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1. Art

Steve & Loretta Rael, Owner  
S & R Septic  
PO Box 3155  
Rancho de Taos, NM 87557



9590 9402 3786 8032 0506 68

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Steve Rael

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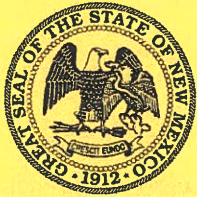
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PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt



NEW MEXICO  
ENVIRONMENT DEPARTMENT



Michelle Lujan Grisham  
Governor

Howie C. Morales  
Lieutenant Governor

Ground Water Quality Bureau  
1190 Saint Francis Drive / PO Box 5469  
Santa Fe, NM 87502-5469  
Phone (505) 827-2900 Fax (505) 827-2965  
[www.env.nm.gov](http://www.env.nm.gov)

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 29, 2019

Steve and Loretta Rael, Owners  
S & R Septic  
PO Box 3155  
Rancho de Taos, NM 87557

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S & R Septic  
PO Box 3155  
Rancho de Taos, NM 87557

Street and City, State

PS Form 3800, April 2015 PSN 7530-02-000-9000

**RE: Draft Discharge Permit Renewal, DP-465, S&R Septic**

Dear Mr. and Mrs. Rael:

Notice is hereby given to Steve and Loretta Rael, pursuant to Subsection H of 20.6.2.3108 NMAC, that Ground Water Discharge Permit Renewal, DP-465, has been proposed for approval (copy enclosed). The New Mexico Environment Department (NMED) will publish notice of the availability of the draft Discharge Permit in the near future and will forward a copy of the notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published in the newspaper for interested parties to submit written comments and/or request a public hearing. Comments and/or hearing requests may be submitted by any interested person, including the Discharge Permit applicant. Written comments and/or hearing requests must be submitted to the Ground Water Quality Bureau at the address above and shall set forth the reasons why a hearing is requested. A hearing will be held only if hearing requests are received from the public and/or the Discharge Permit applicant during the 30-day comment period and NMED determines there is substantial public interest in the proposed Discharge Permit. Hearings are presided over by the NMED Secretary or a hearing officer appointed by the Secretary.

Please review the enclosed draft Discharge Permit carefully. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline.

Please be aware that the New Mexico Water Quality Control Commission (WQCC) has adopted amendments to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC, and these



changes took effect on December 18, 2018. Most significantly several ground water standards changed and new contaminants were added to the list of chemical constituents with protection standards. A table listing the new standards is enclosed for your convenience. You may access the amended regulations on the NMED Ground Water Quality Bureau's webpage under Regulations and Guidance (<https://www.env.nm.gov/gwqb/gw-regulations/>).

If you have any comments, questions, or concerns about the draft Discharge Permit or the public comment period, please contact me at (505) reviewer's phone # or email. If written comments or a written request for hearing are not received during the public comment period, the draft Discharge Permit will become final. Thank you for your cooperation during the review process.

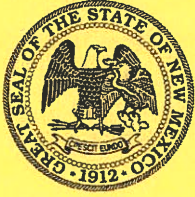
Sincerely,



Jason Herman  
Team Leader

Encl: Draft Discharge Permit Renewal, DP-465  
Draft Discharge Permit Summary  
Table of 20.6.2.3103 Standards for Ground Water  
EPA Soil Sampling SESD Operating Procedure SESDPROC-300-R3





**Michelle Lujan Grisham**  
Governor

**Howie C. Morales**  
Lieutenant Governor

**NEW MEXICO  
ENVIRONMENT DEPARTMENT**

**Ground Water Quality Bureau**

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**James C. Kenney**  
Cabinet Secretary

**Jennifer J. Pruett**  
Deputy Secretary

**GROUND WATER QUALITY BUREAU (GWQB)  
DISCHARGE PERMIT RENEWAL  
Issued under 20.6.2 NMAC**

**Facility Name:** S&R Septic  
**GWQB Discharge Permit Number:** DP-465  
**GWQB TEMPO AI Number:** 2567

**Permittee Name/Responsible Party:** Steve and Loretta Rael  
**Mailing Address:** Box 3155  
Rancho de Taos, NM 87577

**Facility Contact:** Steve Rael  
**Facility Contact Telephone Number:** (575) 770-1001  
**Facility Location:** Tune Drive in Taos, 3 miles west on Hwy 64 from the  
intersection of NM64 and NM522

**County:** Taos

**Permitting Action:** Renewal

**Permit Effective Date:** XXXXXX  
**Permit Expiration Date:** XXXXXXXX

**NMED Permit Contact:** Jason Herman  
**NMED Contact Telephone Number:** (505) 827-2713  
**E-mail Address:** Jason.herman@state.nm.us

\_\_\_\_\_  
**MICHELLE HUNTER**  
Chief, Ground Water Quality Bureau  
New Mexico Environment Department

\_\_\_\_\_  
**Date**



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**GROUND WATER DISCHARGE PERMIT RENEWAL  
S & R Septic, DP-465**

*Draft: April 29, 2019*

**I. INTRODUCTION**

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-465, to Steve and Loretta Rael (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from S & R Septic (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses, and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities that produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows.

Domestic septage and sludge are processed and discharged at the facility in the following ways:

- up to 9,857 gallons per day (gpd) on an average weekly basis, not to exceed a maximum of 69,000 gallons per week, of domestic septage (including portable toilet waste) is discharged to 13 unlined shallow surface disposal cells totaling 2.31 acres on a rotational basis; and
- up to 8,333 gallons per month on an average annual basis, not to exceed a maximum of 100,000 gallons per year, of liquid, semi-solid and solid domestic wastewater treatment facility and/or package treatment plant sludge is discharged to three shallow surface disposal cells totaling 0.46 acres on a rotational basis.
- All waste types are treated by mixing each load with lime to increase the pH above 12.0 for a minimum of 30 minutes prior to discharging into the shallow surface disposal cells.

The facility is located on Tune Drive west of NM Highway 64, approximately three miles northwest of Taos, and projected to be in Section 21, Township 26N, Range 12E, Taos County. Groundwater most likely to be affected has been estimated to be at a depth of greater than 500 feet and have a total dissolved solids concentration of approximately 300-400 milligrams per liter.

The original Discharge Permit was issued on April 7, 1987, and subsequently renewed and/or modified on June 10, 1992, July 28, 1999, May 22, 2003, and December 27, 2012. The application (i.e., discharge plan) consists of the materials submitted by the consultant, William L. Mansker, PhD, on behalf of the permittee, dated February 22, 2018, and materials contained in the



administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of groundwater quality and that more stringent requirements to protect groundwater quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate groundwater quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations or any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit.

Abbreviation	Explanation	Abbreviation	Explanation
BOD <sub>5</sub>	biochemical oxygen demand (5-day)	NMSA	New Mexico Statutes Annotated
CFR	Code of Federal Regulations	NH <sub>3</sub> -N	Ammonia – nitrogen
CFU	Colony Forming Unit	NO <sub>3</sub> -N	nitrate-nitrogen
Cl	chloride	NTU	nephelometric turbidity units
EPA	United States Environmental Protection Agency	TDS	total dissolved solids
gpd	gallons per day	TKN	total Kjeldahl nitrogen
LAA	land application area	total nitrogen	= TKN + NO <sub>3</sub> -N
LADS	land application data sheet(s)	TRC	total residual chlorine
mg/L	milligrams per liter	TSS	total suspended solids
mL	milliliters	WQA	New Mexico Water Quality Act
MPN	Most Probable Number	WQCC	Water Quality Control Commission
NMAC	New Mexico Administrative Code	WWTF	Wastewater Treatment Facility
NMED	New Mexico Environment Department		

## II. FINDINGS

In issuing this Discharge Permit, NMED finds the following.

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.



2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into groundwater of the State of New Mexico that has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.
3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

### III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 9,857 gpd on an average weekly basis, not to exceed a maximum of 69,000 gallons per week, of domestic septage (including portable toilet waste) to 13 unlined shallow surface disposal cells totaling 2.31 acres on a rotational basis.

The permittee is also authorized to discharge up to 8,333 gallons per month on an average annual basis, not to exceed a maximum of 100,000 gallons per year, of liquid, semi-solid and solid domestic-wastewater-treatment-facility and/or package-treatment-plant sludge to three shallow surface disposal cells totaling 0.46 acres on a rotational basis.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

### IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions.

#### A. OPERATIONAL PLAN

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 2 and 4 NMAC.  [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated.  [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]



**Operating Conditions**

#	Terms and Conditions
3.	<p>The permittee shall maintain 24-inch berms around the facility to prevent surface water run-on and run-off. The berms shall be inspected on a regular basis, as well as after any major precipitation event, and repaired as necessary. In place of a berm across the facility entrance, the permittee shall maintain the shallow (minimum depth of six inches) stormwater diversion bar trenches parallel to each side of the facility entrance gate.</p> <p>[Subsection C of 20.6.2.3109 NMAC]</p>
4.	<p>The permittee shall maintain fences around the entire disposal facility to control access by the general public and animals. The fences surrounding the facility shall consist of a minimum of three-strand barbed wire fence and locking gates. Fences shall be maintained throughout the term of this Discharge Permit.</p> <p>[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]</p>
5.	<p>The permittee shall maintain the following signs at the following locations:</p> <ul style="list-style-type: none"> <li>• Signs posted at the facility entrance and every 500 feet along the facility boundary that state: "Notice: Waste Disposal Area - KEEP OUT" and "Aviso: Área de Disposición - NO ENTRAR".</li> <li>• A sign posted at the entrance gate with the name of the facility's contact person, office phone number of the contact person, emergency contact phone number for the facility, and physical location of facility including township, range, and section(s).</li> <li>• A sign posted at the entrance gate that states, "This facility is permitted by the New Mexico Environment Department. To contact the Department, dial 505-827-2900."</li> <li>• Signs on cells shall indicate in English and Spanish that the water is not potable.</li> <li>• A sign at the boundary of each cell to identify the cell number and the waste type authorized to be discharged in the cell.</li> </ul> <p>All signs shall be weatherproof and shall remain legible for the term of this Discharge Permit.</p> <p>[NMSA 1978, § 74-6-5.D, Subsections B and C of 20.6.2.3109 NMAC]</p>
6.	<p>The permittee shall maintain the surface disposal cells in such a manner as to avoid conditions that could affect the ability of septage and/or sludge to be evenly distributed across the surface of the disposal cells. Such conditions include or may be characterized by the following:</p> <ul style="list-style-type: none"> <li>• erosion damage;</li> <li>• animal burrows or other damage;</li> </ul>



#	Terms and Conditions
	<ul style="list-style-type: none"> <li>• the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within the disposal cell and/or surrounding berms;</li> <li>• the presence of large debris or large quantities of debris in the impoundment;</li> <li>• evidence of seepage; or</li> <li>• evidence of berm subsidence.</li> </ul> <p>Vegetation growing in or around the disposal cells shall be routinely controlled by mechanical removal in a manner that is protective of the disposal cell.</p> <p>The permittee shall visually inspect the disposal cells and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of a disposal cell or berm, or that may result in an unauthorized discharge, the permittee shall enact the contingency plan set forth in this Discharge Permit.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
7.	<p>Different waste types shall not be combined and shall be disposed of in separate cells that receive only a single designated waste type.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
8.	<p>The permittee shall inspect the facility weekly and collect any residual solid waste (trash) within the cells and elsewhere at the facility. The collected materials shall be disposed of in a manner consistent with all local, state and federal regulations.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
9.	<p>The permittee shall maintain splash pads for each cell to prevent erosion. Splash pads shall remain visible and undamaged.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>

***Domestic Septage***

#	Terms and Conditions
10.	<p>Domestic septage is defined as the residual wastes and water periodically pumped from a liquid waste treatment unit or from a holding tank for maintenance or disposal purposes.</p> <p>[74-6-2-N NMSA]</p>



#	Terms and Conditions
11.	Treatment and disposal of domestic septage sludge shall be in accordance with all local, state and federal requirements. Ponding of septage shall be minimized and the depth of liquid in any disposal cell shall not exceed 3 inches at any time.  [20.6.2.3109 NMAC]
12.	Each septage load being disposed of shall be mixed with lime and held at a pH of 12.0 for a minimum of 30 minutes. The amount of lime added and the final pH shall be included in the manifest summary submitted in the semi-annual monitoring reports.  [20.6.2.3109 NMAC]

***Domestic Wastewater Treatment Plant Sludge***

#	Terms and Conditions
13.	Domestic Wastewater Treatment Plant Sludge (sludge) is defined as the solid, semi-solid or liquid waste generated from a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant or air pollution control facility that is associated with the treatment of these wastes. "Sludge" does not mean treated effluent from a wastewater treatment plant.  [74-6-2-O NMSA]
14.	The permittee shall apply sludge to three unlined shallow surface disposal cells (Cells 3, 4, and 5) on a rotational basis. The sludge shall be evenly distributed throughout the individual cells in use. Ponding of liquid sludge shall be minimized and disposal of sludge shall be in accordance with all local, state and federal requirements.  [20.6.2.3109 NMAC]
15.	Each sludge load being disposed of shall be mixed with lime and held at a pH of 12.0 for 30 minutes. The amount of lime added and the final pH shall be included in the manifest summary submitted in the semi-annual monitoring reports.  [20.6.2.3109 NMAC]

**B. MONITORING AND REPORTING**

#	Terms and Conditions
16.	The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit.  [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]



#	Terms and Conditions
17.	<p>METHODOLOGY – Unless otherwise specified by this Discharge Permit, or approved in writing by NMED, the permittee shall use sampling and analytical techniques that conform with the references listed in Subsection B of 20.6.2.3107 NMAC.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
18.	<p>Semi-annual monitoring shall be performed during the following periods and reports submitted to NMED as follows:</p> <ul style="list-style-type: none"> <li>• January 1<sup>st</sup> through June 30<sup>th</sup> – <b>due by August 1<sup>st</sup>; and</b></li> <li>• July 1<sup>st</sup> through December 31<sup>st</sup> – <b>due by February 1<sup>st</sup>.</b></li> </ul> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
19.	<p>The permittee shall ensure there exists a manifest for each load of waste received. The manifest shall record the following information:</p> <ul style="list-style-type: none"> <li>• name of the hauling company;</li> <li>• date of receipt;</li> <li>• name and address of the waste origin;</li> <li>• type of waste or description of contamination;</li> <li>• volume of waste;</li> <li>• confirmation statement of inspection for acceptable waste type;</li> <li>• signature of person performing disposal action certifying the accuracy of the manifest; and</li> <li>• cell identification and location within the cell where the waste is discharged.</li> </ul> <p>Copies of each manifest created during the reporting period shall be submitted to NMED if requested. A summary of the manifests created during the reporting period shall be submitted in the semi-annual monitoring reports. The summaries shall include the date, customer, customer location, quantity disposed, cell disposed into, pounds of lime used and final pH.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
20.	<p>The permittee shall submit copies of documentation demonstrating compliance with the requirements set forth by 40 CFR Part 503. Documentation records shall be submitted to NMED in the next semi-annual monitoring report.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>



**Monitoring Actions with Implementation Deadlines**

#	Terms and Conditions
21.	<p>Within 180 days following the effective date of this Discharge Permit (<b>by DATE</b>), the permittee shall complete soil borehole sampling in Cells 6, 7, 10, 11, and 13. NMED shall be notified at least 30 days prior to the sampling event, and sampling shall be completed in the following manner:</p> <ul style="list-style-type: none"> <li>• One borehole per cell located in the center of each disposal cell</li> <li>• Samples taken from each borehole at 5ft depth intervals (5ft, 10ft, 15ft, etc.)</li> <li>• Samples shall be collected and maintained in sample coreboxes for NMED inspection</li> <li>• Conducted in such a way that detects groundwater if present</li> <li>• The depth of each borehole shall be to the first occurrence of a solid basalt layer</li> <li>• Laboratory analysis of each sample for the following physical properties           <ul style="list-style-type: none"> <li>○ Bulk density</li> <li>○ Particle size distribution</li> <li>○ Porosity</li> <li>○ Hydraulic conductivity</li> <li>○ Moisture content</li> </ul> </li> <li>• Laboratory analysis of each sample for the follow analytes           <ul style="list-style-type: none"> <li>○ TKN</li> <li>○ NO<sub>3</sub>-N</li> <li>○ NH<sub>3</sub>-N</li> <li>○ Cl</li> <li>○ TOC</li> </ul> </li> </ul> <p>All samples shall be collected and analyzed in accordance with EPA Soil Sampling Science and Ecosystem Support Division Operating Procedure, SESDPROC-300-R3 (enclosed) or ASTM methods D 420-93, D 1452-80, D 1586-84, D2488-93, D 4220-89, D 4700-91 and D 5434-93 .</p> <p>Each borehole shall be plugged and abandoned by emplacement of cement slurry from the bottom of the borehole to five feet below ground level. The final five feet of each borehole shall be filled with auger cuttings.</p> <p>90 days after completion of the sampling the permittee shall submit a completion report to NMED detailing the analysis and results for each cell.</p> <p>[Subsection C of 20.6.2.3106 NMAC, Subsection A of 20.6.2.3107 NMAC]</p>
22.	<p>If Total Nitrogen content is found to be elevated above the non-impacted levels identified by Table 11 (enclosed) in the 1999 study titled "Evaluation of the Migration of Nitrogen Compounds at the City of Santa Fe Sludge Disposal Site Near Santa Fe, New Mexico and at the S&amp;R Seotage Disposal Site Near Taos, NewMexico" in any of the samples collected</p>



#	Terms and Conditions
	<p>at a depth of 70 feet, the permittee shall submit a written monitoring well location proposal for review and approval by NMED within 60 days of the completion of the sampling required by Condition 21 of this Discharge Permit. The proposal shall designate the locations of the monitoring wells required to be installed by Condition 23 of this Discharge Permit. The proposal shall include, at a minimum, the following information.</p> <ul style="list-style-type: none"> <li>a) A map showing the proposed location of the monitoring wells.</li> <li>b) A written description of the specific location proposed for the monitoring wells including the distance (in feet) and direction of the monitoring wells from the edge of the source it is intended to monitor. Examples include: 35 feet north-northwest of the northern berm of the synthetically lined impoundment; 45 feet due south of the leachfield; 30 feet southeast of the re-use area 150 degrees from north.</li> <li>c) A statement describing the groundwater flow direction beneath the facility, and documentation and/or data supporting the determination.</li> </ul> <p>All monitoring well locations shall be approved by NMED prior to installation.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
23.	<p>Within 30 days of well location approval from NMED, the permittee shall install the following new monitoring wells.</p> <ul style="list-style-type: none"> <li>a) One monitoring well (MW-1) hydrologically upgradient of the facility.</li> <li>b) One monitoring well (MW-2) located 20 to 50 feet hydrologically downgradient of Cells 5, 6, 7, 8, 9, 10, 11 and 12.</li> <li>c) One monitoring well (MW-3) located 20 to 50 feet hydrologically downgradient of Cells 1, 2, 3, 4, 13, 14, 15 and 16.</li> </ul> <p>The well(s) shall be completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011</i>. (enclosed) Construction and lithologic logs shall be submitted to NMED within 30 days of well completion.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
24.	<p>Following the installation of the monitoring wells required by this Discharge Permit, the permittee shall sample groundwater in the wells and analyze the samples for TKN, NO<sub>3</sub>-N, TDS and Cl.</p> <p>Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure.</p> <ul style="list-style-type: none"> <li>a) Measure the depth-to-most-shallow groundwater from the top of the well casing to the nearest hundredth of a foot.</li> <li>b) Purge three well volumes of water from the well prior to sample collection.</li> <li>c) Obtain samples from the well for analysis.</li> </ul>



#	Terms and Conditions
	<p>d) Properly prepare, preserve and transport samples.            e) Analyze samples in accordance with the methods authorized in this Discharge Permit.</p> <p>Well completion report (including the Office of the State Engineer permit), depth-to-most-shallow groundwater measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED within 45 days of the installation of the monitoring wells.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
25.	<p>If monitoring wells are required to be installed, within 150 days following the installation of the monitoring wells, the permittee shall survey all wells approved by NMED for Discharge Permit monitoring purposes to a U.S. Geological Survey (USGS) or other permanent benchmark. Survey data shall include northing, easting and elevation to the nearest hundredth of a foot or shall be in accordance with the "Minimum Standards for Surveying in New Mexico" (12.8.2 NMAC). A survey elevation shall be established at the top-of-casing, with a permanent marking indicating the point of survey. The survey shall bear the seal and signature of a licensed New Mexico professional surveyor (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority).</p> <p>Depth-to-most-shallow groundwater shall be measured to the nearest hundredth of a foot in all surveyed wells [and referenced to mean sea level], and the data shall be used to develop a groundwater elevation contour map showing the location of all monitoring wells and the direction and gradient of groundwater flow at the facility. The data and groundwater elevation contour map shall be submitted to NMED within 30 days of survey completion.</p> <p>[Subsection A of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>

***Ground Water Monitoring Conditions***

#	Terms and Conditions
26.	<p>If monitoring wells are required to be installed, the permittee shall perform semi-annual groundwater sampling in the following monitoring wells and analyze the samples and detected constituents for TKN, NO<sub>3</sub>-N, TDS and Cl.</p> <p>a) MW-1, intended to be located hydrologically upgradient of the facility.            b) MW-2, intended to be located hydrologically downgradient of Cells 5, 6, 7, 8, 9, 10, 11 and 12.            c) MW-3, intended to be located hydrologically downgradient of Cells 1, 2, 3, 4, 13, 14, 15 and 16.</p>



#	Terms and Conditions
	<p>Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure.</p> <ol style="list-style-type: none"> <li>a) Measure the depth-to-most-shallow groundwater from the top of the well casing to the nearest hundredth of a foot.</li> <li>b) Purge three well volumes of water from the well prior to sample collection.</li> <li>c) Obtain samples from the well for analysis.</li> <li>d) Properly prepare, preserve and transport samples.</li> <li>e) Analyze samples in accordance with the methods authorized in this Discharge Permit.</li> </ol> <p>Depth-to-most-shallow groundwater measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
27.	<p>If monitoring wells are required to be installed, the permittee shall develop a groundwater elevation contour map on a semi-annual basis using the top of casing elevation data from the monitoring well survey and semi-annual depth-to-most-shallow groundwater measurements, referenced to mean sea level, obtained from the groundwater monitoring wells required by this Discharge Permit.</p> <p>The groundwater elevation contour map shall depict the groundwater flow direction based on the groundwater elevation contours. Groundwater elevations between monitoring well locations shall be estimated using common interpolation methods. A contour interval appropriate to the data shall be used, but the interval shall, in no case, be greater than two feet. Groundwater elevation contour maps shall depict the groundwater flow direction, using arrows, based on the orientation of the groundwater elevation contours, and the location and identification of each monitoring well and contaminant source. The groundwater elevation contour map shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
28.	<p>NMED shall have the option to perform downhole inspections of all monitoring wells identified in this Discharge Permit. NMED shall establish the inspection date and provide at least a 60-day notice to the permittee by certified mail. The permittee shall have any existing dedicated pumps removed at least 48 hours prior to NMED inspection to allow adequate settling time of sediment agitated from pump removal.</p> <p>Should a facility not have existing dedicated pumps, but decide to install pumps in any of the monitoring wells, NMED shall be notified at least 90 days prior to pump installation so that a downhole well inspection(s) can be scheduled prior to pump placement.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>



**Domestic Septage**

#	Terms and Conditions
29.	<p>The permittee shall complete a Surface Disposal Data Sheet (SDDS) to document the amount of nitrogen applied to each surface disposal cell each month. A SDDS shall be completed for each cell, and shall reflect the volume and total nitrogen concentration of waste discharged to the land disposal cells for each month. The total nitrogen concentration shall be determined from either of the following methods:</p> <ol style="list-style-type: none"> <li>1) Assuming total nitrogen concentration of 600 mg/L based on average characteristics of septage (Guide to Septage Treatment and Disposal, EPA/625/R-94-002); or</li> <li>2) Assuming a total nitrogen value derived from the laboratory analysis of a composite sample from a minimum of six waste loads using a sampling protocol approved by NMED prior to sample collection.</li> </ol> <p>Nitrogen content shall not be adjusted to account for volatilization or mineralization processes. The SDDS, or a statement that no surface disposal occurred within the specific cell, shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>

**Domestic Wastewater Treatment Plant Sludge**

#	Terms and Conditions
30.	<p>The permittee shall measure and record the volume and dry weight of sludge discharged to the surface disposal cells each month by tracking the volume of the loads received and the percent total solids as determined by sampling each type of sludge (i.e., solid, semi-solid, liquid). Records of the volume and dry weight of the sludge discharged shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
31.	<p>The permittee shall sample each sludge type (solid, semi-solid and liquid) transported to the surface disposal facility on a quarterly basis and analyze the samples for TKN and NO<sub>3</sub>-N. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, reported as mg/kg for TKN and NO<sub>3</sub>-N (dry weight basis), shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
32.	<p>The permittee shall on a monthly basis complete a SDDS to document the amount of nitrogen applied to each surface disposal cell. A SDDS shall be completed for each sludge type (solid, semi-solid and liquid) associated with each disposal cell, and shall reflect the nitrogen concentration from the quarterly sludge analysis and the total number of dry tons discharged each month. Nitrogen content shall not be adjusted to account for volatilization</p>



#	Terms and Conditions
	<p>or mineralization processes. The SDDS, or a statement that no surface disposal occurred within the specific cells, shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>

**Disposal Cell Monitoring**

#	Terms and Conditions
33.	<p>Composite samples shall be collected semi-annually from five locations within each of the shallow disposal cells. Using a hand auger or shovel, the permittee shall collect soil samples from five locations in each cell, from the surface to a depth of eight inches. The soil samples from the five locations shall be mixed together, and the composite sample shall be analyzed for TKN, NO3-N and Fats Oils and Grease(FOG)/Total Petroleum Hydrocarbons (TPH). Samples shall be collected and analyzed, and the analytical results shall be submitted to NMED in the semi-annual monitoring reports.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>

**C. CONTINGENCY PLAN**

#	Terms and Conditions
34.	<p>If monitoring wells are required to be installed at the facility and in the event that groundwater monitoring indicates that a groundwater quality standard identified in Section 20.6.2.3103 NMAC is exceeded or a toxic pollutant as defined in Section 20.6.2.7 NMAC is present, the permittee shall collect a confirmatory sample from the monitoring well within 15 days of receipt of the initial sampling results to confirm the initial sampling results.</p> <p>Within 60 days of confirmation of groundwater contamination, the permittee shall submit to NMED a Corrective Action Plan that proposes, at a minimum, source control measures and an implementation schedule. The Plan shall be enacted as approved by NMED.</p> <p>Once invoked (whether during the term of this Discharge Permit, or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and groundwater monitoring confirms for a minimum of eight (8) consecutive quarterly samples that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in groundwater.</p>



#	Terms and Conditions
	<p>If the groundwater standard continues to be violated or the toxic pollutant continues to be present 180 days after the confirmation of groundwater contamination, the permittee may be required to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>
35.	<p>In the event that monitoring wells are required to be installed at the facility and information available to NMED indicates that a well is not constructed in a manner consistent with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011; contains insufficient water to effectively monitor groundwater quality; or is not completed in a manner that is protective of groundwater quality, the permittee shall install a replacement well(s) within 120 days following notification from NMED.</p> <p>The permittee shall survey the replacement monitoring well(s) within 150 days following notification from NMED.</p> <p>Replacement well locations shall be approved by NMED prior to installation and completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map to NMED within 60 days following well completion.</p> <p>Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, abandonment and documentation of the abandonment procedures shall be completed in accordance with the attachment titled <i>Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions</i>, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.</p> <p>[Subsection A of 20.6.2.3107 NMAC]</p>
36.	<p>In the event that the soil sampling show that the amount of FOG/TPH is elevated above 3,000 mg/kg, the permittee shall excavate and dispose of the contaminated soil. The permittee shall propose completion of removal by submitting a Corrective Action Plan to NMED for approval. The Plan shall include a schedule for completion of corrective actions and shall be submitted within 90 days following the end of the monitoring period in which the exceedance occurred. The permittee shall initiate implementation of the Plan following approval by NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>



#	Terms and Conditions
37.	<p>In the event that inspection findings reveal significant damage likely to affect the structural integrity of disposal cell or its ability to contain contaminants, the permittee shall propose the repair of the cell by submitting a Corrective Action Plan to NMED for approval. The Plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant damage is evident. The Corrective Action Plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the Plan following approval by NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]</p>
38.	<p>In the event that a release (commonly known as a “spill”) occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below.</p> <p>Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information.</p> <ol style="list-style-type: none"><li>a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility.</li><li>b) The name and address of the facility.</li><li>c) The date, time, location, and duration of the unauthorized discharge.</li><li>d) The source and cause of unauthorized discharge.</li><li>e) A description of the unauthorized discharge, including its estimated chemical composition.</li><li>f) The estimated volume of the unauthorized discharge.</li><li>g) Any actions taken to mitigate immediate damage from the unauthorized discharge.</li></ol> <p>Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates.</p> <p>Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following information.</p> <ol style="list-style-type: none"><li>a) A description of proposed actions to mitigate damage from the unauthorized discharge.</li><li>b) A description of proposed actions to prevent future unauthorized discharges of this nature.</li><li>c) A schedule for completion of proposed actions.</li></ol> <p>In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103</p>



#	Terms and Conditions
	<p>NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC.</p> <p>Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC.</p> <p>[20.6.2.1203 NMAC]</p>
39.	<p>In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a Corrective Action Plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]</p>

**D. CLOSURE PLAN**

***Permanent Facility Closure – All Disposal Cell Types***

#	Terms and Conditions
40.	<p>Upon closure of the facility, the permittee shall perform the following closure measures:</p> <ul style="list-style-type: none"> <li>a) Backfill the cells with clean fill (as necessary) and contour to provide for positive stormwater drainage.</li> <li>b) Re-vegetate the cells and disturbed areas at the facility by establishing a vegetative cover equal to 70% of the native perennial vegetative cover consisting of at least three native plant species including at least one grass, but not including noxious weeds. The permittee shall maintain the vegetative cover through two consecutive growing seasons.</li> <li>c) Submit proof to NMED that all closure activities set forth for the facility under 40 CFR 503 have been completed.</li> </ul> <p>When all closure and post-closure requirements have been met, the permittee may submit a written request for termination of the Discharge Permit to NMED.</p> <p>[Subsection A of 20.6.2.3107 NMAC, Subsection D of 20.6.2.4103 NMAC, 40 CFR Part 503]</p>



**E. GENERAL TERMS AND CONDITIONS**

#	Terms and Conditions
41.	<p>RECORD KEEPING - The permittee shall maintain a written record of:</p> <ul style="list-style-type: none"> <li>• information and data used to complete the application for this Discharge Permit;</li> <li>• any releases (commonly known as “spills”) not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC;</li> <li>• the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater;</li> <li>• all manifest of waste shipments recieved</li> <li>• facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer;</li> <li>• copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit;</li> <li>• the volume of wastewater or other wastes discharged pursuant to this Discharge Permit;</li> <li>• groundwater quality and wastewater quality data collected pursuant to this Discharge Permit;</li> <li>• copies of construction records (well log) for all groundwater monitoring wells required to be sampled pursuant to this Discharge Permit;</li> <li>• the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit; and</li> <li>• data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit, including:             <ul style="list-style-type: none"> <li>○ the dates, location and times of sampling or field measurements;</li> <li>○ the name and job title of the individuals who performed each sample collection or field measurement;</li> <li>○ the sample analysis date of each sample</li> <li>○ the name and address of the laboratory, and the name of the signatory authority for the laboratory analysis;</li> <li>○ the analytical technique or method used to analyze each sample or collect each field measurement;</li> <li>○ the results of each analysis or field measurement, including raw data;</li> <li>○ the results of any split, spiked, duplicate or repeat sample; and</li> <li>○ a copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used.</li> </ul> </li> </ul> <p>The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request.</p> <p>[Subsections A and D of 20.6.2.3107 NMAC]</p>



#	Terms and Conditions
42.	<p>INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations that are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.</p> <p>The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.</p> <p>Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations.</p> <p>[Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]</p>
43.	<p>DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED’s request, allow for NMED’s inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records.</p> <p>[Subsection D of 20.6.2.3107 NMAC]</p>
44.	<p>MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility’s discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes.</p> <p>[Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]</p>
45.	<p>PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction.</p> <p>In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit that result in only a minor effect on the character of the discharge, the</p>



#	Terms and Conditions
	<p>permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED.</p> <p>[Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]</p>
46.	<p>CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to \$15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to \$10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]</p>
47.	<p>CRIMINAL PENALTIES – No person shall:</p> <ul style="list-style-type: none"> <li>• make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA;</li> <li>• falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or</li> <li>• fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.</li> </ul> <p>Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily</p>



#	Terms and Conditions
	<p>injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.</p> <p>[20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]</p>
48.	<p>COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with any other applicable federal, state, and/or local laws, regulations, zoning requirements, nuisance ordinances, permits or orders.</p> <p>[NMSA 1978, § 74-6-5.L]</p>
49.	<p>RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.</p> <p>[20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]</p>
50.	<p>TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall:</p> <ul style="list-style-type: none"> <li>• notify the proposed transferee in writing of the existence of this Discharge Permit;</li> <li>• include a copy of this Discharge Permit with the notice; and</li> <li>• deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee.</li> </ul> <p>Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility.</p> <p>[20.6.2.3111 NMAC]</p>
51.	<p>PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date.</p> <p>Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay</p>



#	Terms and Conditions
	<p>all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date.</p> <p>[Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]</p>

draft









**New Mexico Environment Department Ground Water Quality Bureau  
Discharge Permit Summary**

**Facility Information**

<b>Facility Name</b>	S&R Septic
<b>Discharge Permit Number</b>	DP-465
<b>Legally Responsible Party</b>	Steve and Loretta Rael, Owners PO Box 3155 Rancho de Taos, NM 87557 (575) 758-3515

**Treatment, Disposal and Site Information**

<b>Primary Waste Type</b>	Domestic
<b>Facility Type</b>	Septage/Sludge Surface Disposal

**Discharge Locations**

Type	Designation	Description & Comments
Land Disposal	Cell 1	0.21-acre shallow septage disposal cell
Land Disposal	Cell 2	0.15-acre shallow septage disposal cell
Land Disposal	Cell 3	0.14-acre shallow septage disposal cell
Land Disposal	Cell 4	0.18-acre shallow septage disposal cell
Land Disposal	Cell 5	0.13-acre shallow septage disposal cell
Land Disposal	Cell 6	0.06-acre shallow septage disposal cell
Land Disposal	Cell 7	0.13-acre shallow septage disposal cell
Land Disposal	Cell 8	0.17-acre shallow septage disposal cell
Land Disposal	Cell 9	0.28-acre shallow septage disposal cell
Land Disposal	Cell 10	0.17-acre shallow septage disposal cell
Land Disposal	Cell 11	0.13-acre shallow septage disposal cell
Land Disposal	Cell 12	0.18-acre shallow septage disposal cell
Land Disposal	Cell 13	0.11-acre shallow septage disposal cell
Land Disposal	Cell 14	0.14-acre shallow wastewater treatment plant sludge disposal cell
Land Disposal	Cell 15	0.10-acre shallow wastewater treatment plant sludge disposal cell
Land Disposal	Cell 16	0.15-acre shallow wastewater treatment plant sludge disposal cell





**New Mexico Environment Department Ground Water Quality Bureau  
Discharge Permit Summary**

**Monitoring Locations**

Type	Designation	Description & Comments
Composite Soil Sample	Cell 1	0.21-acre shallow septage disposal cell
Composite Soil Sample	Cell 2	0.15-acre shallow septage disposal cell
Composite Soil Sample	Cell 3	0.14-acre shallow septage disposal cell
Composite Soil Sample	Cell 4	0.18-acre shallow septage disposal cell
Composite Soil Sample	Cell 5	0.13-acre shallow septage disposal cell
Composite Soil Sample	Cell 6	0.06-acre shallow septage disposal cell
Composite Soil Sample	Cell 7	0.13-acre shallow septage disposal cell
Composite Soil Sample	Cell 8	0.17-acre shallow septage disposal cell
Composite Soil Sample	Cell 9	0.28-acre shallow septage disposal cell
Composite Soil Sample	Cell 10	0.17-acre shallow septage disposal cell
Composite Soil Sample	Cell 11	0.13-acre shallow septage disposal cell
Composite Soil Sample	Cell 12	0.18-acre shallow septage disposal cell
Composite Soil Sample	Cell 13	0.11-acre shallow septage disposal cell
Composite Soil Sample	Cell 14	0.14-acre shallow wastewater treatment plant sludge disposal cell
Composite Soil Sample	Cell 15	0.10-acre shallow wastewater treatment plant sludge disposal cell
Composite Soil Sample	Cell 16	0.15-acre shallow wastewater treatment plant sludge disposal cell
Monitoring Well	MW-1	Hydrologically upgradient of the facility
Monitoring Well	MW-2	20 to 50 feet hydrologically downgradient of Cells 5, 6, 7, 8, 9, 10, 11 and 12
Monitoring Well	MW-3	20 to 50 feet hydrologically downgradient of Cells 1, 2, 3, 4, 13, 14, 15 and 16

**Depth-to-Ground Water** >500 feet  
**Total Dissolved Solids (TDS)** 300-400 mg/L

**Permit Information**

**Application Received** February 22, 2018  
**Public Notice Published** [not yet published]  
**Discharge Permit Issued** [effective date]  
**Discharge Permit Term Ends** [term end date]





## New Mexico Environment Department Ground Water Quality Bureau Discharge Permit Summary

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**Permitted Discharge Volume**

9,857 gallons per day of domestic septage and 8,333 gallons per month of domestic wastewater treatment plant sludge.

---

### NMED Contact Information

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draft









**New Mexico Environment Department  
Ground Water Quality Bureau  
20.6.2.3103 STANDARDS FOR GROUND WATER**

This table lists the numeric ground water standards in 20.6.2.3103 NMAC, effective as of December 21, 2018. It does not list the “toxic pollutants” for which Subsection A of 20.6.2.3103 NMAC establishes a narrative standard. The list of “toxic pollutants” can be found in Subsection T of 20.6.2.7 NMAC. The standards with an asterisk (\*) take effect on July 1, 2020 for past and current water discharges occurring as of July 1, 2017. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

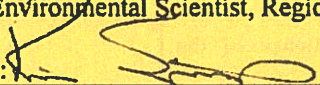
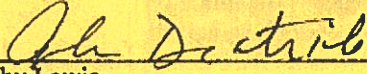
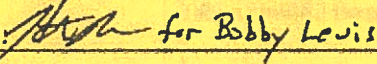
<b>Contaminant (Abbreviation) (CAS Number)</b>	<b>Standard</b>
<b>Numerical Standards (mg/l unless otherwise noted)</b>	
Antimony (Sb) (CAS 7440-36-0)	0.006
Arsenic (As) (CAS 7440-38-2)	0.01*
Barium (Ba) (CAS 7440-39-3)	2.0
Beryllium (Be) (CAS 7440-41-7)	0.004
Cadmium (Cd) (CAS 7440-43-9)	0.005*
Chromium (Cr) (CAS 7440-47-3)	0.05
Cyanide (CN) (CAS 57-12-5)	0.2
Fluoride (F) (CAS 16984-48-8)	1.6
Lead (Pb) (CAS 7439-92-1)	0.015*
Total Mercury (Hg) (CAS 7439-97-6)	0.002
Nitrate (NO <sub>3</sub> as N) (CAS 14797-55-8)	10.0
Nitrite (NO <sub>2</sub> as N) (CAS 10102-44-0)	1.0
Selenium (Se) (CAS 7782-49-2)	0.05
Silver (Ag) (CAS 7440-224)	0.05
Thallium (Tl) (CAS 7440-28-0)	0.002
Uranium (U) (CAS 7440-61-1)	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)	5 pCi/l*
Benzene (CAS 71-43-2)	0.005*
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	0.0005*
Toluene (CAS 108-88-3)	1.0
Carbon Tetrachloride (CAS 56-23-5)	0.005*
1,2-dichloroethane (EDC) (CAS 107-06-2)	0.005*
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.007
tetrachloroethylene (PCE) (CAS 127-18-4)	0.005*
trichloroethylene (TCE) (CAS 79-01-6)	0.005*
ethylbenzene (CAS 100-41-4)	0.7*
total xylenes (CAS 1330-20-7)	0.62
methylene chloride (CAS 75-09-2)	0.005*
chloroform (CAS 67-66-3)	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	0.00005*
1,1,1-trichloroethane (CAS 71-55-6)	0.2
1,1,2-trichloroethane (CAS 79-00-5)	0.005*
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01
vinyl chloride (CAS 75-01-4)	0.002
PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	0.005



styrene (CAS 100-42-5)	0.1
1,2-dichlorobenzene (CAS 95-50-1)	0.6
1,4-dichlorobenzene (CAS 106-46-7)	0.075
1,2,4-trichlorobenzene (CAS 120-82-1)	0.07
pentachlorophenol (CAS 87-86-5)	0.001
atrazine (CAS 1912-24-9)	0.003
<b>Other Standards for Domestic Water Supply</b>	
Chloride (Cl) (CAS 16887-00-6)	250
Copper (Cu) (CAS 7440-50-80)	1.0
Iron (Fe) (CAS 7439-89-6)	1.0
Manganese (Mn) (CAS 7439-96-5)	0.2
Phenols	0.005
Sulfate (SO <sub>4</sub> ) (CAS 14808-79-8)	600
Total Dissolved Solids (TDS)	1000
Zinc (Zn) (CAS 7440-66-6)	10
pH	6-9
Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)	0.1
<b>Standards for Irrigation Use</b>	
Aluminum (Al) (CAS 7429-90-5)	5.0
Boron (B) (CAS 7440-42-8)	0.75
Cobalt (Co) (CAS 7440-48-4)	0.05
Molybdenum (Mo) (CAS 7439-98-7)	1.0
Nickel (Ni) (CAS 7440-02-0)	0.2



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<b>Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Athens, Georgia</b>	
<b>OPERATING PROCEDURE</b>	
<b>Title: Soil Sampling</b>	
<b>Effective Date:</b> August 21, 2014	<b>Number:</b> SESDPROC-300-R3
<b>Authors</b>	
<b>Name:</b> Kevin Simmons <b>Title:</b> Environmental Scientist, Regional Expert	
<b>Signature:</b> 	<b>Date:</b> 8/18/2014
<b>Approvals</b>	
<b>Name:</b> John Deatruck <b>Title:</b> Acting Chief, Enforcement and Investigations Branch	
<b>Signature:</b> 	<b>Date:</b> 8/18/14
<b>Name:</b> Bobby Lewis <b>Title:</b> Field Quality Manager, Science and Ecosystem Support Division	
<b>Signature:</b>  for Bobby Lewis	<b>Date:</b> 8/20/14



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## Revision History

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The top row of this table shows the most recent changes to this controlled document. For previous revision history information, archived versions of this document are maintained by the SESD Document Control Coordinator on the SESD local area network (LAN).

History	Effective Date
<p>SESDPROC-300-R3, <i>Soil Sampling</i>, replaces SESDPROC-300-R2.</p> <p><b>General:</b> Corrected any typographical, grammatical and/or editorial errors.</p> <p><b>Title Page:</b> Updated the author from Fred Sloan to Kevin Simmons. Updated the Enforcement and Investigations Branch Chief from Archie Lee to Acting Chief, John Deatrick.</p> <p>Section 1.5.1: Added "The reader should" to last sentence of the paragraph.</p> <p>Section 1.5.2: Omitted "When sampling in landscaped areas," from first sentence of eighth bullet.</p> <p>Section 3.2.4: In the first paragraph, first sentence, added "(rapidly form bubbles)." Omitted "(rapidly form bubbles)" from second paragraph, second sentence.</p> <p>Any reference to "Percent Moisture and Preservation Compatibility (MOICA)" or "Percent Moisture" was changed to "Percent Solids", both in the text and in Table 1.</p>	August 21, 2014
SESDPROC-300-R2, <i>Soil Sampling</i> , replaces SESDPROC-300-R1.	December 20, 2011
SESDPROC-300-R1, <i>Soil Sampling</i> , replaces SESDPROC-300-R0.	November 1, 2007
SESDPROC-300-R0, <i>Soil Sampling</i> , Original Issue	February 05, 2007



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## 1 General Information

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### 1.1 Purpose

This document describes general and specific procedures, methods and considerations to be used and observed when collecting soil samples for field screening or laboratory analysis.

### 1.2 Scope/Application

The procedures contained in this document are to be used by field personnel when collecting and handling soil samples in the field. On the occasion that SESD field personnel determine that any of the procedures described in this section are inappropriate, inadequate or impractical and that another procedure must be used to obtain a soil sample, the variant procedure will be documented in the field logbook and subsequent investigation report, along with a description of the circumstances requiring its use. Mention of trade names or commercial products in this operating procedure does not constitute endorsement or recommendation for use.

### 1.3 Documentation/Verification

This procedure was prepared by persons deemed technically competent by SESD management, based on their knowledge, skills and abilities and have been tested in practice and reviewed in print by a subject matter expert. The official copy of this procedure resides on the SESD local area network (LAN). The Document Control Coordinator (DCC) is responsible for ensuring the most recent version of the procedure is placed on the LAN, and for maintaining records of review conducted prior to its issuance.

### 1.4 References

International Air Transport Authority (IATA). Dangerous Goods Regulations, Most Recent Version

SESD Operating Procedure for Field Equipment Cleaning and Decontamination, SESDPROC-205, Most Recent Version

SESD Operating Procedure for Field Equipment Cleaning and Decontamination at the FEC, SESDPROC-206, Most Recent Version

SESD Operating Procedure for Field Sampling Quality Control, SESDPROC-011, Most Recent Version



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SESD Operating Procedure for Field X-Ray Fluorescence (XRF) Measurement, SESDPROC-107, Most Recent Version

SESD Operating Procedure for Logbooks, SESDPROC-010, Most Recent Version

SESD Operating Procedure for Sample and Evidence Management, SESDPROC-005, Most Recent Version

Title 49 Code of Federal Regulations, Pts. 171 to 179, Most Recent Version

US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, Most Recent Version (Method 5035)

US EPA. Safety, Health and Environmental Management Program (SHEMP) Procedures and Policy Manual. Region 4 SESD, Athens, GA, Most Recent Version

## 1.5 General Precautions

### 1.5.1 Safety

Proper safety precautions must be observed when collecting soil samples. Refer to the SESD Safety, Health and Environmental Management Program (SHEMP) Procedures and Policy Manual and any pertinent site-specific Health and Safety Plans (HASP) for guidelines on safety precautions. These guidelines, however, should only be used to complement the judgment of an experienced professional. The reader should address chemicals that pose specific toxicity or safety concerns and follow any other relevant requirements, as appropriate.

### 1.5.2 Procedural Precautions

The following precautions should be considered when collecting soil samples:

- Special care must be taken not to contaminate samples. This includes storing samples in a secure location to preclude conditions which could alter the properties of the sample. Samples shall be custody sealed during long-term storage or shipment.
- Collected samples are in the custody of the sampler or sample custodian until the samples are relinquished to another party.
- If samples are transported by the sampler, they will remain under his/her custody or be secured until they are relinquished.
- Shipped samples shall conform to all U.S. Department of Transportation (DOT) rules of shipment found in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179), and/or International Air Transportation Association



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(IATA) hazardous materials shipping requirements found in the current edition of IATA's Dangerous Goods Regulations.

- Documentation of field sampling is done in a bound logbook.
- Chain-of-custody documents shall be filled out and remain with the samples until custody is relinquished.
- All shipping documents, such as air bills, bills of lading, etc., shall be retained by the project leader in the project files.
- Sampling in landscaped areas: Cuttings should be placed on plastic sheeting and returned to the borehole upon completion of the sample collection. Any 'turf plug' generated during the sampling process should be returned to the borehole.
- Sampling in non-landscaped areas: Return any unused sample material back to the auger, drill or push hole from which the sample was collected.



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## 2 Special Sampling Considerations

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### 2.1 Special Precautions for Trace Contaminant Soil Sampling

- A clean pair of new, non-powdered, disposable gloves will be worn each time a different sample is collected and the gloves should be donned immediately prior to sampling. The gloves should not come in contact with the media being sampled and should be changed any time during sample collection when their cleanliness is compromised.
- Sample containers with samples suspected of containing high concentrations of contaminants shall be handled and stored separately.
- All background samples shall be segregated from obvious high-concentration or waste samples. Sample collection activities shall proceed progressively from the least suspected contaminated area to the most suspected contaminated area. Samples of waste or highly-contaminated media must not be placed in the same ice chest as environmental (i.e., containing low contaminant levels) or background samples.
- If possible, one member of the field sampling team should take all the notes and photographs, fill out tags, etc., while the other member(s) collect the samples.
- Samplers must use new, verified/certified-clean disposable or non-disposable equipment cleaned according to procedures contained in the SESD Operating Procedure for Field Equipment Cleaning and Decontamination (SESDPROC-205), for collection of samples for trace metals or organic compound analyses.

### 2.2 Sample Homogenization

1. If sub-sampling of the primary sample is to be performed in the laboratory, transfer the entire primary sample directly into an appropriate, labeled sample container(s). Proceed to step 4.
2. If sub-sampling the primary sample in the field or compositing multiple primary samples in the field, place the sample into a glass or stainless steel homogenization container and mix thoroughly. Each aliquot of a composite sample should be of the same approximate volume.
3. All soil samples must be thoroughly mixed to ensure that the sample is as representative as possible of the sample media. ***Samples for VOC analysis are not homogenized.*** The most common method of mixing is referred to as quartering. The quartering procedure should be performed as follows:



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- The material in the sample pan should be divided into quarters and each quarter should be mixed individually.
- Two quarters should then be mixed to form halves.
- The two halves should be mixed to form a homogenous matrix.

This procedure should be repeated several times until the sample is adequately mixed. If round bowls are used for sample mixing, adequate mixing is achieved by stirring the material in a circular fashion, reversing direction, and occasionally turning the material over.

4. Place the sample into an appropriate, labeled container(s) by using the alternate shoveling method and secure the cap(s) tightly. The alternate shoveling method involves placing a spoonful of soil in each container in sequence and repeating until the containers are full or the sample volume has been exhausted. Threads on the container and lid should be cleaned to ensure a tight seal when closed.

## 2.3 Dressing Soil Surfaces

Any time a vertical or near vertical surface is sampled, such as achieved when shovels or similar devices are used for subsurface sampling, the surface should be dressed (scraped) to remove smeared soil. This is necessary to minimize the effects of contaminant migration interferences due to smearing of material from other levels.

## 2.4 Quality Control

If possible, a control sample should be collected from an area not affected by the possible contaminants of concern and submitted with the other samples. This control sample should be collected as close to the sampled area as possible and from the same soil type. Equipment blanks should be collected if equipment is field cleaned and re-used on-site or if necessary to document that low-level contaminants were not introduced by sampling tools. SESD Operating Procedure for Field Sampling Quality Control (SESDPROC-011) contains other procedures that may be applicable to soil sampling investigations.

## 2.5 Records

Field notes, recorded in a bound field logbook, as well as chain-of-custody documentation will be generated as described in the SESD Operating Procedure for Logbooks (SESDPROC-010) and the SESD Operating Procedure for Sample and Evidence Management (SESDPROC-005).



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## 3 Method 5035

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The procedures outlined here are summarized from *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, Method 5035*.

### 3.1 Soil Samples for Volatile Organic Compounds (VOC) Analysis

If samples are to be analyzed for VOCs, they should be collected in a manner that minimizes disturbance of the sample. For example, when sampling with an auger bucket, the sample for VOC analysis should be collected directly from the auger bucket (preferred) or from minimally disturbed material immediately after an auger bucket is emptied into the pan. The sample shall be containerized by filling an En Core® Sampler or other Method 5035 compatible container. ***Samples for VOC analysis are not homogenized.*** Preservatives may be required for some samples with certain variations of Method 5035. Consult the method or the principal analytical chemist to determine if preservatives are necessary.

### 3.2 Soil Sampling (Method 5035)

The following sampling protocol is recommended for site investigators assessing the extent of VOCs in soils at a project site. Because of the large number of options available, careful coordination between field and laboratory personnel is needed. The specific sampling containers and sampling tools required will depend upon the detection levels and intended data use. Once this information has been established, selection of the appropriate sampling procedure and preservation method best applicable to the investigation can be made.

#### 3.2.1 Equipment

Soil for VOC analyses may be retrieved using any of the SESD soil sampling methods described in Sections 4 through 8 of this procedure. Once the soil has been obtained, the En Core® Sampler, syringes, stainless steel spatula, standard 2-oz. soil VOC container, or pre-prepared 40 mL vials may be used/required for sub-sampling. The specific sample containers and the sampling tools required will depend upon the data quality objectives established for the site or sampling investigation. The various sub-sampling methods are described below.

#### 3.2.2 Sampling Methodology - Low Concentrations (<200 µg/kg)

When the total VOC concentration in the soil is expected to be less than 200 µg/kg, the samples may be collected directly with the En Core® Sampler or syringe. If using the syringes, the sample must be placed in the sample container (40 mL pre-prepared vial) immediately to reduce volatilization losses. The 40 mL vials should contain 10 mL of organic-free water for an un-preserved sample or approximately



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10 mL of organic-free water and a preservative. It is recommended that the 40 mL vials be prepared and weighed by the laboratory (commercial sources are available which supply preserved and tared vials). When sampling directly with the En Core® Sampler, the vial must be immediately capped and locked.

A soil sample for VOC analysis may also be collected with conventional sampling equipment. A sample collected in this fashion must either be placed in the final sample container (En Core® Sampler or 40 mL pre-prepared vial) immediately or the sample may be immediately placed into an intermediate sample container with no head space. If an intermediate container (usually 2-oz. soil jar) is used, the sample must be transferred to the final sample container (En Core® Sampler or 40 mL pre-prepared vial) as soon as possible, not to exceed 30 minutes.

NOTE: After collection of the sample into either the En Core® Sampler or other container, the sample must immediately be stored in an ice chest and cooled.

Soil samples may be prepared for shipping and analysis as follows:

*En Core® Sampler* - the sample shall be capped, locked, and secured in the original foil bag. All foil bags containing En Core® samplers are then placed in a plastic bag and sealed with custody tape, if required.

*Syringe* - Add about 3.7 cc (approximately 5 grams) of sample material to 40-mL pre-prepared containers. Secure the containers in a plastic bag. Do not use a custody seal on the container; place the custody seal on the plastic bag. Note: When using the syringes, it is important that no air is allowed to become trapped behind the sample prior to extrusion, as this will adversely affect the sample.

*Stainless Steel Laboratory Spatulas* - Add between 4.5 and 5.5 grams (approximate) of sample material to 40 mL containers. Secure the containers in a plastic bag. Do not use a custody seal on the container; place the custody seal on the plastic bag.

### **3.2.3 Sampling Methodology - High Concentrations (>200 µg/kg)**

Based upon the data quality objectives and the detection level requirements, this high level method may also be used. Specifically, the sample may be packed into a single 2-oz. glass container with a screw cap and septum seal. The sample container must be filled quickly and completely to eliminate head space. Soils/sediments containing high total VOC concentrations may also be collected as described in Section 3.2.2, Sampling Methodology - Low Concentrations, and preserved using 10 mL methanol.



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## 3.2.4 *Special Techniques and Considerations for Method 5035*

### Effervescence

If low concentration samples effervesce (rapidly form bubbles) from contact with the acid preservative, then either a test for effervescence must be performed prior to sampling, or the investigators must be prepared to collect each sample both preserved or un-preserved, as needed, or all samples must be collected unpreserved.

To check for effervescence, collect a test sample and add to a pre-preserved vial. If preservation (acidification) of the sample results in effervescence then preservation by acidification is not acceptable, and the sample must be collected un-preserved.

If effervescence occurs and only pre-preserved sample vials are available, the preservative solution may be placed into an appropriate hazardous waste container and the vials triple rinsed with organic free water. An appropriate amount of organic free water, equal to the amount of preservative solution, should be placed into the vial. The sample may then be collected as an un-preserved sample. Note: the amount of organic free water placed into the vials will have to be accurately measured.

### Sample Size

While this method is an improvement over earlier ones, field investigators must be aware of an inherent limitation. Because of the extremely small sample size and the lack of sample mixing, sample representativeness for VOCs may be reduced compared to samples with larger volumes collected for other constituents. The sampling design and objectives of the investigation should take this into consideration.

### Holding Times

Sample holding times are specified in the Analytical Support Branch *Laboratory Operations and Quality Assurance Manual* (ASBLOQAM), Most Recent Version. Field investigators should note that the holding time for an un-preserved VOC soil/sediment sample on ice is 48 hours. Arrangements should be made to ship the soil/sediment VOC samples to the laboratory by overnight delivery the day they are collected so the laboratory may preserve and/or analyze the sample within 48 hours of collection.



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## Percent Solids

Samplers must ensure that the laboratory has sufficient material to determine percent solids in the VOC soil/sediment sample to correct the analytical results to dry weight. If other analyses requiring percent solids determination are being performed upon the sample, these results may be used. If not, a separate sample (minimum of 2 oz.) for percent solids determination will be required. The sample collected for percent solids may also be used by the laboratory to check for preservative compatibility.

## Safety

Methanol is a toxic and flammable liquid. Therefore, methanol must be handled with all required safety precautions related to toxic and flammable liquids. Inhalation of methanol vapors must be avoided. Vials should be opened and closed quickly during the sample preservation procedure. Methanol must be handled in a ventilated area. Use protective gloves when handling the methanol vials. Store methanol away from sources of ignition such as extreme heat or open flames. The vials of methanol should be stored in a cooler with ice at all times.

## Shipping

Methanol and sodium bisulfate are considered dangerous goods, therefore shipment of samples preserved with these materials by common carrier is regulated by the U.S. Department of Transportation and the International Air Transport Association (IATA). The rules of shipment found in Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179) and the current edition of the IATA Dangerous Goods Regulations must be followed when shipping methanol and sodium bisulfate. Consult the above documents or the carrier for additional information. Shipment of the quantities of methanol and sodium bisulfate used for sample preservation falls under the exemption for small quantities.

The summary table on the following page lists the options available for compliance with SW846 Method 5035. The advantages and disadvantages are noted for each option. SESD's goal is to minimize the use of hazardous material (methanol and sodium bisulfate) and minimize the generation of hazardous waste during sample collection.



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**Table 1: Method 5035 Summary**

OPTION	PROCEDURE	ADVANTAGES	DISADVANTAGES
1	Collect two 40 mL vials with $\approx$ 5 grams of sample, and one 2 oz. glass jar w/septum lid for screening, % moisture and preservative compatibility.	Screening conducted by lab.	Presently a 48-hour holding time for unpreserved samples. Sample containers must be tared.
2	Collect three En Core® samplers, and one 2 oz. glass jar w/septum lid for screening, % solids.	Lab conducts all preservation/preparation procedures.	Presently a 48- hour holding time for preparation of samples.
3	Collect two 40 mL vials with 5 grams of sample and preserve w/methanol or sodium bisulfate, and one 2-oz. glass jar w/septum lid for screening, % solids .	High level VOC samples may be composited. Longer holding time.	Hazardous materials used in the field. Sample containers must be tared.
4	Collect one 2-oz. glass jar w/septum lid for analysis, % solids (high level VOC only).	Lab conducts all preservation/preparation procedures.	May have significant VOC loss.



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## **4 Manual Soil Sampling Methods**

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### **4.1 General**

These methods are used primarily to collect surface and shallow subsurface soil samples. Surface soils are generally classified as soils between the ground surface and 6 to 12 inches below ground surface. The most common interval is 0 to 6 inches; however, the data quality objectives of the investigation may dictate another interval, such as 0 to 3 inches for risk assessment purposes. The shallow subsurface interval may be considered to extend from approximately 12 inches below ground surface to a site-specific depth at which sample collection using manual collection methods becomes impractical.

If a thick, matted root zone, gravel, concrete, etc. is present at or near the surface, it should be removed before the sample is collected. The depth measurement for the sample begins at the top of the soil horizon, immediately following any removed materials.

When compositing, make sure that each composite location (aliquot) consist of equal volumes, i.e., same number of equal spoonfuls.

### **4.2 Spoons**

Stainless steel spoons may be used for surface soil sampling to depths of approximately 6 inches below ground surface where conditions are generally soft and non-indurated, and there is no problematic vegetative layer to penetrate.

#### ***4.2.1 Special Considerations When Using Spoons***

- When using stainless steel spoons, consideration must be given to the procedure used to collect the volatile organic compound sample. If the soil being sampled is cohesive and holds its in situ texture in the spoon, the En Core® Sampler or syringe used to collect the sub-sample for Method 5035 should be plugged directly from the spoon. If, however, the soil is not cohesive and crumbles when removed from the ground surface for sampling, consideration should be given to plugging the sample for Method 5035 directly from the ground surface at a depth appropriate for the investigation Data Quality Objectives.

### **4.3 Hand Augers**

Hand augers may be used to advance boreholes and collect soil samples in the surface and shallow subsurface intervals. Typically, 4-inch stainless steel auger buckets with cutting heads are used. The bucket is advanced by simultaneously pushing and turning using an attached handle with extensions (if needed).



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## ***4.3.1 Surface Soil Sampling***

When conducting surface soil sampling with hand augers, the auger buckets may be used with a handle alone or with a handle and extensions. The bucket is advanced to the appropriate depth and the contents are transferred to the homogenization container for processing. Observe precautions for volatile organic compound sample collection found in Section 3, Method 5035.

## ***4.3.2 Subsurface Soil Sampling***

Hand augers are the most common equipment used to collect shallow subsurface soil samples. Auger holes are advanced one bucket at a time until the sample depth is achieved. When the sample depth is reached, the bucket used to advance the hole is removed and a clean bucket is attached. The clean auger bucket is then placed in the hole and filled with soil to make up the sample and removed.

The practical depth of investigation using a hand auger depends upon the soil properties and depth of investigation. In sand, augering is usually easily performed, but the depth of collection is limited to the depth at which the sand begins to flow or collapse. Hand augers may also be of limited use in tight clays or cemented sands. In these soil types, the greater the depth attempted, the more difficult it is to recover a sample due to increased friction and torqueing of the hand auger extensions. At some point these problems become so severe that power equipment must be used.

## ***4.3.3 Special Considerations for Soil Sampling with the Hand Auger***

- Because of the tendency for the auger bucket to scrape material from the sides of the auger hole while being extracted, the top several inches of soil in the auger bucket should be discarded prior to placing the bucket contents in the homogenization container for processing.
- Observe precautions for volatile organic compound (VOC) sample collection found in Section 3, Method 5035. Collect the VOC sample directly from the auger bucket, if possible.
- Power augers, such as the Little Beaver® and drill rigs may be used to advance boreholes to depths for subsurface soil sampling with the hand auger. They may not be used for sample collection. When power augers are used to advance a borehole to depth for sampling, care must be taken that exhaust fumes, gasoline and/or oil do not contaminate the borehole or area in the immediate vicinity of sampling.
- When moving to a new sampling location, the entire hand auger assembly must be replaced with a properly decontaminated hand auger assembly.



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## **5 Direct Push Soil Sampling Methods**

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### **5.1 General**

These methods are used primarily to collect shallow and deep subsurface soil samples. Three samplers are available for use within the Division's direct push tooling inventory. All of the sampling tools involve the collection and retrieval of the soil sample within a thin-walled liner. The following sections describe each of the specific sampling methods that can be accomplished using direct push techniques, along with details specific to each method. While SESD currently uses the sample tooling described, tooling of similar design and materials is acceptable.

If gravel, concrete, etc. is present at or near the surface, it should be removed before the sample is collected. The depth measurement for the sample begins at the top of the soil horizon, immediately following any removed materials. Turf grass is not typically removed prior to sampling with these devices.

### **5.2 Large Bore® Soil Sampler**

The Large Bore® (LB) sampler is a solid barrel direct push sampler equipped with a piston-rod point assembly used primarily for collection of depth-discrete subsurface soil samples. The sample barrel is approximately 30-inches (762 mm) long and has a 1.5-inch (38 mm) outside diameter. The LB® sampler is capable of recovering a discrete sample core 22 inches x 1.0 inch (559 mm x 25 mm) contained inside a removable liner. The resultant sample volume is a maximum of 283 mL.

After the LB® sample barrel is equipped with the cutting shoe and liner, the piston-rod point assembly is inserted, along with the drive head and piston stop assembly. The assembled sampler is driven to the desired sampling depth, at which time the piston stop pin is removed, freeing the push point. The LB® sampler is then pushed into the soil a distance equal to the length of the LB® sample barrel. The probe rod string, with the LB® sampler attached, is then removed from the subsurface. After retrieval, the LB® sampler is then removed from the probe rod string. The drive head is then removed to allow removal of the liner and soil sample.

### **5.3 Macro-Core® Soil Sampler**

The Macro-Core® (MC) sampler is a solid barrel direct push sampler equipped with a piston-rod point assembly used primarily for collection of either continuous or depth-discrete subsurface soil samples. Although other lengths are available, the standard MC® sampler has an assembled length of approximately 52 inches (1321 mm) with an outside diameter of 2.2 inches (56 mm). The MC® sampler is capable of recovering a discrete sample core 45 inches x 1.5 inches (1143 mm x 38 mm) contained inside a removable liner. The resultant sample volume is a maximum of 1300 mL. The MC® sampler may be used



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in either an open-tube or closed-point configuration. Although the MC® sampler can be used as an open-barrel sampler, in SESD usage, the piston point is always used to prevent the collection of slough from the borehole sides.

## 5.4 Dual Tube Soil Sampling System

The Dual Tube 21 soil sampling system is a direct push system for collecting continuous core samples of unconsolidated materials from within a sealed outer casing of 2.125-inch (54 mm) OD probe rod. The samples are collected within a liner that is threaded onto the leading end of a string of 1.0-inch diameter probe rod. Collected samples have a volume of up to 800 mL in the form of a 1.125-inch x 48-inch (29 mm x 1219 mm) core. Use of this method allows for collection of continuous core inside a cased hole, minimizing or preventing cross-contamination between different intervals during sample collection. The outer casing is advanced, one core length at a time, with only the inner probe rod and core being removed and replaced between samples. If the sampling zone of interest begins at some depth below ground surface, a solid drive tip must be used to drive the dual tube assembly and core to its initial sample depth.

## 5.5 Special Considerations When Using Direct Push Sampling Methods

- *Liner Use and Material Selection* – Direct Push Soil Samples are collected within a liner to facilitate removal of sample material from the sample barrel. The liners may only be available in a limited number of materials for a given sample tool, although overall, liners are available in brass, stainless steel, cellulose acetate butyrate (CAB), polyethylene terephthalate glycol (PETG), polyvinyl chloride (PVC) and Teflon®. For most SESD investigations, the standard polymer liner material for a sampling tool will be acceptable. When the study objectives require very low reporting levels or unusual contaminants of concern, the use of more inert liner materials such as Teflon® or stainless steel may be necessary.
- *Sample Orientation* – When the liners and associated sample are removed from the sample tubes, it is important to maintain the proper orientation of the sample. This is particularly important when multiple sample depths are collected from the same push. It is also important to maintain proper orientation to define precisely the depth at which an aliquot was collected. Maintaining proper orientation is typically accomplished using vinyl end caps. Convention is to place red caps on the top of the liner and black caps on the bottom to maintain proper sample orientation. Orientation can also be indicated by marking on the exterior of the liner with a permanent marker.
- *Core Catchers* – Occasionally the material being sampled lacks cohesiveness and is subject to crumbling and falling out of the sample liner. In cases such as these, the use of core catchers on the leading end of the sampler may help



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retain the sample until it is retrieved to the surface. Core catchers may only be available in specific materials and should be evaluated for suitability. However, given the limited sample contact that core-catchers have with the sample material, most standard core-catchers available for a tool system will be acceptable.

- *Decontamination* – The cutting shoe and piston rod point are to be decontaminated between each sample, using the procedures specified for the collection of trace organic and inorganic compounds found in Field Equipment and Decontamination – SESDPROC-205, most recent version. Within a borehole, the sample barrel, rods, and drive head may be subjected to an abbreviated cleaning to remove obvious and loose material, but must be cleaned between boreholes using the procedures specified for downhole drilling equipment in Field Equipment and Decontamination – SESDPROC-205, most recent version.
- *Decommissioning* – Boreholes must be decommissioned after the completion of sampling. Boreholes less than 10 feet deep that remain open and do not approach the water table may be decommissioned by pouring 30% solids bentonite grout from the surface or pouring bentonite pellets from the surface, hydrating the pellets in lifts. Boreholes deeper than 10 feet, or any borehole that intercepts groundwater, must be decommissioned by pressure grouting with 30% solids bentonite grout, either through a re-entry tool string or through tremie pipe introduced to within several feet of the borehole bottom.
- *VOC Sample Collection* – Observe precautions for volatile organic compound sample collection found in Section 3 of this procedure.



## **6 Split Spoon/Drill Rig Methods**

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### **6.1 General**

Split spoon sampling methods are used primarily to collect shallow and deep subsurface soil samples. All split spoon samplers, regardless of size, are basically split cylindrical barrels that are threaded on each end. The leading end is held together with a beveled threaded collar that functions as a cutting shoe. The other end is held together with a threaded collar that serves as the sub used to attach the spoon to the string of drill rod. Two basic methods are available for use, including the smaller diameter standard split spoon, driven with the drill rig safety hammer, and the larger diameter continuous split spoon, advanced inside and slightly ahead of the lead auger during hollow stem auger drilling. The following sections describe each of the specific sampling methods, along with details specific to each method.

If gravel, concrete, etc. is present at or near the surface, it should be removed before the sample is collected. The depth measurement for the sample begins at the top of the soil horizon, immediately following any removed materials. Turf grass is not typically removed prior to sampling with these devices.

### **6.2 Standard Split Spoon**

A drill rig is used to advance a borehole to the target depth. The drill string is then removed and a standard split spoon is attached to a string of drill rod. Split spoons used for soil sampling must be constructed of stainless steel and are typically 2.0-inches OD (1.5-inches ID) and 18-inches to 24-inches in length. Other diameters and lengths are common and may be used if constructed of the proper material. After the spoon is attached to the string of drill rod, it is lowered into the borehole. The safety hammer is then used to drive the split spoon into the soil at the bottom of the borehole. After the split spoon has been driven into the soil, filling the spoon, it is retrieved to the surface, where it is removed from the drill rod string and opened for sample acquisition.

### **6.3 Continuous Split Spoon**

The continuous split spoon is a large diameter split spoon that is advanced into the soil column inside a hollow stem auger. Continuous split spoons are typically 3 to 5 inches in diameter and either 5 feet or 10 feet in length, although the 5-foot long samplers are most common. After the auger string has been advanced into the soil column a distance equal to the length of the sampler being used it is returned to the surface. The sampler is removed from inside the hollow stem auger and the threaded collars are removed. The split spoon is then opened for sampling.



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## 6.4 Special Considerations When Using Split Spoon Sampling Methods

- Always discard the top several inches of material in the spoon before removing any portion for sampling. This material normally consists of borehole wall material that has sloughed off of the borehole wall after removal of the drill string prior to and during inserting the split spoon.
- Observe precautions for volatile organic compound sample collection found in Section 3, Method 5035.



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## 7 Shelby Tube/Thin-Walled Sampling Methods

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### 7.1 General

Shelby tubes, also referred to generically as thin-walled push tubes or Acker thin-walled samplers, are used to collect subsurface soil samples in cohesive soils and clays during drilling activities. In addition to samples for chemical analyses, Shelby tubes are also used to collect relatively undisturbed soil samples for geotechnical analyses, such as hydraulic conductivity and permeability, to support hydrogeologic characterizations at hazardous waste and other sites.

If gravel, concrete, etc. is present at or near the surface, it should be removed before the sample is collected. The depth measurement for the sample begins at the top of the soil horizon, immediately following any removed materials. Turf grass is not typically removed prior to sampling with this device.

### 7.2 Shelby Tube Sampling Method

A typical Shelby tube is 30 inches in length and has a 3.0-inch OD (2.875-inch ID) and may be constructed of steel, stainless steel, galvanized steel, or brass. They also typically are attached to push heads that are constructed with a ball-check to aid in holding the contained sample during retrieval. If used for collecting samples for chemical analyses, it must be constructed of stainless steel. If used for collecting samples for standard geotechnical parameters, any material is acceptable.

To collect a sample, the tube is attached to a string of drill rod and is lowered into the borehole, where the sampler is then pressed into the undisturbed material by hydraulic force. After retrieval to the surface, the tube containing the sample is then removed from the sampler head. If samples for chemical analyses are needed, the soil contained inside the tube is then removed for sample acquisition. If the sample is collected for geotechnical parameters, the tube is typically capped, maintaining the sample in its relatively undisturbed state, and shipped to the appropriate geotechnical laboratory.

### 7.3 Special Considerations When Using Split Spoon Sampling Methods

Observe precautions for volatile organic compound sample collection found in Section 3, Method 5035.



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## **8 Backhoe Sampling Method**

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### **8.1 General**

Backhoes may be used in the collection of surface and shallow subsurface soil samples. The trenches created by excavation with a backhoe offer the capability of collecting samples from very specific intervals and allow visual correlation with vertically and horizontally adjacent material. If possible, the sample should be collected without entering the trench. Samples may be obtained from the trench wall or they may be obtained directly from the bucket at the surface. The following sections describe various techniques for safely collecting representative soil samples with the aid of a backhoe.

The depth measurement for the sample begins at the top of the soil horizon.

### **8.2 Scoop-and-Bracket Method**

If a sample interval is targeted from the surface, it can be sampled using a stainless steel scoop and bracket. First a scoop and bracket are affixed to a length of conduit and is lowered into the backhoe pit. The first step is to take the scoop and scrape away the soil comprising the surface of the excavated wall. This material likely represents soil that has been smeared by the backhoe bucket from adjacent material. After the smeared material has been scraped off, the original stainless steel scoop is removed and a clean stainless steel scoop is placed on the bracket. The clean scoop can then be used to remove sufficient volume of soil from the excavation wall to make up the required sample volume.

### **8.3 Direct-from-Bucket Method**

It is also possible to collect soil samples directly from the backhoe bucket at the surface. Some precision with respect to actual depth or location may be lost with this method but if the soil to be sampled is uniquely distinguishable from the adjacent or nearby soils, it may be possible to characterize the material as to location and depth. In order to ensure representativeness, it is also advisable to dress the surface to be sampled by scraping off any smeared material that may cross-contaminate the sample.

### **8.4 Special Considerations When Sampling with a Backhoe**

- Do not physically enter backhoe excavations to collect a sample. Use either procedure 8.2, Scoop-and-Bracket Method, or procedure 8.3, Direct-from-Bucket Method to obtain soil for sampling.
- Smearing is an important issue when sampling with a backhoe. Measures must be taken, such as dressing the surfaces to be sampled (see Section 2.3), to mitigate problems with smearing.



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- Paint, grease and rust must be removed and the bucket decontaminated prior to sample collection.
- Observe precautions for volatile organic compound sample collection found in Section 3, Method 5035.