NEW YORK STATE | Department of Environmental Conservation

NYSASWM Landfill Operator Certification

Water Quality Monitoring

March 19, 2024

Francesca King, P.G. - NYSDEC

Objective of Monitoring Program

‘The objective of your site monitoring program should be to obtain samples of water that are consistently representative of actual groundwater.’

Achievement?

1. Procedures
2. Documentation
3. Best Practices
4. Communication

1. Procedures

EMP and SAP

- Environmental Monitoring Plan (EMP) – describes site conditions, monitoring and reporting frequency, what samples are collected (*Part 363-4.6(f))*

- Site Analytical Plan (SAP)– specifies sample collection procedures and laboratory requirements (*Part 363-4.6(g))*

1.1 EMP Components

Water Quality Monitoring Programs

- **Existing water quality database:** preoperational, expansions, permit renewals
- **Operational water quality program:** to be conducted during operation, closure, and post-closure.
- **Contingency water quality program:** to be conducted when a significant increase over the existing water quality trigger value.

Existing Water Quality Program

- -Must establish an existing water quality database to characterize site geochemistry
- -Preliminary evaluation
- -Trigger value development (1 round expanded, 3 round baseline+) at all environmental monitoring points
- Non-detects

Statistical Requirements for Trigger Values

- For each data set, mean, standard deviation and coefficient of variation must be calculated.
  - Type A Trigger Value:
    - Coefficient of variation <0.5 or less than 15% non-detects
    - Trigger value is mean value plus 3 standard deviations
  - Type B Trigger Value:
    - Coefficient of variation >0.5 or more than 15% non-detects
    - Trigger values the 90th percentile of the data set

Subpart 360.4(o)(5) Transition Regulations

‘Existing landfills which have prior department approval of the existing water quality database described in subpart 363-7.4(c)(1) of this Title may continue to utilize those established statistical trigger values for compliance purposes.’

Permit renewal/modification or Expansions

- Updated Facility Manual requires updated EMP & SAP
  - Establish trigger values for all expanded parameters
  - 1st round should be done during the next quarterly sampling event after permit renewal.
- Expansions into areas without EWQ database:
  - New wells require sampling for full expanded parameter list
  - Four rounds need to be completed (expanded, 3x baseline+)

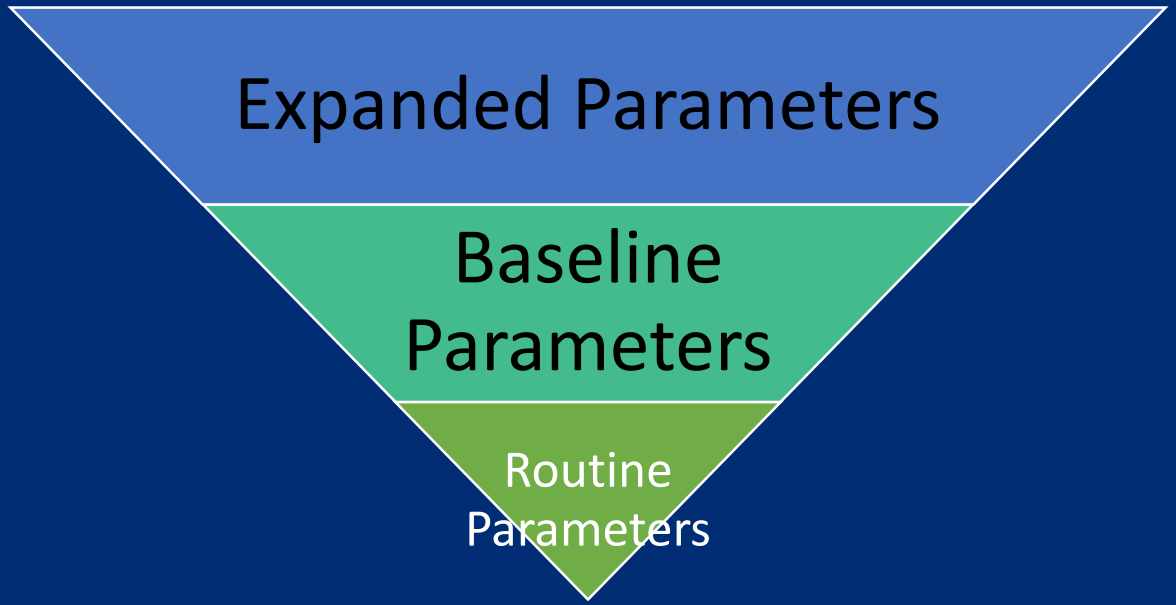
Operational Water Quality Program

- Goal is to distinguish facility derived contamination from existing water quality using trigger values.
- Quarterly – 1x baseline & 3 routine parameters
  - Conditions for semiannual baseline sampling
  - Omit winter round
- 90 days to compare to trigger values and 14 days to notify department
  - Contingency plan

Contingency Water Quality Program

- Conducted when there is a significant increase over the existing water quality value.
- 90 days to monitor for expanded parameters
- Receive results and 14 days to review
- 90 days to resample all wells and annually expanded
- Continue monitoring or corrective measures

Water Quality Analysis Tables



Routine Parameters

TABLE 1: ROUTINE PARAMETERS [1]

Common Name (and CAS number, as appropriate) [2]		
Field Parameters:	Leachate Indicators:	Inorganic Parameters (total):
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Arsenic
Specific Conductance	Ammonia (7664-41-7)	Cadmium
Temperature	Nitrate	Calcium
Floaters or Sinkers [3]	Chemical Oxygen Demand	Iron
Temperature	Biochemical Oxygen Demand (BOD_5)	Lead
pH	Total Organic Carbon	Magnesium
Eh	Total Dissolved Solids	Manganese
Dissolved Oxygen [4]	Sulfate	Potassium
Field Observations [5]	Alkalinity	Sodium
Turbidity	Phenols (108-95-2)	
	Chloride	
	Bromide (24959-67-9)	
	Total hardness as $CaCO_3$	

Baseline Parameters

TABLE 2A: BASELINE PARAMETERS: Field Parameters, Leachate Indicators, and Inorganic Parameters [6]

Common Name (and CAS number, as appropriate) [7]		
Field Parameters:	Leachate Indicators:	Inorganic Parameters (total unless otherwise noted):
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Aluminum
Specific Conductance	Ammonia (7664-41-7)	Antimony
Temperature	Nitrate	Arsenic
Floaters or Sinkers [8]	Chemical Oxygen Demand	Barium
Temperature	Biochemical Oxygen Demand (BOD_5)	Beryllium
pH	Total Organic Carbon	Cadmium
Eh	Total Dissolved Solids	Calcium
Dissolved Oxygen [9]	Sulfate	Chromium
Field Observations [10]	Alkalinity	Chromium (Hexavalent) [11]
Turbidity	Phenols (108-95-2)	Cobalt
	Chloride	Copper
	Bromide (24959-67-9)	Cyanide
	Total hardness as $CaCO_3$	Iron
	Color	Lead
	Boron (7440-42-8)	Magnesium
		Manganese
		Mercury
		Nickel
		Potassium
		Selenium
		Silver
		Sodium
		Thallium
		Vanadium
		Zinc

TABLE 2B: BASELINE PARAMETERS: Organic Parameters [12]

Baseline Parameters continued…

TABLE 2B: BASELINE PARAMETERS: Organic Parameters [12]

Common Name (and CAS number, as appropriate) [13]		
Organic Parameters:		
Acetone (67-64-1)	1,1-Dichloroethane; Ethylidene chloride (75-34-3)	Styrene (100-42-5)
Acrylonitrile (107-13-1)	1,2-Dichloroethane; Ethylene dichloride (107-06-02)	1,1,1,2-Tetrachloroethane (630-20-6)
Benzene (71-43-2)	1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride (75-35-4)	1,1,2,2-Tetrachloroethane (79-34-5)
Bromochloromethane (74-97-5)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene (156-59-2)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene (127-18-4)
Bromodichloromethane (75-27-4)	trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene (156-60-2)	Toluene (108-88-3)
Bromoform; Tribromomethane (75-25-2)	1,2-Dichloropropane; Propylene dichloride (78-87-5)	1,1,1-Trichloroethane; Methylchloroform (71-55-6)
Carbon disulfide (75-15-0)	cis-1,3-Dichloropropene (10061-01-5)	1,1,2-Trichloroethane (79-00-5)
Carbon tetrachloride (56-23-5)	trans-1,3-Dichloropropene (10061-02-6)	Trichloroethylene; Trichloroethene (79-01-6)
Chlorobenzene (108-90-7)	Ethylbenzene (100-41-4)	Trichlorofluoromethane; CFC-11 (75-69-4)
Chloroethane; Ethyl chloride (75-00-3)	2-Hexanone; Methyl butyl ketone (591-78-6)	1,2,3-Trichloropropane (96-18-4)
Chloroform; Trichloromethane (67-66-3)	Methyl bromide; Bromomethane (74-83-9)	Vinyl acetate (108-05-4)
Dibromochloromethane; Chlorodibromomethane (124-48-1)	Methyl chloride; Chloromethane (74-87-3)	Vinyl chloride; Chloroethene (75-01-4)
1,2-Dibromo-3-chloropropane; DBCP (96-12-8)	Methylene bromide; Dibro- momethane (74-95-3)	Xylenes (1330-20-7)
1,2-Dibromoethane; Ethylene dibromide; EDB (106-93-4)	Methylene chloride; Dichloromethane (75-09-2)	
o-Dichlorobenzene; 1,2-Dichlorobenzene (95-50-1)	Methyl ethyl ketone; MEK; 2-Butanone (78-93-3)	
p-Dichlorobenzene; 1,4-Dichlorobenzene (106-46-7)	Methyl Iodide; Iodomethane (74-88-4)	
trans-1,4-Dichloro-2-butene (110-57-6)	4-Methyl-2-pentanone; Methyl isobutyl ketone (108-10-1)	

Expanded Parameters

TABLE 3A: EXPANDED PARAMETERS: Field Parameters, Leachate Indicators, Radionuclides, and Inorganic Parameters [14]

Common Name (and CAS number, as appropriate) [15]			
Field Parameters:	Leachate Indicators:	Inorganic Parameters: (total unless otherwise noted):	Radionuclides [16]
Static water level (in wells and sumps)	Total Kjeldahl Nitrogen	Aluminum	Radium-226 per EPA 903.1
Specific Conductance	Ammonia (7664-41-7)	Antimony	Radium-228 per EPA 904.0
Temperature	Nitrate	Arsenic	Total Uranium per EPA 908.0
Floaters or Sinkers [17]	Chemical Oxygen Demand	Barium	
Temperature	Biochemical Oxygen Demand (BOD_5)	Beryllium	
pH	Total Organic Carbon	Cadmium	
Eh	Total Dissolved Solids	Calcium	
Dissolved Oxygen [18]	Sulfate	Chromium	
Field Observations [19]	Alkalinity	Chromium (Hexavalent) [20]	
Turbidity	Phenols (108-95-2)	Cobalt	
	Chloride	Copper	
	Bromide (24959-67-9)	Cyanide	
	Total hardness as $CaCO_3$	Iron	
	Color	Lead	
	Boron (7440-42-8)	Magnesium	
		Manganese	
		Mercury	
		Nickel	
		Potassium	
		Selenium	
		Silver	
		Sodium	
		Thallium	
		Tin	
		Vanadium	
		Zinc	

Expanded Parameters…much longer list

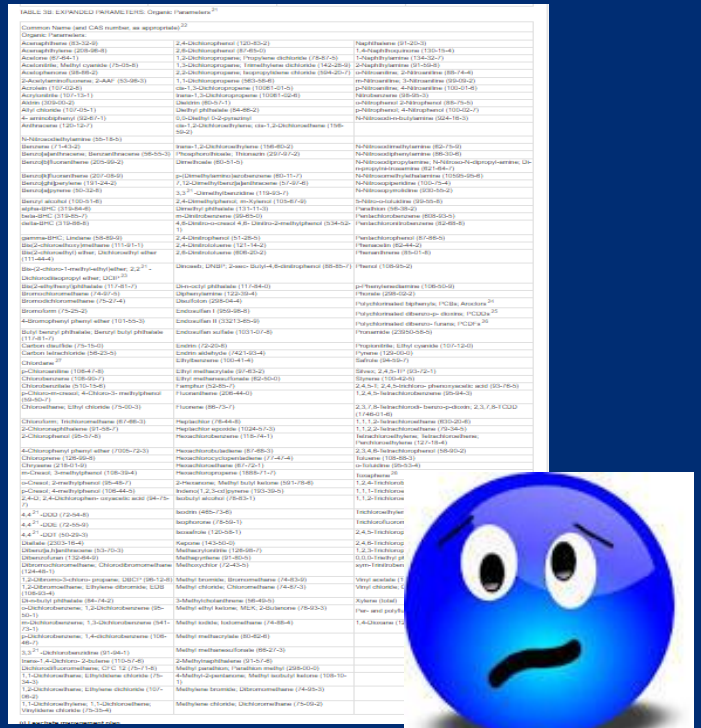
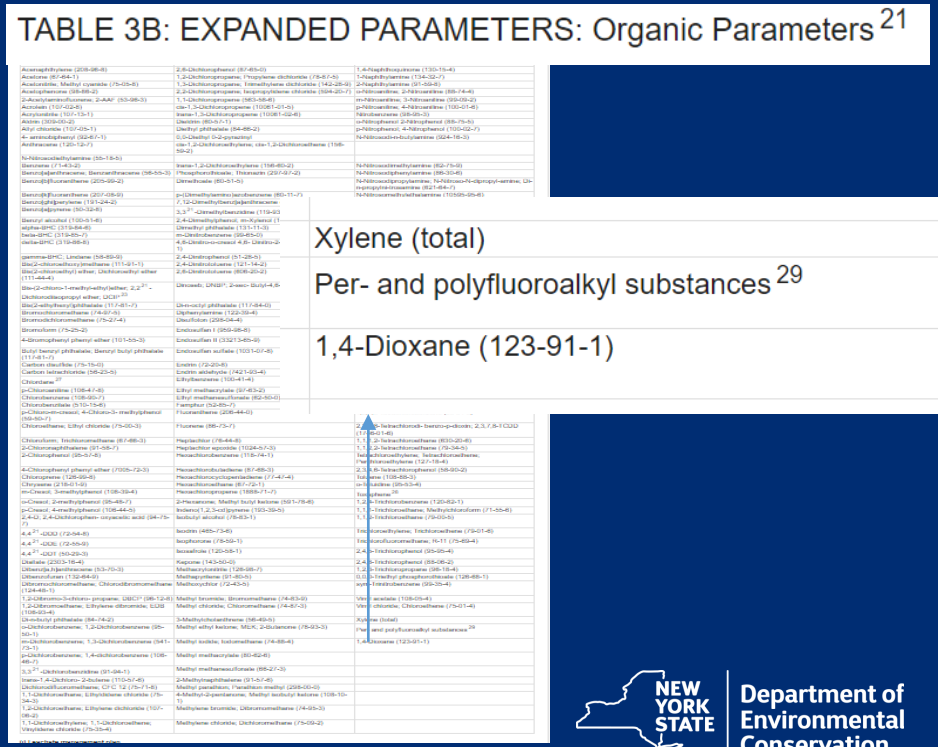


TABLE 3B: EXPANDED PARAMETERS: Organic Parameters[21]

Common Name (and CAS number, as appropriate)[22] Organic Parameters		
Acenaphthene (83-32-9)	2,4-Dichlorophenol (120-83-2)	Naphthalene (91-20-3)
Acenaphthylene (208-96-8)	2,6-Dichlorophenol (87-65-0)	1,4-Naphthoquinone (130-15-4)
Acetone (67-64-1)	1,2-Dichloropropane; Propylene dichloride (78-87-5)	1-Naphthylamine (134-32-7)
Acetonitrile; Methyl cyanide (75-05-8)	1,3-Dichloropropene; Telmethylene dichloride (142-28-9)	2-Naphthylamine (91-59-8)
Acetophenone (98-86-2)	2,2-Dichloropropane; Isopropylidene chloride (594-20-7)	o-Nitroaniline; 2-Nitroaniline (88-74-4)
2-Acetylaminofluorene; 2-AAF (53-96-3)	1,1-Dichloropropene (563-58-6)	m-Nitroaniline; 3-Nitroaniline (99-09-2)
Acrolein (107-02-8)	cis-1,3-Dichloropropene (10061-01-5)	p-Nitroaniline; 4-Nitroaniline (100-01-6)
Acrylonitrile (107-13-1)	trans-1,3-Dichloropropene (10061-02-6)	Nitrobenzene (98-95-3)
Aldrin (309-00-2)	Dieldrin (60-57-1)	o-Nitrophenol; 2-Nitrophenol (88-75-5)
Allyl chloride (107-05-1)	Diethyl phthalate (84-66-2)	p-Nitrophenol; 4-Nitrophenol (100-02-7)
4- aminobiphenyl (92-67-1)	0,0-Diethyl O-2-pyrazinyl phosphorothioate; Thionazin (297-97-2)	N-Nitrosodi-n-butylamine (924-16-3)
Anthracene (120-12-7)	cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene (156-59-2)	N-Nitrosodiethylamine (55-18-5)
	trans-1,2-Dichloroethylene (156-60-2)	N-Nitrosodimethylamine (62-75-9)
Benzene (71-43-2)	1,2-Dichlorobenzene; 1,2-Dichlorobenzene (95-50-1)	N-Nitrosodiphenylamine (86-30-6)
Benzo[a]anthracene; Benzanthracene (56-55-3)	Dichlorvos; DDVP; Phosphoric acid, 2,2-dichloroethenyl dimethyl ester (62-73-7)	N-Nitrosodipropylamine; N-Nitroso-N-dipropyl-amine; Di-n-propyl-ni-trosamine (621-64-7)
Benzo[b]fluoranthene (205-99-2)	Dimethoate (60-51-5)	N-Nitrosomethylethylamine (10595-95-6)
Benzo[ghi]perylene (191-24-2)	p-Dimethylaminoazobenzene (60-11-7)	N-Nitrosopiperidine (100-75-4)
Benzo[a]pyrene (50-32-8)	7,12-Dimethylbenz[a]anthracene (57-97-6)	N-Nitrosopyrrolidine (930-55-2)
Benzyl alcohol (100-51-6)	3,3'-Dimethylbenzidine (119-93-7)	5-Nitro-o-toluidine (99-55-8)
alpha-BHC (319-84-6)	2,4-Dimethylphenol, m-Xylenol (105-67-9)	Parathion (56-38-2)
beta-BHC (319-85-7)	Dimethyl phthalate (131-11-3)	Pentachlorobenzene (608-93-5)
delta-BHC (319-86-8)	m-Dinitrobenzene (99-65-0)	Pentachloronitrobenzene (82-68-8)
	4,6-Dinitro-o-cresol 4,6- Dinitro-2-methylphenol (534-52-1)	Pentachlorophenol (87-86-5)
gamma-BHC; Lindane (58-89-9)	2,4-Dinitrophenol (51-28-5)	Phenacetin (62-44-2)
Bis(2-chloroethoxy)methane (111-91-1)	2,4-Dinitrotoluene (121-14-2)	Phenanthrene (85-01-8)
Bis(2-chloroethyl) ether, Dichloroethyl ether (111-44-4)	2,6-Dinitrotoluene (606-20-2)	Phenol (108-95-2)
Bis-(2-chloro-1-methylethyl)ether; 2,2'-Dichloroisopropyl ether; DCIP[23]	Dinoseb; DNBP; 2-sec- Butyl-4,6-dinitrophenol (88-85-7)	p-Phenylenediamine (106-50-3)
Bis(2-ethylhexyl)phthalate (117-81-7)	Di-n-octyl phthalate (117-84-0)	Phorate (298-02-2)
Bromochloromethane (74-97-5)	Diphenylamine (122-39-4)	Pronamide (23950-58-5)
Bromodichloromethane (75-27-4)	Disulfoton (298-04-4)	Pyrene (129-00-0)
Bromoform (75-25-2)	Endosulfan I (959-98-8)	Safrole (94-59-7)
4-Bromophenyl phenyl ether (101-55-3)	Endosulfan II (33213-65-9)	Silvex, 2,4,5-TP (93-72-1)
Butyl benzyl phthalate; Benzyl butyl phthalate (111-68-1)	Endosulfan sulfate (1031-07-8)	Simazine (122-34-9)
Carbon disulfide (75-15-0)	Endrin (72-20-8)	2,4,5-T; 2,4,5-trichloro- phenoxyacetic acid (93-76-5)
Carbon tetrachloride (56-23-5)	Endrin aldehyde (7421-93-4)	1,2,4,5-Tetrachlorobenzene (95-94-3)
Chlordane[24]	Ethylbenzene (100-41-4)	2,3,7,8-Tetrachlorodi- benzo-p-dioxin; 2,3,7,8-TCDD (1746-01-6)
p-Chloroaniline (106-47-8)	Ethyl methacrylate (97-63-2)	1,1,1,2-Tetrachloroethane (630-20-6)
Chlorobenzene (108-90-7)	Ethyl methanesulfonate (62-50-0)	1,1,2,2-Tetrachloroethane (79-34-5)
Chlorobenzilate (510-15-6)	Famphur (52-85-7)	Tetrachloroethylene; Tetrachloroethene; Perchloroethylene (127-18-4)
p-Chloro-m-cresol; 4-Chloro-3- methylphenol (59-50-7)	Fluoranthene (206-44-0)	2,3,4,6-Tetrachlorophenol (58-90-2)
Chloroethane; Ethyl chloride (75-00-3)	Fluorene (86-73-7)	Toluene (108-88-3)
Chloroform; Trichloromethane (67-66-3)	Heptachlor (76-44-8)	o-Toluidine (95-53-4)
2-Chloronaphthalene (91-58-7)	Heptachlor epoxide (1024-57-3)	Toxaphene[25]
2-Chlorophenol (95-57-8)	Hexachlorobenzene (118-74-1)	1,2,4-Trichlorob
4-Chlorophenyl phenyl ether (7005-72-3)	Hexachlorobutadiene (87-68-3)	1,1,1-Trichloroe
Chloroprene (126-99-8)	Hexachlorocyclopentadiene (77-47-4)	1,1,2-Trichloroe
Chrysene (218-01-9)	Hexachloroethane (67-72-1)	Trichloroethyle
m-Cresol; 3-methylphenol (108-39-4)	Hexachlorophene (70899-71-7)	Trichlorofluorom
o-Cresol; 2-methylphenol (95-48-7)	2-Hexanone; Methyl butyl ketone (591-78-6)	2,4,5-Trichloro
p-Cresol; 4-methylphenol (106-44-5)	Indeno(1,2,3-cd)pyrene (193-39-5)	2,4,6-Trichloro
2,4-D; 2,4-Dichlorophen- oxyacetic acid (94-75-7)	Isobutyl alcohol (78-83-1)	Vinyl acetate (1
4,4'-DDD (72-54-8)	Isodrin (465-73-6)	Vinyl chloride (
4,4'-DDE (72-55-9)	Isophorone (78-59-1)	
4,4'-DDT (50-29-3)	Isosafrole (120-58-1)	
Diallate (2303-16-4)	Kepone (143-50-0)	
Dibenz[a,h]anthracene (53-70-3)	Methacrylonitrile (126-98-7)	
Dibenzofuran (132-64-9)	Methapyrilene (91-80-5)	
Dibromochloromethane; Chlorodibromomethane (124-48-1)	Methoxychlor (72-43-5)	
1,2-Dibromo-3-chloro- propane; DBCP (96-12-8)	Methyl bromide; Bromomethane (74-83-9)	
1,2-Dibromoethane; Ethylene dibromide; EDB (106-93-4)	Methyl chloride; Chloromethane (74-87-3)	
Di-n-butyl phthalate (84-74-2)	3-Methylcholanthrene (56-49-5)	
o-Dichlorobenzene; 1,2-Dichlorobenzene (95-50-1)	Methyl ethyl ketone; MEK; 2-Butanone (78-93-3)	
m-Dichlorobenzene; 1,3-Dichlorobenzene (541-73-1)	Methyl iodide; Iodomethane (74-88-4)	
p-Dichlorobenzene; 1,4-dichlorobenzene (106-46-7)	Methyl methacrylate (80-62-6)	
3,3'-Dichlorobenzidine (91-94-1)	Methyl methanesulfonate (66-27-3)	
trans-1,4-Dichloro- 2-butene (110-57-6)	2-Methylnaphthalene (91-57-6)	
Dichlorodifluoromethane; CFC 12 (75-71-8)	Methyl parathion; Parathion methyl (298-00-0)	
1,1-Dichloroethane; Ethylidene chloride (75-34-3)	4-Methyl-2-pentanone; Methyl isobutyl ketone (108-10-1)	
1,2-Dichloroethane; Ethylene dichloride (107-06-2)	Methylene bromide; Dibromomethane (74-95-3)	
1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride (75-35-4)	Methylene chloride; Dichloromethane (75-09-2)	

Emerging Contaminants

- PFAS – Forever Chemicals
- 1,4-Dioxane
- + Radionuclides
  - Two sets of samples required



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Surface Water Sampling

- All surface water bodies that may be significantly affected by a contaminant release from the facility should be included.
  - Streams, standing water bodies and groundwater seeps.
  - Iron flocs
  - Sediment sampling

Leachate Sampling

- Primary leachate = expanded parameters
- Secondary leachate = baseline parameters
  - Semiannual or annual sampling
  - Special requirements in an ALR exceedance event

Condensate Sampling

- Semiannual expanded parameter
- Modified schedule with DEC approval

1.2 SAP Components

Field Sampling Procedures

- Detailed SOP should be outlined
  - Purging requirements
  - Sample collection methods
  - Special considerations
  - Storage
  - Preservation
  - Transportation

WHY? - Consistency

PFAS Field Sampling Procedures

- Are sampling personnel doing everything correctly?
  - Personal care products, no fabric softener, washed clothes.
  - No insect repellents or sunscreen.
  - No lunch in the cooler or eating around samples.
  - Special sampling equipment.
  - No latex gloves – powderless nitrile cloves.
  - Clipboard, recycled paper products.

Laboratory Procedures

- Laboratory should have certified ELAP certification
- Detailed SOP including the following:
  - Receipt, storage and handling of samples
  - Holding time requirements
  - Reagents
  - Equipment calibration
  - Analysis methods – defined by regulations

Data Validation & Data Usability Analysis

- What is data validation?
- Who can do it?

- Data usability – do the results make sense?
  - Look at field duplicates, trip blanks, equipment blank, field blanks, MS/MSD.

2. Documentation

Types of Documentation

- Well drilling and installation details
- Field sampling data sheet
- Chain of custody sheet
- Reports

Contractor:
Driller:
Oversight:
Rig Type: CME - 850 Track

DRILLING RECORD

PROJECT NAME: NYSDEC Inactive Landfill Initiative Region 1
PROJECT Location: Denver Averne

BORING/ WELL NO. MW-01 Page 1 of 1
Location Description:
Upgradient

GROUNDWATER OBSERVATIONS

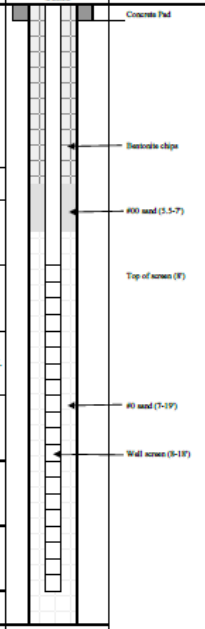
Apparent Borehole DTW:		11.00	ft bls
Measured Water Level:		8.18	ft bls
Total Depth of Well:		19.00	ft bls
Additional Comments:			

Date/Time Start: 1/2/2018 / 1530
Date/Time Finish: 1/3/2018 / 1015
Weather: Partly cloudy, 20 degrees F

Locatio Plan

Sample Type	SPT	Recovery (%)	PID (PPM)	USCS Symbol	Depth (ft bls)	FIELD IDENTIFICATION OF MATERIAL
			0.0		1	
HC		100	0.0		2	
			0.0		3	Moist, loose, dark reddish-brown, fine SAND and Silt, fine to medium angular gravel, trace metal slag, plastic, ceramic, and sheet metal.
			0.0		4	
			0.0		5	
SS	6-8-4-WH	20	0.0	SW	6	Moist, loose, light brown-gray, fine to medium SAND, little medium to coarse subrounded gravel.
					7	Moist, loose, light brown-gray, fine to medium SAND, little medium to coarse subrounded gravel.
SS	18-5-5-6	20	0.0	SW	8	
					9	8-9': Moist, loose, light brown-gray, fine to medium SAND, little medium to coarse subrounded gravel.
SS	1-2-3-5	30	0.0	SW	10	9-10': Moist, loose, light brown-gray, fine to coarse SAND, some medium to coarse subrounded gravel.
					11	Wet, loose to medium dense, light orange/brown, fine to medium SAND, little silt.
SS	4-5-13-15	50	0.0	SM	12	
					13	Wet, loose, light orange/brown, fine to medium SAND, little silt.
SS	18-17-5-12	60	0.0	SM	14	
					15	Wet, loose, light orange/brown, fine to medium SAND, little silt.
SS	15-23-9-5	80	0.0	SM	16	
					17	Wet, loose, light orange/brown, fine to medium SAND, little silt.
SS	5-8-WH-WH	100	0.0	SM	18	
					19	
						End of Boring at 19' bgs.

SCHEMATIC Drawing Not to Scale



COMMENTS

SAMPLING METHOD
HC = Hand Cleared (post hole) to 5 feet
SS= Split Spoon

COMMENTS:
Set screen from 8 to 18 feet. #0 sand and #00 sand filtration media. Grout is mixture of Portland I/II cement and granular bentonite slurry.
Stick up protective casing set in concrete pad.

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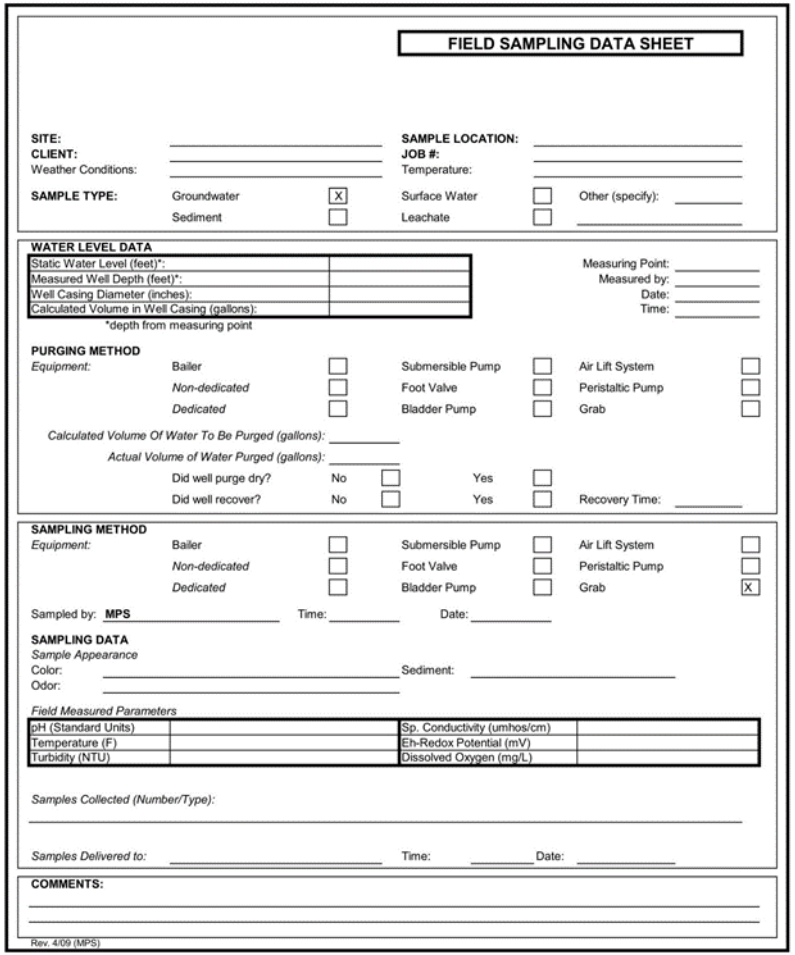

FIELD SAMPLING DATA SHEET

SITE: _____ **SAMPLE LOCATION:** _____
CLIENT: _____ **JOB #:** _____
Weather Conditions: _____ Temperature: _____

SAMPLE TYPE: Groundwater [X] Surface Water [ ] Other (specify): _____
Sediment [ ] Leachate [ ] _____

WATER LEVEL DATA

Static Water Level (feet)*:	
Measured Well Depth (feet)*:	
Well Casing Diameter (inches):	
Calculated Volume in Well Casing (gallons):	

*depth from measuring point

Measuring Point: _____
Measured by: _____
Date: _____
Time: _____

PURGING METHOD

Equipment: Bailer [ ] Submersible Pump [ ] Air Lift System [ ]
Non-dedicated [ ] Foot Valve [ ] Peristaltic Pump [ ]
Dedicated [ ] Bladder Pump [ ] Grab [ ]

Calculated Volume Of Water To Be Purged (gallons): _____
Actual Volume of Water Purged (gallons): _____

Did well purge dry? No [ ] Yes [ ]
Did well recover? No [ ] Yes [ ] Recovery Time: _____

SAMPLING METHOD

Equipment: Bailer [ ] Submersible Pump [ ] Air Lift System [ ]
Non-dedicated [ ] Foot Valve [ ] Peristaltic Pump [ ]
Dedicated [ ] Bladder Pump [ ] Grab [X]

Sampled by: MPS Time: _____ Date: _____

SAMPLING DATA

Sample Appearance
Color: _____ Sediment: _____
Odor: _____

Field Measured Parameters

pH (Standard Units)		Sp. Conductivity (umhos/cm)	
Temperature (F)		Eh-Redox Potential (mV)	
Turbidity (NTU)		Dissolved Oxygen (mg/L)	

Samples Collected (Number/Type): _____

Samples Delivered to: _____ Time: _____ Date: _____

COMMENTS:

Rev. 4/09 (MPS)

NEW YORK STATE Department of Environmental Conservation

Pace Analytical®
Phone: 612-607-6400
Fax: 612-607-6344
https://www.pacelabs.com/
1800 Elm Street SE
Minneapolis, MN 55414

Doc # 380 Rev 1_03242017

CHAIN OF CUSTODY RECORD (New York)

Page _____ of _____

Contact: https://www.pacelabs.com/contact-us/contact-environmental-sciences/

Company Name:
Address:
Phone:
Project Name:
Project Location:
Project Number:
Project Manager:
Pace Analytical Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
7-Day ☐ 10-Day ☐
Due Date:

Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

Data Delivery
Format: PDF ☐ EXCEL ☐
Other:
CLP Like Data Pkg Required: ☐
Email To:
Fax To #:

ANALYSIS REQUESTED

Pace Analytical Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	[1]Matrix Code	Conc Code	# of Containers	[2] Preservation Code	[3] Container Code

Dissolved Metals Samples
☐ Field Filtered
☐ Lab to Filter

Orthophosphate Samples
☐ Field Filtered
☐ Lab to Filter

Comments:

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:

Program & Regulatory Information
☐ AWQ STDS ☐ NY TOGS
☐ NYC Sewer Discharge ☐ NY CP-51
☐ Part 360 GW (Landfill)
☐ NY Restricted Use
☐ NY Unrestricted Use
☐ NY Part 375
Other:

Deliverables
☐ Enhanced Data Package
☐ NYSDEC EQuIS EDD
☐ EQuIS (Standard) EDD
☐ NY Regulatory EDD
☐ NY Regs Hits-Only EDD
Other:
NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School
☐ City ☐ Brownfield ☐ MBTA

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet

Department of Environmental Conservation

Quarterly Reporting Requirements

- Reports due to DEC within 90 days of sampling
- Summary table with sampling information
- Tables or graphs with comparison to trigger values, state standards, and upgradient values
- Summary of any notable exceedances and next steps

Annual Reporting Requirements

- Summary report and changes throughout the year
- Significant events – petroleum spills around wells
- An updated historical water quality monitoring table for each parameter that has been detected at least once at one or more monitoring points.

3. Best Practices

Sampling

- Order of Sampling
  - Upgradient to Down Gradient
  - Least to Most Contaminated

Preferred Sampling Collection

- Samples should be collected and containerized in the order of the volatilization sensitivity of the parameters. The general preferred order of collection is as follows:
  - Purgeable volatile organics
  - Total organic carbon (TOC)
  - Extractable organics
  - Total metals
  - Dissolved metals
  - Phenols
  - Cyanide
  - Sulfate and chloride
  - Turbidity
  - Nitrate and ammonia
  - Any other parameters

Monitoring Well Maintenance

- Easily accessible
- Cleared of brush & debris
- Label visible
- Locked & secured

NEW YORK STATE
Department of Environmental Conservation

Monitoring Wells – Visibility is Key

- Snow!!!!
- Visible placards

4. Communication

DEC Point of View

- Q2 sampling : Apr-June VOC hit
- Q2 report : end of Sept submittal
- Q3 sampling : July-Sept VOC not sampled
- Q3 report : end of Dec submittal
- Q4 sampling : Oct-Dec VOC not sampled
- 6-8 months of no data due to lack of communication

Communication is important

- Separate entities working together
  1. Landfill operator
  2. Consultant
  3. Sampling crew
  4. Laboratory
  5. Regulators

Summary

- Communicate with your regulators
- Know your SAP & EMP
- Document EVERYTHING
- Maintain your wells and surrounding areas
- Be active about the new regs and what is expected of your landfill

Thank You

- Francesca King, P.G.
- Professional Geologist 1
- Region 1 Stony Brook Office
- francesca.king@dec.ny.gov
- 631-444-0379

Connect with us:
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