

**SAMPLING & ANALYSIS PLAN FOR
GROUNDWATER MONITORING**

**OMNISOURCE SOUTHEAST
INDUSTRIAL LANDFILL
KERNERSVILLE, NORTH CAROLINA**

OCTOBER 2011

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GROUNDWATER MONITORING PROGRAM
OMINSOURCE SOUTHEAST LANDFILL
KERNERSVILLE, NORTH CAROLINA

1.0 INTRODUCTION

The OmniSource Southeast facility in Kernersville, North Carolina includes a private industrial landfill permitted by North Carolina for the disposal waste from the metals recycling operation. The landfill was established in the early 1970's for the disposal of waste from the metal shredding process (shredder residue). Exhibit No. 1 provides a location map of the facility.

The original monitoring well network at the OmniSource facility consisted of four wells (MW-1, MW-2, MW-3, and MW-4) which were installed in 1989. The upgradient well for the monitoring network was MW-1. It was located just west of the active scrap processing yard in order to provide protection for the well and to be sure the well was monitoring background conditions. The other three wells are downgradient wells and were installed close to the toe of the landfill. The locations of these wells were selected after consultation with the staff of the Solid Waste Section of the Department of Environment and Natural Resources (NCDENR). One significant criteria for the selection of well locations was accessibility. There were some old, generally unmaintained, logging roads on the property north and east of the landfill. Due to the steepness of the terrain and the property boundaries existing at the time, downgradient wells MW-3 and MW-4 were positioned very close to the toe of the landfill. The location for MW-2 was selected based on accessibility from the logging road on the east side of the landfill.

In 2001, another downgradient well, MW-4D, was installed. This well was deeper than the adjacent wells being screened at a depth of 58 to 68 feet BGS. This well was installed to evaluate possible vertical changes in water quality. At the same time that this well was installed, well MW-1R was installed to replace MW-1. This replacement was necessary to protect the well from expanded scrap processing activities close to MW-1. Beginning in 2001, MW-4D was sampled in place of MW-4.

The existing monitoring well network was sampled on a semiannual basis from 1990 (except when the site was closed due to bankruptcy by a former owner) until the initiation of the landfill mining operation.

2.0 PROPOSED CHANGES IN MONITORING WELL NETWORK

At present, the material in the landfill is being reprocessed to recover buried metal using technology which was unavailable at the time the shredder residue was generated. As the material is placed back in the landfill, it is being configured in such a way to augment final closure of the landfill. In preparation for the final closure of the landfill, a significant modification to the groundwater monitoring network is being proposed.

- Two new monitoring wells will be installed inside the compliance boundary close to the existing natural gas pipeline easement (see Exhibit No. 2). Because the landfill was permitted prior to 1983, the compliance boundary established by the Subchapter 2L rules is 500 feet rather than the 250 feet established for new landfills.
- Monitoring well MW-1R will be abandoned.
- A replacement upgradient well will be installed at the location shown on Exhibit No.2.
- An evaluation of MW-2 will be made to determine if it can be used as part of the monitoring network. If the well is still serviceable, it will be included in the network. If it is damaged or has experienced deterioration, it will be replaced with a new well.

All new monitoring wells will be 2" PVC casings with the top of the PVC casing extended to about two feet above the surrounding ground elevation. A steel protective casing with lock will be installed around each PVC casing. The elevation of the top of the PVC casing for each well will be surveyed by a licensed surveyor.

Well completion reports for the new wells, including information on the specific site geology, will also be submitted to NCDENR.

After the new wells are installed, the monitoring well network will be sampled on a semiannual schedule.

3.0 SAMPLING GUIDANCE AND FIELD RECORDS

All sampling and analysis shall be in accordance with the guidance and methods contained in *North Carolina Administrative Code T10.10G.0601-.0602*; *EPA/SW-846*, latest edition; *EPA Groundwater Enforcement Guidance Document*; *Standard Operating Procedures and Quality Assurance Manual*, EPA Environmental Services Division.

Personnel involved in collection of groundwater samples shall keep an up-to-date field notebook which contains the following information:

- ▶ Identification of well
- ▶ Well depth
- ▶ Static water level and measurement technique
- ▶ Presence of immiscible layer and detection method
- ▶ Well purging procedure and equipment
- ▶ Sample withdrawal procedure and equipment
- ▶ Date and time of sample collection
- ▶ Well sampling sequence
- ▶ Types of containers used and sample identification numbers
- ▶ Preservatives used
- ▶ Parameters requested for analysis
- ▶ Field analysis data
- ▶ Sample distribution and transport
- ▶ Field observations on sampling event
- ▶ Name of collector

4.0 WATER LEVEL & DEPTH MEASUREMENT PROCEDURES

4.1. Scope

The procedure described below outlines the method of obtaining water level measurements in the monitoring wells. The preferred method for measurements includes the use of a conducting probe for water level and a weighted tape for the well depth.

4.2. Summary of Method

The electronic water level indicator is an instrument with a conducting probe attached to a calibrated tape. The probe is lowered carefully into the well casing. When the probe contacts the water a circuit is completed activating a light, a buzzer or a meter. The depth to water is determined by reading the appropriate increment on the tape. Note: groundwater with dilute ionic content may not conduct enough current between electrodes at the normal setting. Instruments with adjustable sensitivity are preferred.

4.3. Procedures

1. Unlock and open well. Note the condition of the well and the protective casing. Don clean gloves.
2. Record well number, date, time, weather conditions, and any other well specific information.
3. Locate reference mark at top of casing.
4. If reference mark is not present on well casing, sampler should place a permanent mark on the casing. Note: the new mark will have to be surveyed to accurately determine its elevation.
5. Clean the probe on the electronic water level indicator. Check the battery and the light, buzzer or meter.
6. Lower the probe into the well making sure the tape on the probe does not become tangled or unnecessarily scrapes the sides of the well casing.
7. When the instrument indicates that the probe has contacted water, the sampler should stop lowering the probe.
8. Pull the probe up until the contact is broken.
9. Slowly lower the probe again stopping the instant the instrument indicates that the probe has contacted water.
10. Hold the calibrated tape to the side of the casing where the reference mark is located.
11. Mark the tape with thumb where it touches the reference mark.
12. Use a measuring device to determine the distance from the last mark on the tape to the spot indicated by the thumb. The distance indicated is the depth from the reference mark to the water level.
13. Record the measurement to the nearest 0.01 ft. as the "depth to water" in the field log book.
14. Repeat steps 6 - 13 three times for consistency.
15. Subtract the distance from the reference mark to the water level from the elevation of the reference mark to determine the elevation of the groundwater.
16. After each measurement, rinse the probe with deionized water to avoid possible cross contamination.

The depth of each monitoring well shall be determined each time a sampling event is conducted. The following procedures shall be used to determine the total well depth:

1. Lower a weighted measuring tape until it strikes bottom.
2. Measure and record the distance from the well bottom to the top of the well casing, recording the reading to the nearest 0.01 ft.
3. After each measurement rinse the weighted tape with deionized water to avoid possible cross contamination.

All procedures should be initiated with the upgradient or background well. Any departure from the procedures itemized above shall be documented in the field log book.

5.0 DETECTION AND SAMPLING OF IMMISCIBLE LAYERS

5.1. Scope/Applications

This procedure covers the methods used to detect and sample immiscible layers. If a facility has a release containing chemical constituents that are insoluble and that have special gravities either greater or less than that of water, then that facility's sampling and analysis plan must address immiscible layers.

5.2. Summary of Method

The presence of organic vapors should be determined by the use of either a photoionization analyzer or an organic vapor analyzer. The presence of organic vapor may indicate a floating layer on the surface of the groundwater. An interface probe is used to determine the existence of a floating layer. A bailer is then used to sample the floating layer. If a sinker exists a double valve bailer is lowered to the bottom of the well in order to sample the layer.

5.3. Comments

Sampling of the immiscible layer must take place prior to purging. If the floating layer is greater than 2 feet thick then a bottom valve bailer should be used. If the floating layer is less than 2 feet thick but less than 25 feet from the surface then a peristaltic pump should be used. If the floating layer is less than 2 feet thick but more than 25 feet from the surface then an open top closed bottom bailer should be used. A double valve bailer should be used for immiscible layers that are sinkers. Detection and sampling of immiscible layers must be done prior to purging.

5.4. Procedures

1. Locate well and record well number, site, date, and well condition in log book.
2. Use plastic sheeting as necessary to prevent equipment from coming in contact with potentially contaminated surfaces. Don rubber gloves.
3. Remove the locking and protective caps.
4. Sample the air in the well head for organic vapors using either a photoionization analyzer or an organic vapor analyzer, and record measurements.
5. Determine the static liquid level using a water level indicator and record the depth in the log book.
6. Lower an interface problem into the well to determine the existence of any immiscible layer(s), light and/or dense.
7. Remove clean bailer from protective covering, attach cord, type of bailer used will be determined by immiscible layer being sampled. (See comments)
8. Lower bailer slowly to the interval from which the sample is to be collected. If the sample interval is a floating layer only a few inches thick then the open top bailer should be lowered to the top of the immiscible layer and an additional half thickness of the immiscible layer.
9. Raise bailer to surface, feeding cord into container, reel or onto clean plastic sheeting. Do not allow bailer cord to contact ground.

10. Remove the cap from the sample bottle, and tilt the bottle slightly.
11. Pour the sample slowly down the inside of the sample bottle. Avoid splashing of the sample. Assure that any suspended matter in the sample is transferred quantitatively to the sample bottle.
12. Leave adequate air space in the bottle to allow for expansion, except for VOA flasks.
13. Label the bottle carefully and clearly. Enter all information accurately, and check to be sure it is legible.
14. Samples will be placed in containers defined according to the need, and then, when appropriate, packed with ice or ice packs in coolers as soon as practical. Packing, labeling, and preparation for shipment procedures will follow procedures as specified in the Sampling and Analysis Plan.
15. Complete field log book and chain-of-custody forms in accordance with the S and A Plan.
16. Replace well cap and lock.

6.0. WELL PURGING PROCEDURE

6.1. Scope and Application

The procedure covers the purging of water from a well prior to sampling so that the sample is representative of the formation groundwater. The device used (bailer or pump) depends upon aquifer properties, individual well construction and data quality objectives.

6.2. Summary of Method

Well construction information is gathered prior to beginning purging. Water level is measured to calculate the volume of water present in the well. Purging is completed using a calculated number of volumes and/or field measurements to determine the end point.

6.3. Comments

Prior to sampling, each well shall be purged of all standing water. Each well shall either be pumped to dryness or at least three (3) well volumes of water removed.

Rate of purging should be regulated to minimize agitation of the ground water. If using a bailer to purge the well, lower and raise it slowly so as not to agitate the water in the well.

6.4. Procedures

1. Obtain the following information about well.
 - Well location
 - Diameter(s) of well
 - Depth of well
 - Screen interval(s)
2. Determine method to be used to purge well (i.e., pump or bailer).

3. Calibrate instruments according to manufacturer's instrument calibration and maintenance manual, if applicable.
4. Locate well and record well number, site, date and well condition in log book.
5. Unlock and open well after placing plastic sheeting on ground. Don rubber gloves.
6. Use know well depth information to determine the height of water column in well. Subtract distance to water level from depth of well to get the length of water column. Record all information in field log book.
Depth of well - distance to water level = length of water column
7. Measure initial pH/specific conductance/temperature to evaluate water quality.
8. Purge well of required volumes after calculating volume of water in well.
 - a. The formula for calculating the volume in gallons of water in the well casing or sections of telescoping well casing is as follows:

$$(\pi r^2 h) 7.481 = \text{gallons; where } \pi = 3.142$$

r = radius of the well pipe in feet

h = linear feet of water in well

7.481 = gallons per cubic foot of water

- b. Calculation of the volume of water in typical well casing may be done as follows:
 - 1) 2" dia. well:
0.1632 gal/ft. x ____ (linear ft. of water) = gal.
 - 2) 4" dia. well:
0.6528 gal/ft. x ____ (linear ft. of water) = gal.
 - 3) 6" dia. well:
1.4688 gal/ft. x ____ (linear ft. of water) = gal.
9. The well purging end point will be when 3 volumes have been removed from the well.
 - a. Purge one well volume, then begin measuring field parameters once during each well volume.
 - b. Purge a total of at least 3 well volumes.
10. Purge 3 well volumes or to dryness only if sufficient water is not present to yield required purge volumes.
11. Record all purge times and rates of well evacuation in field log book.
12. When all necessary procedures are complete lock well, clean area and dispose of refuse.

7.0. SAMPLE COLLECTION PROCEDURES

All monitoring wells shall be sampled in accordance with the methods of EPA/SW-846, latest edition, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". Samples shall be collected by the facility or their agents under the supervision of the Company's Environmental Supervisor.

7.1. Sampling with a Bailer (To be used only as a backup to sampling pump)

7.1.1. *Scope and Application*

This procedure describes the use of a bailer (hollow, cylindrical tube) for collecting groundwater samples. Groundwater samples may be used to obtain physical, chemical, or radiological data.

7.1.2. *Summary of Method*

A bailer is lowered by cord into the groundwater where it fills. The bailer is withdrawn, and its contents are drained into the appropriate containers.

7.1.3. *Comments*

1. Only bottom loading stainless steel or Teflon bailers will be used. PVC may be permitted depending on parameters.
2. Bailers are economical and convenient enough that a separate bailer may be dedicated to each well to minimize cross contamination.
3. Only new, clean cord will be used.
4. A reel upon which the cord may be wound is helpful in lowering and raising the bailer. It also reduces chance of contamination.
5. Bailers constructed with adhesive joints may not be used.

7.1.4. *Procedures*

1. Record sampling station number, sample I.D., date, time, weather conditions, and any other well specific, pertinent information (i.e., water level, presence of product in log book).
2. Place plastic sheeting around well and work area.
3. Unlock and remove well cap.
4. Collect water level measurements by method outlined in Part A of the S and A Plan and record in log book. Remove clean bailer from protective covering attach cord allowing enough length for bailer to reach bottom of well.
5. Lower bailer slowly to the interval from which the sample is to be collected.
6. Allow bailer to fill with a minimum of surface disturbance in order to prevent sample water aeration.
7. Raise bailer to surface, feeding cord into container, reel or onto clean plastic sheeting.

8. Do not allow bailer cord to contact ground.
9. Remove the cap from the sample bottle, and tilt the bottle slightly.
10. Pour the sample slowly down the inside of the sample bottle. Avoid splashing of the sample. Assure that any suspended matter in the sample is transferred quantitatively to the sample bottle. Properly dispose of all excess water collected in bailer.
11. Leave adequate air space in the bottle to allow for expansion, except for VOA flasks.
12. Label the bottle carefully, and clearly. Enter all information accurately, and check to be sure it is legible.
13. Samples will be placed in containers defined according to the needs, and then, when appropriate, packed with ice in coolers as soon as practical. Packaging, labeling, and preparation for shipment procedures will follow procedures as specified in the Sampling and Analysis Plan.
14. Complete field log book and chain-of-custody forms in accordance with the S and A Plan.
15. Replace bailer is dedicated, replace well cap and lock.

7.2. Sampling with an Electric Powered Centrifugal Pump

7.2.1. *Scope and Application*

This procedure discusses collection of groundwater samples using a single stage, centrifugal sampling pump specifically designed for environmental groundwater sampling.

7.2.2. *Summary of Method*

An electric centrifugal pump can be either dedicated to a well or cleaned/decontaminated before use. New Tygon tubing is attached to the pump. The pump is lowered into the well to a depth just above the screened interval.

7.2.3. *Comments*

If the centrifugal pump speed can be varied to reduce the flow to a “micro purge” rate, the pump can be used to collect samples for volatile organic analysis or total organic halogen analysis (TOX). If outgasing is of concern, this method may not be appropriate.

7.2.4. *Procedures*

1. Locate well and record number, site, date, and well condition in field log book.
2. Use plastic sheeting as necessary to prevent equipment from coming in contact with potentially contaminated surfaces.
3. Unlock and open well.
4. Collect water level measurements by method outlined in Part A of the S and A Plan and record in log book.
5. Lower pump in well to desired level, if pump is not dedicated.
6. Check control box for proper connections.
7. When a pump is used for purging, measure the amount of water discharged with a container of known volume, if capacity of pumped well is unknown, and

- calculate purge time for the required purge volume. Refer to the S and A Plan for well purging.
8. Obtain and record required measurements of the well water, (i.e., pH, specific conductance and temperature, and other parameters that may be specified in the Sampling and Analysis Plan).
 9. Remove the cap from the sample bottle, and tilt the bottle slightly.
 10. Pour the sample slowly down the inside of the sample bottle. Avoid splashing of the sample. Assure that any suspended matter in the sample is transferred quantitatively to the sample bottle.
 11. Leave adequate air space in the bottle to allow for expansion. The exception to this statement are VOA vials, which should be collected by bailer, and are filled to overflowing and capped.
 12. Label the bottle carefully and clearly. Enter all information accurately, and check to be sure it is legible.
 13. Samples will be placed in containers defined according to the needs, and then, when appropriate, packed with ice in coolers as soon as practical. Packaging, labeling, and preparation in the S and A Plan.
 14. Complete field log book and chain-of-custody forms in accordance with the S and A Plan.
 15. If not dedicated, remove pump, close well cap and lock.

7.3. Sampling with a Bladder Pump

7.3.1. *Scope and Application*

This procedure discusses collection of groundwater samples using the bladder pump. The water samples may be used to obtain physical, chemical, or radiological data.

7.3.2. *Summary of Method*

A bladder pump is either dedicated to a well, or cleaned before use. The pump is placed in the well prior to sample collection. A compressed air source forces air through a control box which regulated timed intervals of air discharged into, and air escapes from, the bladder pump, along with air intake pressure. The bladder expands and contracts with air intake and escape, and thereby forces water to the head of the well where it is collected.

7.3.3. *Comments*

Because there is little aeration or agitation of the water, the bladder pump can be used to collect samples for volatile organic analysis.

7.3.4. *Procedures*

1. Locate well and record well number, site, date, and well condition in log book.
2. Use plastic sheeting as necessary to prevent equipment from coming in contact with potentially contaminated surfaces. Don rubber gloves.

3. Unlock and open well.
4. Collect water level measurements by method outlined in S and A Plan, and record in log book.
5. Attach air lines, samples lines and lifting lines to pump. Lifting lines should bear the weight of the pump with air and sample lines attached to lifting lines approximately every 10 feet with appropriate inert devices.
6. Lower pump in well to desired level, if pump is not dedicated.
7. Connect air lines from regulated compressed gas source to control box.
8. Connect battery, if required.
9. Start air flow.
10. Adjust flow rate with throttle knob found on control box.
11. To control discharge and refill cycle rate of the bladder, use the discharge and refill control knobs located on control box.
12. Equal length discharge and refill cycles are generally desirable, but individual well conditions may dictate otherwise.
13. When a bladder pump is used for purging, measure the amount of water discharged with a container of known volume, and calculate purge time for the required purge volume.
14. Obtain and record required measurements of the well water, (i.e., specific conductance, temperature and other measurements as require by the Sampling and Analysis Plan).
15. Remove the cap from the sample bottle, and tilt the bottle slightly.
16. Pour the sample slowly down the inside of the sample bottle. Avoid splashing the sample.
17. Leave adequate air space in the bottle to allow for expansion, except for VOA vials which are filled to overflowing and capped.
18. Label the bottle carefully and clearly. Enter all information in the log book accurately, and check to be sure it is legible.
19. Samples will be placed in containers defined according to the needs, and then, when appropriate, packed with ice in coolers as soon as practical. Packaging, labeling, and preparation for the shipment procedures will follow procedures as specified in the S and A Plan.
20. Complete field log book and chain-of-custody forms in accordance with The S and A Plan.
21. If pump is not dedicated, remove from well.
22. Replace well cap and lock.

8.0. FIELD MEASUREMENT PROCEDURES

8.1. Temperature

8.1.1. *Scope and Application*

This procedure is applicable to ground, surface, and saline waters.

8.1.2. *Summary of Method*

Temperature measurements may be made with any calibrated high quality mercury-filled thermometer or thermometer with analog or digital readout device.

8.1.3 *Comments*

For field operations using a glass thermometer, the thermometer will be transported in a protective case to prevent breakage. Thermometers of thermometer used with this procedure require calibration with a certified NBS thermometer.

8.1.4 *Procedure*

1. Use only mercury-filled thermometer or thermistor that is in calibration.
2. Inspect thermometer before each field trip to ensure that there are neither cracks in the glass, nor air spaces or bubbles in the mercury.
3. Allow thermometer or thermistor enough time to equilibrate to outside temperature when removed from a field vehicle.
4. Insert thermometer or thermistor in-situ when possible, or in a grab sample. Swirl the thermometer or thermistor in the sample, and take the temperature reading when the mercury column or digital readout stabilizes; record temperature in field log book to the nearest 0.5°C or 1.0 °C, depending on need.

8.1.5. *Control of Deviations*

When feasible, any departure from specific requirements will be justified and authorized prior to deviating from the requirements. Deviations shall be sufficiently documented to allow repetition of the activity as actually performed.

8.1.6. *Calibration*

Each temperature measurement device will be initially calibrated at three temperatures covering the range of the device against a National Bureau of Standards (NBS) certified thermometer, and then cross-checked against a calibrated NBS certified thermometer at least semiannually.

8.2. pH (Hydrogen Ion Concentration)

8.2.1. *Scope and Application*

This procedure is applicable to ground, surface, and saline waters.

8.2.2. *Summary of Method*

The pH of a sample is determined electrometrically using either a glass electrode in combination with a reference potential, or a combination electrode and a pH meter.

8.2.3. *Comments*

Coatings of oily material or particulate matter can impair electrode response. Remove these

coatings by gentle wiping with a clean tissue followed by a distilled water rinse. Temperature effects on the electrometric measurement of pH are controlled by using instruments having temperature compensation or by calibrating the electrode meter system at the temperature of the sample.

8.2.4. Procedure

1. Prior to field activity check meter for mechanical and electrical failures, weak batteries, and cracked or fouled electrodes. Check pH recorders for recording and time scale accuracy.
2. Following instructions provided with each type of meter, test the meter against standard buffer solutions before using. Thereafter, the meter can be checked periodically against two buffers that bracket the expected value of the sample. Use a fresh aliquot of buffer solution for each measurement. Multi-range pH paper may be used to determine expected value.
3. For pH meter without automatic temperature compensation, bring the sample and buffer to same temperature, if possible. If the sample temperature differs more than 20c from the buffer solutions, adjust for temperature difference.
4. Thoroughly rinse the electrode with distilled water and remove excess water between immersion in each buffer solution and sample.
5. Immerse the electrode in-situ when possible. If it is necessary to measure pH on a portion of the sample swirl the electrode at a constant rate until the meter reading reaches equilibrium. The rate of stirring used should minimize the air transfer rate of the air-water interface of the sample.
6. Note and record sample pH to the nearest 0.1 pH unit; repeat measurement on successive volumes of sample or in-situ until values differ by no less than 0.1 pH unit. Two or three volumes are usually sufficient.
7. For samples of high ionic strength, condition electrodes after cleaning by dipping them into sample for one minute, immerse in fresh portion of the same sample, and read pH.
8. For dilute, poorly buffered solutions, equilibrate electrodes by immersing in three or four successive portions of sample. Take a fresh sample to measure pH.
9. Turn off meter at last reading.
10. Rinse electrodes thoroughly with distilled water and store in appropriate storage solution as described in operating instructions for the specific meter or electrode.
11. Record data in notebook, per S and A Plan, and complete Chain-of-Custody forms.

5. Control of Deviations

When feasible, any departure from specified requirements will be justified and authorized prior to deviating from the requirements. Deviations shall be sufficiently documented to allow repetition of the activity as actually performed.

9.0. PACKAGING ENVIRONMENTAL SAMPLES FOR TRANSPORTATION

9.1. Scope and Application

This section describes the minimum procedure required to properly package containers for environmental samples to assure safe transport and to prevent degradation of sample quality. It outlines the general requirements to be followed for samples collected in the course of field investigations and monitoring activities. It applies to environmental samples as defined in Title 40 of the Code of Federal Regulations, Part 261.4, Paragraph (d); and Title 10, Part 71, Subpart B.

9.2. Summary of Method

Individual sample containers will be checked against accompanying chain-of-custody forms and analytical request forms prior to signing for receipt of the samples. Samples will be placed in strong exterior shipping packages and surrounded with compatible cushioning/absorbent material if necessary. The shipping package will be labeled and marked as per DOT regulations and restrictions of the carrier or receiver.

9.3. Comments

The sampling crew should contact carriers and receivers prior to packaging to ascertain any specific restrictions, such as weight limits, delivery and pick-up schedules, receiving hours, or sample disposal terms.

10.0. CHEMICAL ANALYSIS PROCEDURE

10.1. Selection of Analytical Method

For most of the analytical parameters to be measured, there is usually more than one analytical method that may be applied from those approved by the regulatory agencies. Selecting the appropriate method involves assessing the characteristics of each sample, the intended use of the data obtained from the analysis, and the limitations imposed by the laboratory facility.

To select the most appropriate method for analysis, the following factors should be considered:

1. Physical state of the sample
2. Anticipated concentration of analysis
3. Required detection limit
4. Data quality objectives (DQO)
5. Regulatory requirements

10.2. Order of Sample Collection

Collection of samples should generally be in the order of sensitivity of volatilization. The following list is arranged by sensitivity of volatilization:

- Volatile organics (VOA)
- Purgeable organic carbon (POC)
- Total organic halogens (TOX)
- Total organic carbon (TOC)
- Extractable organics
- Total metals
- Dissolved metals
- Phenols
- Cyanide
- Sulfate & chloride
- Turbidity
- Nitrate & ammonia
- Radionuclides

10.3. Required Parameters for Analysis

Total Metals

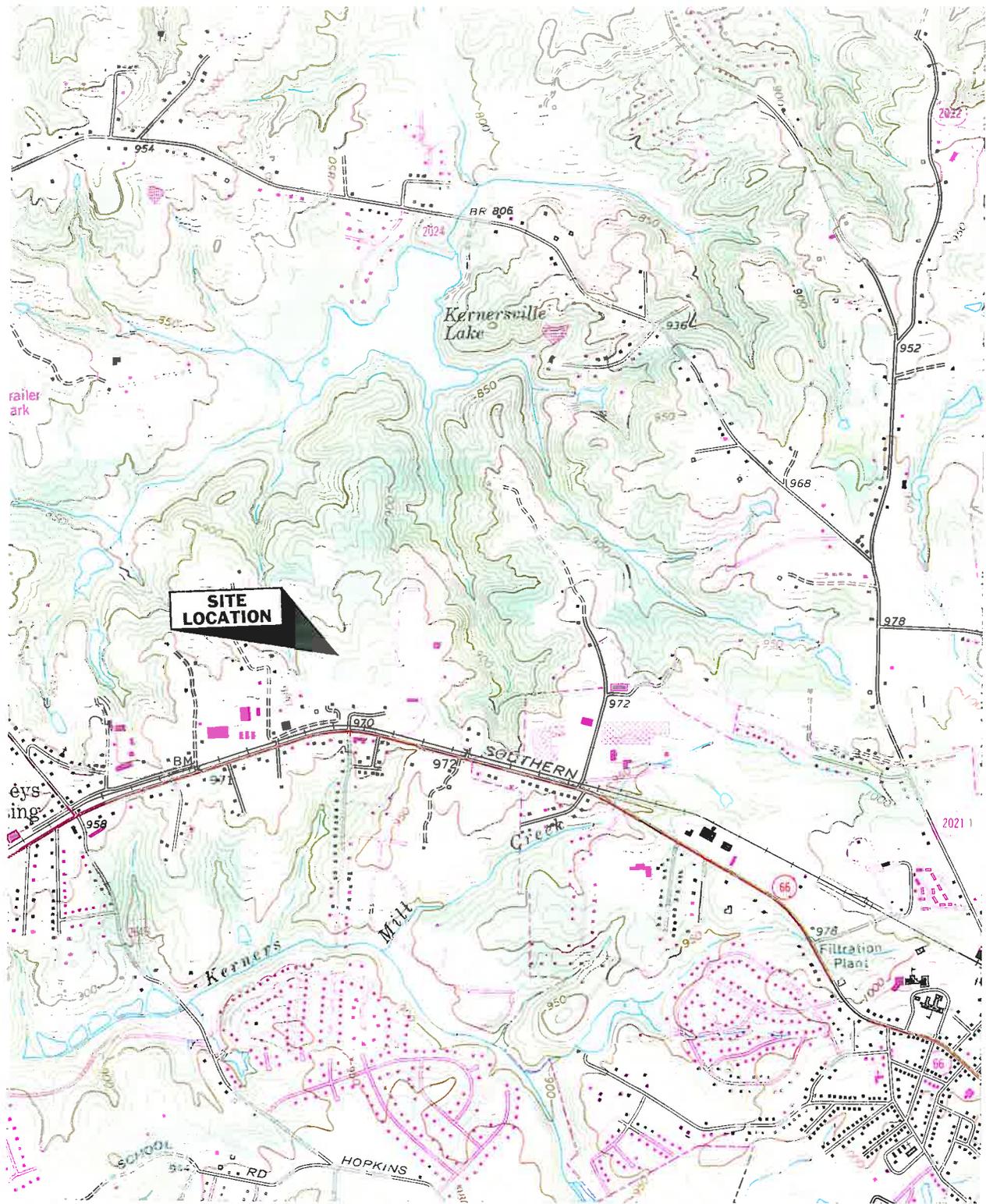
Antimony	Arsenic
Beryllium	Barium
Cadmium	Chromium
Cobalt	Copper
Lead	Nickel
Selenium	Silver
Thallium	Vanadium
Zinc	

Organics

Acetone	Acrylonitrile
Benzene	Bromochloromethane
Bromdichloromethane	Bromoform
Carbon Disulfide	Carbon tetrachloride
Chlorobenzene	Chloroethane
Chloroform	Dibromochloromethane
1,2-Dibromoethane	1,2-Dichlorobenzene
1,4-Dichlorobenzene	trans-1,4-Dichloro-2-butene
1,1-Dichloroethane	1,2-Dichloroethane
1,1-Dichloroethylene	cis-1,2-Dichloroethylene
trans-1,2-Dichloroethylene	1,2-Dichloropropane
cis-1,3-Dichloropropene	trans-1,3-Dichloropropene
Ethylbenzene	Methyl butyl ketone
Methyl bromide	Methyl chloride

Methylene bromide
Methyl ethyl ketone
Methyl isobutyl ketone
1,1,1,2-Tetrachloroethane
Tetrachloroethylene
1,1,1-Trichloethane
Trichlorofluoromethane
Vinyl acetate
Xylenes

Methylene chloride
Methyl iodide
Styrene
1,1,2,2-Tetrachloroethane
Toluene
1,1,2-Trichloethane
1,2,3-Trichloropropane
Vinyl chloride



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 615-595-0025

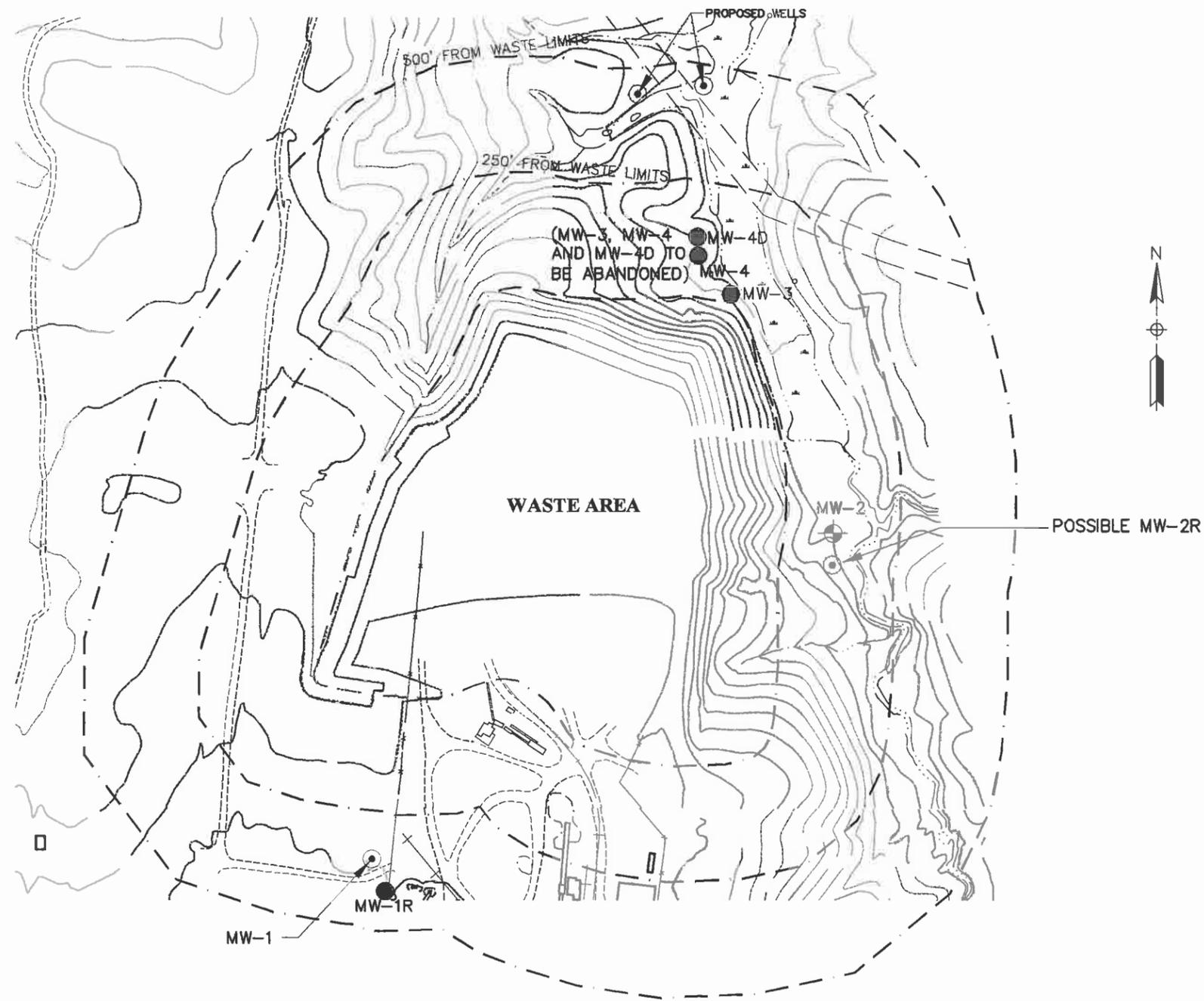
SITE LOCATION MAP
ATLANTIC SCRAP AND PROCESSING, LLC
KERNERSVILLE, NORTH, CAROLINA

USGS MAP(S)
 KERNERSVILLE, NORTH CAROLINA
 BELEW, NORTH CAROLINA

LAT 36° 08' 18" N
 LONG. 80° 06' 08" W
 Scale: 1"=2000'



W Z B



LEGEND

- PROPOSED WELL LOCATION
- ⊕ EXISTING WELL TO REMAIN



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BAR IS ONE INCH ON ORIGINAL DRAWING
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

W.Z. BAUMGARTNER & ASSOCIATES, INC.
 ENVIRONMENTAL ENGINEERS AND CONSULTANTS
 310 WILLIAMSON SQUARE (37064)
 P. O. BOX 680369
 FRANKLIN, TENNESSEE 37068-0369
 615-595-0025

DRAWN BY: CLG
 CHECKED BY: MET
 ENGINEER: WZB
 DATE: 10/28/2011

PROPOSED GROUNDWATER WELL NETWORK
 OMNISOURCE SOUTHEAST
 KERNERSVILLE, NORTH CAROLINA

SCALE: 1"=300'	PROJECT NO: 89109
CONTOUR INTERVAL: 2'	EXHIBIT NO: 1

NO.	REVISIONS	DATE	ENGR