) pump, or a gas lift purge pump may be used. The pump intake will be located approximately a foot above the bottom of the screened area to minimize the potential for electrically powered submersible pumps to burnout upon total evacuation. Electrically powered submersible pumps will not be operated when the water level in the well drops below the pump intake.

5.3.9 If non-dedicated equipment is used in well purging, that equipment will be cleaned before evacuating each well. The equipment shall be cleaned and stored per the procedures outline in Section 5.6. (Note: All groundwater wells at the Deer Trail Facility, except the dry wells, utilize dedicated purging and sampling equipment.)

5.3.10 All dedicated bailers will be inspected at the time of well purging for cleanliness and functionality.

5.3.11 All dedicated equipment temporarily removed from its well for repair (i.e. Maintenance Building or Off-site) shall be decontaminated as described in Section 5.6. Equipment blank samples shall be taken on all dedicated equipment that has been temporarily removed from the well for repairs in Maintenance Building or Off-site and after it has been decontaminated.

5.3.12 All purge water shall be collected in a calibrated container to determine evacuation rate and volume. Well water not used for sampling will be transferred to a central collection point (portable collection tanks), and evaluated for proper wastewater management.

5.4 Field Records (Evacuation)

A separate evacuation field log for each well shall be maintained to record all pertinent information regarding the evacuation and sampling of monitor wells. Sample forms are presented in Section 7.0. The form will be utilized during the first sampling event for classifying wells according to their recovery characteristics. The form in Section 7.0 will be utilized for all other sampling events. This recorded information is necessary to maintain well sampling data and becomes part of the analytical report. The sample collector shall sign and date each page of the field log (see Section 7.0). The following data shall be determined and recorded upon the evacuation of each well:

- Sample collector's name, date and time that evacuation was initiated and completed.
- Site and Location
- Event and Year
- Well Identification - i.e., monitor well number, code or name.
- Well Depth - Measure from a marked reference point at the top of the casing to the bottom of the well to the nearest 0.01 foot with a clean weighted measuring tape or a calibrated water level indicator. The tape or water level indicator shall be wiped with a clean cloth saturated with reagent grade methanol and de-ionized water following each measurement of well depth. Wells with dedicated pumps will be re-developed at a minimum once a year during the second quarter, or at any time should excessive silting occur. Well depth will be measured after re-development and recorded on the sampling log.
- Water Level Depth - Measure from the marked reference point at the top of the well casing to the water surface to the nearest 0.01-foot with a calibrated water level indicator. The water level indicator shall be calibrated and any correction factors noted on the meter, and the factor, if any, will be applied to the water level depth measurements. Each well shall have a marked measurement reference point at the top of the casing from which its water level is taken. An elevation/location reference point shall be established in relation to mean sea level by a licensed surveyor for each well, the marker is typically located on the concrete well pad. The reference point shall be established in relation to mean sea level and the survey shall also note the well location coordinates.
- Measure and record well casing inside diameter to the nearest 0.1 inch.
- Record total gallons evacuated - Well yield

- Record water level (in feet) following evacuation.
- Record method of evacuation - type of bailer, pump, etc.
- Comments - Any deviation from standard sampling procedures, unusual conditions, damage or problems encountered at each well should be recorded completely, clearly and concisely.

5.5 Sampling the Monitor Wells

After the wells have been evacuated, the containers and sampling equipment shall be prepared and the initial log data entered. Those wells that meet the recovery criteria specified in Section 5.3 shall be sampled as follows:

5.5.1 Re-measure the water level depth to the nearest 0.01-foot and record on the field sampling log (Section 7.0).

5.5.2 All non-dedicated equipment used to sample the well (e.g., bailer, funnel, etc.) must be cleaned and stored per the procedures outlined in Section 5.6.

5.5.3 During the normal course of sampling equipment blanks will not be taken from wells utilizing dedicated sampling equipment. If the dedicated equipment is removed from the well for any reason other than the normal course of sampling or well purging, then the equipment will be decontaminated and an equipment blank will be collected from the final rinse of the decontamination process which was performed in accordance with Section 5.6.

5.5.4 If the well is equipped with a dedicated submersible pump, it will be used to sample the well. Wells shall be sampled within the time periods specified in Section 5.3.

5.5.5 Wells not equipped with a pump system will be sampled utilizing a bailer. The bailers will be constructed of stainless steel, Teflon or of the same material as the well casing, attached to a reel with a clean single strand stainless steel wire or a monofilament line. The reel will be mounted on a tripod if necessary and set directly above the well opening. Except as specified in Section 5.3.7 the first bailer-full collected shall be used to rinse the bailer and managed as described in paragraph 5.3.12. If the well has recharged sufficiently to collect all samples required. If the well contains insufficient water to generate the necessary aliquots, then the first bailer-full may be used to collect the sample, rather than discarding it as rinse water. Samples will be transferred, with as little agitation as possible, from the bailer to the sample containers and immediately preserved according to the specific test requirements. Upon withdrawing the last bailer-full, the cable will be wiped away from the well casing opening with a fresh clean cloth saturated with deionized water and reagent grade methanol. Care must be taken not to allow any excess methanol/water mixture to enter the well.

5.5.6 All samples collected for transport to the Laboratory shall be chemically preserved (if applicable). See Section 6.0, Table 4.0, for specific requirements.

5.5.7 The following determinations will be made in the field at the time of sampling and recorded on the field logs:

- pH
- Specific Conductance
- Temperature
- Calibration checks
- Turbidity

Field monitoring instruments including pH, specific conductance, and turbidity meters, shall be calibrated each day of sample collection prior to sampling. In addition, the calibration of these instruments shall be verified using certified standards prior to the sampling of each well. All calibration verifications will be recorded in the designated logbook.

5.5.8 Sample Shipment - Samples will be shipped in sealed insulated shipping containers, ice chests or coolers supplied by the analytical laboratory conducting the analyses. Shipment and receipt of samples must be coordinated with the laboratory to minimize time in transit. To insure arrival at the laboratory in good condition, the samples will be sent in sturdy insulated ice chests (coolers). An air courier or equivalent overnight courier service will be utilized, if necessary.

5.5.9 One well field duplicate will be obtained for 20 wells (batch) in each scheduled sampling event. Duplicated sampling of wells will be determined by the random sampling method discussed in Appendix 8 of this plan. Only those wells that have traditionally produced a sufficient volume of water to fill a complete Background Parameters (Groundwater Protection Program Table 2.0) or Detection Monitoring (Groundwater Protection Program Table 3.0) bottle set will be included as potential duplicate well candidates. Duplicate sample aliquots (except for volatile analysis samples) will be collected in quarter-bottle increments to ensure inter-sample homogeneity.

5.6 Decontamination of Non-Dedicated Evacuation and Sampling Equipment and Non-Laboratory Supplied Sampling Equipment

The cleanliness of the containers, evacuating and sampling equipment is most important.

5.6.1 Bottles and lids to contain samples must be hand washed with a liquid hand dishwashing detergent, rinsed in hot tap water, rinsed with chemically pure or reagent grade nitric acid, rinsed at least four times with tap water and four times with distilled or deionized water and allowed to air dry.

5.6.2 Glass bottles used to collect samples for analysis shall be washed with a liquid hand dishwashing detergent, rinsed with hot tap water, rinsed with reagent grade methanol, finished with D.I. water (at least six rinses), and kiln baked at 300° C. Caps and teflon liners, shall be prepared in the same manner, except without the kiln bake. When the bottles are cool and the caps and liners are completely dry, cap the bottles and store them in a clean and dry environment.

5.6.3 All non-dedicated equipment used to bail or sample a well must be cleaned in the same manner prescribed for cleaning the bottles and lids for conventional analysis described in

A. above, and stored in a clean and dry environment. Clean bailers must be wrapped in new aluminum foil with the bright side out, or high-grade paper for storage.

5.7 Field Records (Sampling)

5.7.1 It is most important to maintain an accurate and thorough field log in case one is required to recall particular detailed information concerning the evacuation and sampling of a monitor well. As mentioned earlier, these logs become part of the analytical report. In addition to the information recorded during the purging process, the following information will be also be recorded on the field log at the time of sampling:

- Sample collector's name, date and time of sampling.
- Water Level Depth - Measure from the reference point at the top of casing to the water surface to the nearest 0.01-foot with a calibrated water level indicator.
- Reason for sampling - e.g., semi-annual sampling, special problem
- Initiator requesting the well sampling.
- Sample identification number for each set of samples taken from a single sample source.
- Sample pH, specific conductance, temperature, turbidity, and calibration documentation.
- Method of sample collection - type of bailer, pump, etc.
- Sample characteristics such as color, odor, sediment, surface oil, etc.
- Sample volume, containers, and preservatives.
- Test to be performed on each sample (if known).
- The weather conditions at the time of sampling.
- Sample sequence number - Order in which well was sampled with respect to other wells onsite. If more than one sampler or sampling team are participating in the sampling event, each sampler or team shall record the sequence or order in which each well was sampled with respect to the other wells they have sampled.
- Any additional field observations, comments or recommendations - e.g., split sampling (with whom), re-sampling, equipment failures, condition of the well, etc.
- Sample Custody Statement - If the samples are transferred to the receiving laboratory by the collector and are in his or her possession at all times, a statement to this effect shall be noted.

5.7.2 The samples must be sealed to protect their value. If the sample shuttle kit (cooler) does not employ a tamper proof seal, the collector is to date, sign and identify each sample on a seal and attach it to each sample container and lid. A waterproof adhesive seal and pen must be used.

5.7.3 Prepare a sample label for each sample container employing a waterproof pen and adhesive label. The following is to be indicated on the label -

- Collector's name, date and time of sampling.
- Sample source.
- Sample identification number.
- Sample preservatives.
- Test(s) to be performed on the sample, if known.

5.8 Chain-of-Custody

Chain-of-Custody records will be used to insure the integrity of the sampling event and the analyses.

5.8.1 The sample collector will complete a Chain-of-Custody record (Section 7.0 or equivalent) for all monitoring well samples.

5.8.2 The sample collector will retain a copy of the Chain-of-Custody record, and forward the original with the sample to the laboratory performing the analyses.

5.8.3 Upon receipt of the samples, the laboratory manager or representative will complete the Chain-of-Custody record, make a copy for his or her files, and return the original with the analytical data.

5.9 Instructions to the Laboratory

The results of the analysis of the blanks should not be used to correct the ground water data. If contaminants are found in the blanks, the source of the contamination must be identified and corrective action, including re-sampling, must be initiated. Other quality control samples (e.g., standards, spikes, performance evaluation samples) must be prepared and analyzed as part of the laboratory operation.

5.10 Laboratory Requirements

The laboratory shall have the capabilities to analyze for most monitor well parameters. Some samples submitted to the laboratory for analysis may be subcontracted to another independent commercial laboratory. Any samples submitted to the Lab must be properly preserved, accompanied with completed Chain-of-Custody records. If an independent, subcontracted laboratory is utilized, the procedures recommended for sample preservation will be followed, Chain-of-Custody records, and a completed Sample Analysis Request form will accompany the samples.

5.10.1 Laboratory: Laboratory QA/QC plan applicable to the Groundwater Analysis performed by CHDT will be in accordance with the facilities approved QA/QC plan and standard operating procedures. These standard operating procedures will include, but are not limited to, the following:

- The use of Standard Reference Materials, intra-laboratory samples, laboratory blanks, duplicate and spike samples for calibration and matrix interference identification.
- Statistical procedures and accuracy control charts to monitor and document laboratory performance and define analysis acceptance criteria.
- Programs for instrument calibration and maintenance control.
- Sample receipt and documentation.

5.10.2 Outside Laboratory – CHDT will submit to the Department a QA/QC plan or verification of independent laboratory certification for each outside laboratory contracted to perform groundwater analysis.

5.11 Analytical Parameters

The analytical parameters to be analyzed for in groundwater samples collected at the facility are given in Section 6.0 - Tables 2.0 and 3.0. Listed are each parameter, their respective analytical methods and levels of Reporting Detection Limits and if they are background or detection monitoring parameters, or both. The parameters pH, specific conductance and turbidity will be determined in the field.

6.0 Tables

6.1 Table 1.0 – Frequency of Data Collection and Evaluation
6.2 Table 2.0 – Background Monitoring Parameters
6.3 Table 3.0 – Detection Monitoring Parameters
6.4 Table 4.0 – Sample Handling, preservation, and Instrumentation

7.0 Forms

7.1 Monitoring Well Field Log – Sampling
7.2 Monitoring Well Field Log – Evacuation and Recovery Classification (1st event)
7.3 Monitoring Well Field Log – Evacuation and Recovery Classification (2nd event)
7.4 Sample Chain –of – Custody

8.0 Groundwater Sampling Procedure for Low Stress (Low Flow) Purging and Sampling Procedure, U.S. EPA Region II, March 16, 1998

Section 6.0 Tables

TABLE - 1.0
Frequency of Data Collection and Evaluation

Monitoring Location	Monitoring Program	Data Collection Frequency		Data Evaluation Frequency		
		Hydraulic Measurements	Sampling and Lab Analysis (if appropriate)	Descriptive Statistics	Comparative Statistics	Trend Analyses
Closed Secure Cell LCS	Secure Cell Performance Monitoring	Weekly	Annually	NA	NA	NA
Active Secure Cell LCS	Secure Cell Performance Monitoring	Weekly	Quarterly	NA	NA	NA
Secure Cell LDS	Secure Cell Performance Monitoring	Weekly	Semiannually	NA	NA	NA
Secure Cell Permanent Sump	Secure Cell Performance Monitoring	Weekly	Semiannually	NA	NA	NA
Treatment Building LDS	Surface Impoundment Performance Monitoring	Weekly	Semiannually	NA	NA	NA
Level 3 Wells	Inspection Monitoring	Quarterly	Semiannually	Semiannually	Semiannually	Semiannually
Level 4A Wells	Detection Monitoring	Quarterly	Semiannually	Semiannually	Semiannually	Semiannually
Level 4 Wells	Detection Monitoring	Quarterly	Semiannually	Semiannually	Semiannually	Semiannually
Level 5 Wells	Detection Monitoring	Quarterly	Semiannually	Semiannually	Semiannually	Semiannually
Level 6 Wells	Inspection Monitoring	Quarterly	Semiannually	Semiannually	Semiannually	Semiannually

TABLE 2.0
Background Monitoring Parameters

ANALYTE	Instrumentation [1]	GW Reporting Limit (pCi/L)	CDPHE Groundwater Standard (pCi/L)
RADIOACTIVITY			
Gross Alpha	A, B, or G	3.0	15 (excludes U and Rn)
Gross Beta	A or G	4.0	
Lead-210	E	3.0	
Thorium-228	H	1.0	
Thorium-230 and 232	H	1.0	60
Uranium-234	H	1.0	30 (ug/l) (Total)
Uranium-235	H	1.0	See above
Uranium-238	H	1.0	See above
Radium-226 and 228	A, B, D, or G	1.0	5.0
H-3 (Tritium)	E	500	20,000
C-14	E	20	
K-40	C	250	
Co-60	C	30	
Cs-137	C	20	80 (as Cs-134)
Sr-90	A or G	3.0	8.0
Pu-238	E or H	0.1	
Pu-239	E or H	0.1	0.15 (Pu-239 and Pu240)
Pu-241	E or H	5.0	
Am-241	H	0.1	0.15

[1] A = Low background proportional system; B = Alpha and beta scintillation system; C = Gamma spectrometer [Ge(Hp) or Ge(Li)]; D = Scintillation cell system; E = Liquid scintillation system; F = Fluorometer; G = Low background alpha and beta counting system other than gas-flow proportional; H=Alpha spectrometry system.

TABLES 3.0
Detection Monitoring Parameters

ANALYTE	Instrumentation [1]	GW Reporting Limit	CDPHE Groundwater Standard
RADIOACTIVITY			
Gross Alpha	A, B, or G	3.0 (pCi/L)	15 (pCi/L) (excludes U and Rn)
Gross Beta	A or G	4.0 (pCi/L)	50 (pCi/L) (screening level)
Uranium-Total	F	1.0 (ug/l)	30 (ug/l) (Total)
Radium-226 and 228	A, B, D, or G	1.0 (pCi/L)	5.0 (pCi/L) (combined)

[1] A = Low background proportional system; B = Alpha and beta scintillation system; C = Gamma spectrometer [Ge(Hp) or Ge(Li)]; D = Scintillation cell system; E = Liquid scintillation system; F = Fluorometer; G = Low background alpha and beta counting system other than gas-flow proportional; H=Alpha spectrometry system.

Table 4.0
Sample Handling, Preservation, and Instrumentation

Parameter	Preservative [1]	Container [2]	Maximum Holding Time[3]	Instrumentation[4]
Gross Alpha	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A, B, or G
Gross beta	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A or G
Strontium-89	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A or G
Strontium-90	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A or G
Radium-226	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A, B, D or G
Radium-228	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A or G
Cesium-134	Conc. HCl to pH <2[5]	P or G	6 mo	A, C or G
Iodine-131	None	P or G	8 da	A, C or G
Tritium	None	G	6 mo	E
Uranium	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	A, B, F, H
Photon emitters	Conc. HCl or HNO_3 to pH <2[5]	P or G	6 mo	C

[1] It is recommended that the preservative be added to the sample at the time of collection unless suspended solids activity is to be measured. If the sample has to be shipped to a laboratory or storage area unpreserved, acidification of the sample (in its original container) may be delayed for a period not to exceed 5 days. A minimum of 16 hours must elapse between acidification and analysis.

[2] P = Plastic, hard or soft; G = Glass, hard or soft.

[3] Holding time is defined as the period from time of sampling to time of analysis. In all cases, samples should be analyzed as soon after collection as possible. If a composite sample is prepared, a holding time cannot exceed 12 months.

[4] A = Low background proportional system; B = Alpha and beta scintillation system; C = Gamma spectrometer [Ge(Hp) or Ge(Li)]; D = Scintillation cell system; E = Liquid scintillation system; F = Fluorometer; G = Low background alpha and beta counting system other than gas-flow proportional; H=Alpha spectrometry system.

[5] If HCl is used to acidify samples, which are to be, analyzed for gross alpha or gross beta activities, the acid salts must be converted to nitrate salts before transfer of the samples to planchets.

Section 7.0 Forms

EAN HARBORS (DEER TRAIL), LLC.
MONITORING WELL FIELD LOG - SAMPLING

Event #_____ Year_____

Well Identification_____

SAMPLING:

Date_____Time_____

Collector/Operator_____

Sample Sequence_____

Water Level Depth, Ft._____

Method of Collection_____

Method of Filtration_____

Completed(date)_____(time)_____

Reason for Sampling_____

*Field Sample Analysis

Analysis	Instrumentation	Calibration Information		Sample Values
Specific Conductance @25°C (μmhos/cm)		std.	det.	
pH (S.U.)		std.	det.	
Temperature (°C)				
Turbidity (NTU)		std.	det.	

GENERAL INFORMATION

Weather Conditions at time of sampling: _____

_____

Sample Characteristics _____

_____

Sample Information (Container, volume, preservatives, test): _____

_____

Comments and Observations _____

_____

Temp. of shuttle when shipped:_____Temp. of shuttle when received at Lab_____

Certification: _____

Sample received by Lab: _____

Certification: _____

Sample received by Lab: _____

CI N HARBORS (DEER TRAIL), LLC.

MONITORING WELL FIELD LOG - EVACUATION AND RECOVERY CLASSIFICATION
(to be utilized during First Sampling Event)

Well Identification_____

Event # 1 Year_____ Sample Collector/Operator_____

PRE-EVACUATION:

Organic Vapor Detected (Measured required only if detected during well inspection) ☐ Yes ☐ No ☐ Not Required

Method of Detection_____

Concentration, ppm_____as_____

Calibration, ppm Std._____ppm Det._____

Immiscible Layer Detected ☐ Yes ☐ No

Sample Collected ☐ Yes ☐ No ☐ N/A

Depth (Measured from Casing Reference Point)

to Top of layer(s), Ft._____(to 0.01)

to Bottom of layer, Ft._____(to 0.01)

Method of Sample Collection_____

Sample Reference #_____

EVACUATION:

Method of Evacuation_____

Before Evacuation:

a. Water Level Depth, Ft._____(to 0.01)

b. Well Depth, Ft._____(to 0.01)

c. Inside Well Casing Dia._____(inches)

Calculate Well Volume, Gal.: (Casing 6" Dia.) 1.33 x (b - a) = _____Gallons (A)

(Casing 4" Dia.) 0.65 x (b - a) = _____Gallons (A)

Initial Well Volume:

- Evacuate One Well Volume (to the extent practible)
  Volume evacuated_____gallons Time Completed_____(TI)
- Measure water Level within 12 to 24 hours of initial completed evacuation.
  _____Ft. (0.01) Time of measurement_____
- Calculate recovered well volume_____gallons (B)

Classify Well: (Check applicable box and follow the indicate directions.

☐ Rapid Recover Well: Recorded Well Volume (B) is 90% or more of original Well Volume (A)
If a Rapid Recovery Well, sample within 24 hours.

☐ Low Yield Well: Recorded Well Volume (B) is less than 90% of original Well Volume (A).
Remeasure the water level after 24 hours of initial well evacuation.
_____Ft. (0.01) Time of measurement_____
Remeasure the water level within 48 hours of initial well evacuation.
_____Ft. (0.01) Time of measurement_____

- Calculate recovered well volume_____gallons (B)

Check the applicable box:

☐ The recovered well volume (C) is at least 90% of the initial well volume (A). Sample the well within 48 hours of the initial well evacuation time (TI).

☐ The recovered well volume (C) is less than 90% of the initial well volume (A) do not sample and classify the well as non-recoverable.

C AN HARBORS (DEER TRAIL), LLC.

MONITORING WELL FIELD LOG - EVACUATION AND RECOVERY CLASSIFICATION
(to be utilized during Second Sampling Event)

Well Identification_____

Event #_____ Year_____ Sample Collector/Operator_____

PRE-EVACUATION:

Organic Vapor Detected (Measured required only if detecting during well inspection) ☐ Yes ☐ No ☐ Not Required

Method of Detection_____

Concentration, ppm_____as_____

Calibration, ppm Std._____ppm Det._____

Immiscible Layer Detected ☐ Yes ☐ No

Sample Collected ☐ Yes ☐ No ☐ N/A

Depth (Measured from Casing Reference Point)

to Top of layer(s), Ft._____(to 0.01)

to Bottom of layer, Ft._____(to 0.01)

Method of Sample Collection_____

Sample Reference #_____

EVACUATION:

Method of Evacuation_____

Before Evacuation:

a. Water Level Depth, Ft._____(to 0.01)

b. Well Depth, Ft._____(to 0.01)

c. Inside Well Casing Dia._____(inches)

Calculate Well Volume, Gal.: (Casing 6" Dia.) 1.33 x (b - a) = _____Gallons (A)

(Casing 4" Dia.) 0.65 x (b - a) = _____Gallons (A)

For Rapid Yield Well: Evacuate completely (to the extent practical) three times prior to sampling.

Evacuation:

Volume evacuated_____gallons Time Completed_____

Sample within 24 hours.

For Low Yield Well: Evacuate completely (to the extent practical).

One time:

Volume evacuated_____gallons Time Completed_____(A)

Sample within 48 hours of time (A).

Paragon Analytics
A Division of DataChem Laboratories, Inc.

225 Commerce Drive Fort Collins, CO 80524
800-443-1511 or (970) 490-1511 (970) 490-1522 Fax

Accession Number (LAB ID) _____

Chain-of-Custody

Date _____ Page ___ of ___

Originator: Retain pink copy!

Project Name/No.: _____ **Sampler(s):** _____ Turnaround (circle one): **Standard** or **Rush (Due** _____ **)** Dispose: **Date** _____ or **Return to Client**

Report To:
Phone:
Fax:
E-mail:
Company:
Address:

Circle method (right); provide additional information as needed (comments).

Sample ID	Date	Time *	Lab ID	Matrix	Preservative (indicate type)	No. of Containers	VOCs SW8260B E624 E524.2	BTEX (only) SW8021B	SVOCs SW8270C E625	OC Pesticides SW8081A E608	PCBs SW8082 E608	Herbicides SW8151A	Explosives SW8330	TCLP Organics SW1311 SW8260B 8270C 8081A 8151A	TCLP Metals SW1311 SW6010B SW7471	Total Metals by ICP SW6010B 7470 7471 E200 ILMO__	Dissolved Metals by ICP SW6010B 7470 E200 ILMO__	Total Metals by ICP/MS SW6020 E200.8 ILMO__	Dissolved Metals by ICP/MS SW6020 E200.8 ILMO__	Hexavalent Chromium SW7196A Alkaline Digest? Y / N	Inorganic Anions SW9056 E300.0 (specify in comments)	Solids: Total E160.3 TDS E160.1 TSS E160.2	pH SW9040B SW9045C	TPH GRO DRO SW8015B (both)	Gross Alpha / Beta SW9310 E900.0	Actinides by Paragon SOP Pu / U / Am / Th / Cm / ___	Tritium E906.0	Total Alpha-Emitting Radium SW9315 E903.0	Radium 226 E903.1 Radium 228 SW9320 E904.0	Strontium 89 D5811-00 Strontium 90 D5811-00	Gamma Isotopes E901.1					

* Time Zone: EST CST MST PST **Matrix Key:** O = oil, S = soil, NS = non-soil solid, W = water, L = liquid, E = extract, F = filter

Comments:

Form 202r5.xls (4/6/04)

Relinquished By: (1)
Signature _____
Printed Name _____
Date _____ Time _____
Company _____

Relinquished By: (2)
Signature _____
Printed Name _____
Date _____ Time _____
Company _____

Received By: (1)
Signature _____
Printed Name _____
Date _____ Time _____
Company _____

Received By: (2)
Signature _____
Printed Name _____
Date _____ Time _____
Company _____