Harbor

Environmental | Safety | Engineering

July 2, 2020

Ms. Heather Hoggard
Pretreatment Inspector
Springfield Clean Water Services
755 N. Franklin Avenue
Springfield, MO 65802

Re: Semi-Annual Leachate Report
First Half 2020
NABORS Landfill
Mountain Home, Arkansas
Wastewater Contribution Permit No. 593

Dear Ms. Hoggard:

On behalf of the Arkansas Department of Environmental Quality (ADEQ), please find attached the results of leachate analysis for the First Half 2020 reporting period for the referenced facility. A total of 606,000 gallons of leachate was generated during the reporting period.

The leachate generated at the NABORS Landfill is transported to the City of Springfield, MO wastewater collection system under Wastewater Contribution Permit #593. A sample of the leachate plus a duplicate sample was collected and submitted for laboratory analysis. Table 1 below summarizes the analytical methods and results of the analyses.

Table 1 – Summary of Leachate Analytical Results – April 2019

Parameter	Analytical Method	Units	Leachate	Leachate Duplicate
Inorganics				
pH	EPA 150.2 (1982)	S.U.	**7.45**	—
Chloride	EPA 300.0, 2.1-1993	mg/L	**463**	**461**
Sulfate as SO_4	EPA 300.0, 2.1-1993	mg/L	**3.02**	**3.10**
Ammonia as N	SM 4500-NH3 B,D,C-2011	mg/L	**128**	**121**
Cyanide (total)	SM 4500-CN B,E-2011	mg/L	<0.010	<0.010
Flashpoint	SW 1010A, Rev 1, 2004	°C	Did Not Flash	Did Not Flash
Oil and Grease	EPA 1664 Mod, Rev. B 2010	mg/L	<5.18	<5.18
Sulfide	SM 4500-S2 D-2011	mg/L	<0.150	<0.150
TDS	SM 2540 C-2011	mg/L	**1,650**	**1,600**
Antimony	EPA 200.8 Rev 5.4 (1994)	µg/L	<2.08	<2.08
Arsenic	EPA 200.8 Rev 5.4 (1994)	µg/L	**18.7**	**18.3**
Barium	EPA 200.8 Rev 5.4 (1994)	µg/L	**1,420**	**1,400**

Parameter	Analytical Method	Units	Leachate	Leachate Duplicate
Beryllium	EPA 200.8 Rev 5.4 (1994)	µg/L	<0.260	<0.260
Cadmium	EPA 200.8 Rev 5.4 (1994)	µg/L	<0.260	<0.260
Chromium	EPA 200.8 Rev 5.4 (1994)	µg/L	**6.75**	**6.66**
Cobalt	EPA 200.8 Rev 5.4 (1994)	µg/L	**14.9**	**15.0**
Copper	EPA 200.8 Rev 5.4 (1994)	µg/L	**40.3**	**40.7**
Iron	EPA 200.8 Rev 5.4 (1994)	µg/L	**12,200**	**11,700**
Lead	EPA 200.8 Rev 5.4 (1994)	µg/L	**2.89**	**2.98**
Manganese	EPA 200.8 Rev 5.4 (1994)	µg/L	**847**	**844**
Mercury	SW7470A/EPA245.1,3.0 (1994)	µg/L	<0.200	<0.200
Nickel	EPA 200.8 Rev 5.4 (1994)	µg/L	**59.4**	**59.3**
Phosphorus	EPA 200.8 Rev 5.4 (1994)	mg/L	**0.382**	**0.381**
Selenium	EPA 200.8 Rev 5.4 (1994)	µg/L	<2.08	<2.08
Silver	EPA 200.8 Rev 5.4 (1994)	µg/L	<0.260	<0.260
Thallium	EPA 200.8 Rev 5.4 (1994)	µg/L	<0.260	<0.260
Tin	EPA 200.8 Rev 5.4 (1994)	µg/L	<20.8	<20.8
Vanadium	EPA 200.8 Rev 5.4 (1994)	µg/L	**5.19**	**4.99**
Zinc	EPA 200.8 Rev 5.4 (1994)	µg/L	**148**	**149**
Organics				
TOC	SM 5310 B-2011	mg/L	**108**	**108**
Acrolein	EPA 624	µg/L	<20.0	<20.0
Acrylonitrile	EPA 624	µg/L	<5.00	<5.00
Benzene	EPA 624	µg/L	**4.09 J**	**3.98 J**
Bromodichloromethane	EPA 624	µg/L	<5.00	<5.00
Bromoform	EPA 624	µg/L	<5.00	<5.00
Bromomethane	EPA 624	µg/L	<5.00	<5.00
Carbon tetrachloride	EPA 624	µg/L	<5.00	<5.00
Chlorobenzene	EPA 624	µg/L	**1.86 J**	**2.07 J**
Chloroethane	EPA 624	µg/L	<5.00	<5.00
2-Chloroethyl vinyl ether	EPA 624	µg/L	<5.00	<5.00
Chloroform	EPA 624	µg/L	<5.00	<5.00
Chloromethane	EPA 624	µg/L	<5.00	<5.00
Dibromochloromethane	EPA 624	µg/L	<5.00	<5.00
1,2-Dichlorobenzene	EPA 624	µg/L	<5.00	<5.00
1,3-Dichlorobenzene	EPA 624	µg/L	<5.00	<5.00
1,4-Dichlorobenzene	EPA 624	µg/L	**4.56 J**	**4.92 J**
1,1-Dichloroethane	EPA 624	µg/L	**0.853 J**	**0.969 J**
1,2-Dichloroethane	EPA 624	µg/L	<5.00	<5.00

Parameter	Analytical Method	Units	Leachate	Leachate Duplicate
1,1-Dichloroethene	EPA 624	µg/L	<5.00	<5.00
cis-1,2-Dichloroethene	EPA 624	µg/L	<5.00	<5.00
trans-1,2-Dichloroethene	EPA 624	µg/L	<5.00	<5.00
1,2-Dichloropropane	EPA 624	µg/L	<5.00	<5.00
cis-1,3-Dichloropropene	EPA 624	µg/L	<5.00	<5.00
trans-1,3-Dichloropropene	EPA 624	µg/L	<5.00	<5.00
Ethylbenzene	EPA 624	µg/L	**9.47**	**9.41**
Methylene chloride	EPA 624	µg/L	<15.00	<15.00
Tetrachloroethene	EPA 624	µg/L	<5.00	<5.00
1,1,2,2-Tetrachloroethane	EPA 624	µg/L	<5.00	<5.00
Toluene	EPA 624	µg/L	**1.15 J**	**1.11 J**
1,1,1-Trichloroethane	EPA 624	µg/L	<5.00	<5.00
1,1,2-Trichloroethane	EPA 624	µg/L	<5.00	<5.00
Trichloroethene	EPA 624	µg/L	<5.00	<5.00
Trichlorofluoromethane	EPA 624	µg/L	<5.00	<5.00

Notes: S.U. – standard units; °C – degrees Celsius; mg/L – milligrams per liter; µg/L – micrograms per liter

Also attached is the signed Certification Statement. Let me know if you have any questions or need additional information. Please contact either of the undersigned at 501-663-8800 or via email.

Sincerely,

Thomas A. Huetter, P.G.
Senior Project Manager
thuetter@harborenv.com

Leslie Davis
Principal
ldavis@harborenvcom

cc: Dr. Robert Blanz, P.E., PhD.
ADEQ Chief Technical Officer
5301 Northshore Drive
North Little Rock, AR 72118-5317

Attachments: *Laboratory Analytical Report*
Certification Statement

Discharge Monitoring Report Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

All samples and measurements taken are to the best of my knowledge representative of the permitted wastewater discharge.

All sampling, measurements, and analyses were conducted in accordance with guidelines prescribed in 40 CFR 136 and the Wastewater Contribution Permit obtained from the City of Springfield, Missouri.

Signature (**Legible**)

Associate Director, Office of Land Resources, DEQ

Title

Nabors Landfill

Name of Facility

28 July 2020

Date

Document ID 78662

Arkansas Analytical Inc.

8100 National Dr. - Little Rock, AR 72209
501-455-3233 Fax 501-455-6118

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205

Project: NABORS Landfill Leachate Sample(s)

Project Number: April 2020

SDG Number: 2004351

Enclosed are the results of analyses for samples received by the laboratory on 22-Apr-20 14:32. If you have any questions concerning this report, please feel free to contact me.

Sample Receipt Information:

Custody Seals	✔
Containers Correct	✔
COC/Labels Agree	✔
Received On Ice	✔
Temperature on Receipt	2.0°C

Sincerely,

Norma James / Teresa Coins

Norma James and/or Teresa Coins
Technical Director and/or QA Officer

Arkansas Analytical Inc.

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205
Project: NABORS Landfill Leachate Sample(s)

Project Number: April 2020
Date Received: 22-Apr-20 14:32

CASE NARRATIVE

Sample Delivery Group – 2004351

One *OR* more of the qualifiers described below may appear in this report. Qualifiers in RED apply to this SDG (Sample Delivery Group).

SAMPLE RECEIPT QUALIFIERS:

Qualifier	Description
ET	Samples received above required temperature.
ET	Samples received above required temperature
	Although collected and received the same day, no ice was present to indicate the cooling preservation was attempted.
E2	Result qualified as it was received and analyzed outside of holding time. Analysis is considered a "Field" analysis.
E2	Result qualified as it was received and/or analyzed outside of holding time.
E3	Result qualified as it was received in the incorrect container and/or preservation

ANALYTICAL QUALIFIERS:

Qualifier	Description
EDL	Result was non-detect at an elevated detection limit due to one or more of the following:
	Sample Matrix, Sample Dilution, or Limited Sample Volume
EX	Result exceeds DAILY MAXIMUM and/or MONTHLY AVERAGE.
EX2	The result exceeds the TCLP limit.
J	At client request J-Values are reported
	J-Values are considered "estimated" results as they are below the limit of quantitation yet above the method detection limit (MDL)
N	Insufficient Sample Weight as Required by Method
T40	The ambient temperature exceeded 23 +/- 2oC during the TCLP rotation process
TCLP-1	TCLP extraction done in alternate ZHE due to sample matrix.

FLASHPOINT QUALIFIER:

Qualifier	Description
DNF	Did Not Flash at or below method required temperature of 100 degrees C or 212 degrees F

CALIBRATION QUALIFIERS:

Qualifier	Description
CR	Result above highest calibration standard, but within linear calibration range.
Est3	Result at the instrument was above the concentration of the highest standard in the calibration curve.
E2-F	Second Source Verification Failure
E7	Internal Standard Response Failure
E11	Initial Calibration Minimum Response Factor Failure
E21	CCV Low
E-01	CCV High
E35	Low Level CCV Failure

QUALITY CONTROL QUALIFIERS:

Qualifier	Description
E20	Sample used as "parent" for the associated analytical batch
%D3/S-01	Surrogate failed to recover within acceptance criteria (%D3/S-01).
E1	Results associated with this surrogate were qualified as "estimated" (E1).
B	Present in the Associated Blank
B1	Present in Blank, but Not In the Sample
%D2 / E5	Laboratory Control Spike (LCS) and/or Laboratory Control Spike Duplicate (LCSD) failed to recover with acceptance criteria (%D2).
	Associated results were qualified as "estimated" (E5).
%D1	Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) failed acceptance criteria.
MBA	Failed criteria due to the high concentration of analyte in the parent sample.
MBI	Failed criteria due to an interference in the parent sample
%D3	Quality Control Surrogate failed acceptance criteria.
NREC	Quality Control Surrogate failed.

Arkansas Analytical Inc.

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205
Project: NABORS Landfill Leachate Sample(s)
Project Number: April 2020
Date Received: 22-Apr-20 14:32

ANALYTICAL RESULTS

Lab Number:	**2004351-01**
Sample Name:	**Leachate**
Date/Time Collected:	**4/20/20 10:20**
Sample Matrix:	**Leachate**

Anions	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Chloride	mg/L	**463**		4/23/20 15:03	B004378	EPA 300.0, 2.1-1993
Sulfate as SO4	mg/L	**3.02**		4/24/20 7:20	B004378	EPA 300.0, 2.1-1993

Total Metals	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Antimony	ug/L	< 2.08		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Arsenic	ug/L	**18.7**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Barium	ug/L	**1420**		4/23/20 15:07	B004368	EPA 200.8, Rev. 5.4(1994)
Beryllium	ug/L	< 0.260		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Cadmium	ug/L	< 0.260		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Chromium	ug/L	**6.75**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Cobalt	ug/L	**14.9**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Copper	ug/L	**40.3**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Iron	ug/L	**12200**		4/23/20 15:03	B004368	EPA 200.8, Rev. 5.4(1994)
Lead	ug/L	**2.89**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Manganese	ug/L	**847**		4/23/20 15:07	B004368	EPA 200.8, Rev. 5.4(1994)
Mercury	ug/L	< 0.200		4/28/20 16:16	B004428	SW7470A/EPA245.1,3.0- 1994
Nickel	ug/L	**59.4**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Phosphorus	mg/L	**0.382**		4/28/20 10:55	B004420	EPA 200.7, Rev 4.4 (1994)
Selenium	ug/L	< 2.08		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Silver	ug/L	< 0.260		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Thallium	ug/L	< 0.260		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Tin	ug/L	< 20.8		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Vanadium	ug/L	**5.19**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)
Zinc	ug/L	**148**		4/23/20 14:27	B004368	EPA 200.8, Rev. 5.4(1994)

Volatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
1,1-Dichloroethane	ug/L	**0.853**	J	4/23/20 11:31	B004371	EPA 624.1-2016
1,1-Dichloroethene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,1,1-Trichloroethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,1,2-Trichloroethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,1,2,2-Tetrachloroethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,2-Dichlorobenzene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,2-Dichloropropane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,2-Dichloroethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,3-Dichlorobenzene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
1,4-Dichlorobenzene	ug/L	**4.56**	J	4/23/20 11:31	B004371	EPA 624.1-2016
2-Chloroethyl Vinyl Ether	ug/L	< 5.00	E20, E21	4/23/20 11:31	B004371	EPA 624.1-2016
Acrylonitrile	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Benzene	ug/L	**4.09**	J	4/23/20 11:31	B004371	EPA 624.1-2016
Bromodichloromethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Bromoform	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Acrolein	ug/L	< 20.0		4/23/20 11:31	B004371	EPA 624.1-2016
Bromomethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016

Arkansas Analytical Inc.

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205

Project: NABORS Landfill Leachate Sample(s)

Project Number: April 2020
Date Received: 22-Apr-20 14:32

ANALYTICAL RESULTS

Lab Number:	**2004351-01**
Sample Name:	**Leachate**
Date/Time Collected:	**4/20/20 10:20**
Sample Matrix:	**Leachate**

Volatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Carbon tetrachloride	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Chlorobenzene	ug/L	**1.86**	J	4/23/20 11:31	B004371	EPA 624.1-2016
Dibromochloromethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Chloroethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Chloroform	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Chloromethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
cis-1,3-Dichloropropene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Ethylbenzene	ug/L	**9.47**		4/23/20 11:31	B004371	EPA 624.1-2016
Methylene chloride	ug/L	< 15.0		4/23/20 11:31	B004371	EPA 624.1-2016
Tetrachloroethene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Toluene	ug/L	**1.15**	J	4/23/20 11:31	B004371	EPA 624.1-2016
trans-1,2-Dichloroethene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Trichloroethene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
trans-1,3-Dichloropropene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Vinyl chloride	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
Trichlorofluoromethane	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
cis-1,2-Dichloroethene	ug/L	< 5.00		4/23/20 11:31	B004371	EPA 624.1-2016
4-Bromofluorobenzene [surr]	%	104		4/23/20 11:31	B004371	EPA 624.1-2016
1,2-Dichloroethane-d4 [surr]	%	104		4/23/20 11:31	B004371	EPA 624.1-2016
Toluene-d8 [surr]	%	99.1		4/23/20 11:31	B004371	EPA 624.1-2016

Wet Chemistry	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Ammonia as N	mg/L	**128**		4/29/20 11:06	B004475	SM 4500-NH3 B,D,C-2011
Cyanide (total)	mg/L	< 0.010	E3	4/29/20 8:00	B004465	SM 4500-CN B,E-2011
Flashpoint	°C	Did Not Flash	DNF*	4/30/20 14:30	B004506	SW 1010A, Rev 1, 2004
Oil and Grease	mg/L	< 5.18		4/29/20 8:21	B004467	EPA1664 Mod, Rev. B 2010
Sulfide	mg/L	< 0.150		4/23/20 13:43	B004379	SM 4500-S2 D-2011
TDS	mg/L	**1650**		4/24/20 12:31	B004416	SM 2540 C-2011
TOC	mg/L	**108**		4/28/20 7:30	B004464	SM 5310 B-2011

Arkansas Analytical Inc.

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205
Project: NABORS Landfill Leachate Sample(s)
Project Number: April 2020
Date Received: 22-Apr-20 14:32

ANALYTICAL RESULTS

Lab Number:	**2004351-02**
Sample Name:	**Leachate Duplicate**
Date/Time Collected:	**4/20/20 10:20**
Sample Matrix:	**Leachate**

Anions	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Chloride	mg/L	**461**		4/23/20 15:21	B004378	EPA 300.0, 2.1-1993
Sulfate as SO4	mg/L	**3.10**		4/24/20 7:39	B004378	EPA 300.0, 2.1-1993

Total Metals	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Antimony	ug/L	< 2.08		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Arsenic	ug/L	**18.3**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Barium	ug/L	**1400**		4/23/20 15:19	B004368	EPA 200.8, Rev. 5.4(1994)
Beryllium	ug/L	< 0.260		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Cadmium	ug/L	< 0.260		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Chromium	ug/L	**6.66**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Cobalt	ug/L	**15.0**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Copper	ug/L	**40.7**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Iron	ug/L	**11700**		4/23/20 15:15	B004368	EPA 200.8, Rev. 5.4(1994)
Lead	ug/L	**2.98**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Manganese	ug/L	**844**		4/23/20 15:19	B004368	EPA 200.8, Rev. 5.4(1994)
Mercury	ug/L	< 0.200		4/28/20 16:16	B004428	SW7470A/EPA245.1,3.0- 1994
Nickel	ug/L	**59.3**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Phosphorus	mg/L	**0.381**		4/28/20 10:58	B004420	EPA 200.7, Rev 4.4 (1994)
Selenium	ug/L	< 2.08		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Silver	ug/L	< 0.260		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Thallium	ug/L	< 0.260		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Tin	ug/L	< 20.8		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Vanadium	ug/L	**4.99**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)
Zinc	ug/L	**149**		4/23/20 14:35	B004368	EPA 200.8, Rev. 5.4(1994)

Volatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
1,1-Dichloroethane	ug/L	**0.969**	J	4/23/20 11:59	B004371	EPA 624.1-2016
1,1-Dichloroethene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,1,1-Trichloroethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,1,2-Trichloroethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,1,2,2-Tetrachloroethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,2-Dichlorobenzene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,2-Dichloropropane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,2-Dichloroethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,3-Dichlorobenzene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
1,4-Dichlorobenzene	ug/L	**4.92**	J	4/23/20 11:59	B004371	EPA 624.1-2016
2-Chloroethyl Vinyl Ether	ug/L	< 5.00	E21	4/23/20 11:59	B004371	EPA 624.1-2016
Acrylonitrile	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Benzene	ug/L	**3.98**	J	4/23/20 11:59	B004371	EPA 624.1-2016
Bromodichloromethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Bromoform	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Acrolein	ug/L	< 20.0		4/23/20 11:59	B004371	EPA 624.1-2016
Bromomethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016

Arkansas Analytical Inc.

05 May 2020

Tom Huetter
Harbor Environmental & Safety
5800 Evergreen Dr.
Little Rock, AR 72205
Project: NABORS Landfill Leachate Sample(s)
Project Number: April 2020
Date Received: 22-Apr-20 14:32

ANALYTICAL RESULTS

Lab Number: 2004351-02
Sample Name: Leachate Duplicate
Date/Time Collected: 4/20/20 10:20
Sample Matrix: Leachate

Volatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Carbon tetrachloride	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Chlorobenzene	ug/L	**2.07**	J	4/23/20 11:59	B004371	EPA 624.1-2016
Dibromochloromethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Chloroethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Chloroform	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Chloromethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
cis-1,3-Dichloropropene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Ethylbenzene	ug/L	**9.41**		4/23/20 11:59	B004371	EPA 624.1-2016
Methylene chloride	ug/L	< 15.0		4/23/20 11:59	B004371	EPA 624.1-2016
Tetrachloroethene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Toluene	ug/L	**1.11**	J	4/23/20 11:59	B004371	EPA 624.1-2016
trans-1,2-Dichloroethene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Trichloroethene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
trans-1,3-Dichloropropene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Vinyl chloride	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
Trichlorofluoromethane	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
cis-1,2-Dichloroethene	ug/L	< 5.00		4/23/20 11:59	B004371	EPA 624.1-2016
4-Bromofluorobenzene [surr]	%	103		4/23/20 11:59	B004371	EPA 624.1-2016
1,2-Dichloroethane-d4 [surr]	%	103		4/23/20 11:59	B004371	EPA 624.1-2016
Toluene-d8 [surr]	%	99.5		4/23/20 11:59	B004371	EPA 624.1-2016

Wet Chemistry	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Ammonia as N	mg/L	**121**		4/29/20 11:06	B004475	SM 4500-NH3 B,D,C-2011
Cyanide (total)	mg/L	< 0.010	E3	4/29/20 8:00	B004465	SM 4500-CN B,E-2011
Flashpoint	°C	Did Not Flash	DNF*	4/30/20 14:30	B004506	SW 1010A, Rev 1, 2004
Oil and Grease	mg/L	< 5.18		4/29/20 8:21	B004467	EPA1664 Mod, Rev B 2010
Sulfide	mg/L	< 0.150		4/23/20 13:43	B004379	SM 4500-S2 D-2011
TDS	mg/L	**1600**		4/24/20 12:31	B004416	SM 2540 C-2011
TOC	mg/L	**108**		4/28/20 7:30	B004464	SM 5310 B-2011

05 May 2020

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Little Rock, AR 72205
Project: NABORS Landfill Leachate Sample(s)
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QUALITY CONTROL RESULTS

Total Metals -- Batch: B004368 (Water)
Prepared: 23-Apr-20 08:32 By: SP -- Analyzed: 23-Apr-20 12:53 By: SP

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Antimony	<2.08 ug/L	99.6% / NA	109% / 100%		8.10%	
Arsenic	<0.260 ug/L	102% / NA	112% / 111%		0.935%	
Barium	<0.260 ug/L	108% / NA	104% / 106%		1.01%	
Beryllium	<0.260 ug/L	101% / NA	108% / 100%		7.73%	
Cadmium	<0.260 ug/L	106% / NA	103% / 101%		1.60%	
Chromium	<0.260 ug/L	102% / NA	99.9% / 99.1%		0.820%	
Cobalt	<0.260 ug/L	102% / NA	105% / 105%		0.489%	
Copper	<0.260 ug/L	104% / NA	104% / 104%		0.482%	
Iron	<20.8 ug/L	102% / NA	106% / 105%		0.597%	
Lead	<0.260 ug/L	102% / NA	103% / 101%		2.35%	
Manganese	<0.520 ug/L	105% / NA	111% / 103%		6.75%	
Nickel	<0.52 ug/L	104% / NA	104% / 104%		0.396%	
Selenium	<2.08 ug/L	97.2% / NA	113% / 96.8%		15.3%	
Silver	<0.260 ug/L	102% / NA	101% / 99.0%		1.74%	
Thallium	<0.260 ug/L	102% / NA	102% / 100%		2.11%	
Tin	<20.8 ug/L	104% / NA	105% / 103%		2.44%	
Vanadium	<0.260 ug/L	103% / NA	104% / 99.9%		3.86%	
Zinc	<20.8 ug/L	103% / NA	107% / 110%		1.34%	

Volatiles -- Batch: B004371 (Water)
Prepared: 23-Apr-20 09:17 By: TB -- Analyzed: 23-Apr-20 21:23 By: TB

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
1,1,1-Trichloroethane	<0.090 ug/L	102% / NA	110% / 104%		4.99%	
1,1,2,2-Tetrachloroethane	<0.290 ug/L	102% / NA	114% / 107%		5.84%	
1,1,2-Trichloroethane	<0.090 ug/L	97.9% / NA	106% / 98.8%		7.37%	
1,1-Dichloroethane	<0.120 ug/L	104% / NA	110% / 105%		4.22%	
1,1-Dichloroethene	<0.140 ug/L	115% / NA	123% / 119%		3.17%	
1,2-Dichlorobenzene	<0.070 ug/L	99.7% / NA	104% / 98.8%		5.24%	
1,2-Dichloroethane	<0.090 ug/L	103% / NA	110% / 104%		5.07%	
1,2-Dichloropropane	<0.220 ug/L	101% / NA	105% / 99.4%		5.55%	
1,3-Dichlorobenzene	<0.070 ug/L	101% / NA	105% / 99.8%		4.90%	
1,4-Dichlorobenzene	<0.080 ug/L	97.4% / NA	101% / 96.5%		4.74%	
2-Chloroethyl Vinyl Ether	<0.110 ug/L	54.2% / NA	MBI / MBI		%	E21, MBI
Acrolein	<1.10 ug/L	100% / NA	106% / 101%		4.86%	
Acrylonitrile	<0.240 ug/L	107% / NA	120% / 115%		4.04%	
Benzene	<0.080 ug/L	103% / NA	109% / 103%		4.87%	
Bromodichloromethane	<0.120 ug/L	103% / NA	111% / 103%		6.83%	
Bromoform	<0.160 ug/L	89.5% / NA	97.0% / 90.2%		7.27%	
Bromomethane	<0.240 ug/L	101% / NA	98.3% / 94.1%		4.33%	
Carbon tetrachloride	<0.170 ug/L	98.3% / NA	105% / 103%		2.13%	
Chlorobenzene	<0.100 ug/L	100% / NA	105% / 99.8%		5.42%	
Chloroethane	<0.150 ug/L	104% / NA	104% / 102%		2.58%	
Chloroform	<0.200 ug/L	101% / NA	106% / 100%		5.42%	
Chloromethane	<0.150 ug/L	93.2% / NA	100% / 93.9%		6.36%	
cis-1,2-Dichloroethene	<0.120 ug/L	105% / NA	109% / 105%		3.74%	
cis-1,3-Dichloropropene	<0.090 ug/L	99.9% / NA	101% / 95.5%		5.65%	

05 May 2020

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Project: NABORS Landfill Leachate Sample(s)

Project Number: April 2020
Date Received: 22-Apr-20 14:32

QUALITY CONTROL RESULTS

Volatiles -- Batch: B004371 (Water)
Prepared: 23-Apr-20 09:17 By: TB -- Analyzed: 23-Apr-20 21:23 By: TB

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Dibromochloromethane	<0.130 ug/L	101% / NA	108% / 99.8%		7.86%	
Ethylbenzene	<0.080 ug/L	98.1% / NA	105% / 99.5%		4.77%	
Methylene chloride	<0.700 ug/L	98.8% / NA	103% / 99.3%		3.99%	
Tetrachloroethene	<0.130 ug/L	94.7% / NA	98.5% / 95.7%		2.93%	
Toluene	<0.080 ug/L	99.8% / NA	105% / 98.8%		6.30%	
trans-1,2-Dichloroethene	<0.080 ug/L	112% / NA	121% / 115%		5.28%	
trans-1,3-Dichloropropene	<0.120 ug/L	101% / NA	103% / 96.8%		6.50%	
Trichloroethene	<0.280 ug/L	95.1% / NA	102% / 98.3%		3.30%	
Trichlorofluoromethane	<0.130 ug/L	93.1% / NA	102% / 100%		1.91%	
Vinyl chloride	<0.010 ug/L	97.0% / NA	103% / 101%		1.78%	
1,2-Dichloroethane-d4 [surr]	106 %	106% / NA	104% / 104%		NA	
4-Bromofluorobenzene [surr]	103 %	102% / NA	102% / 103%		NA	
Toluene-d8 [surr]	99.1 %	101% / NA	100% / 101%		NA	

Anions -- Batch: B004378 (Water)
Prepared: 23-Apr-20 12:59 By: MB -- Analyzed: 23-Apr-20 22:26 By: MB

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Chloride	<0.500 mg/L	90.4% / NA	100% / 100%		0.00%	
Sulfate as SO4	<0.500 mg/L	95.7% / NA	107% / 107%		0.251%	

Wet Chemistry -- Batch: B004379 (Water)
Prepared: 23-Apr-20 13:43 By: SPS -- Analyzed: 23-Apr-20 13:43 By: CNW

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Sulfide	<0.150 mg/L	131% / NA	180% / 163%		9.91%	

Wet Chemistry -- Batch: B004416 (Water)
Prepared: 24-Apr-20 12:31 By: AA -- Analyzed: 24-Apr-20 12:31 By: AA

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
TDS	<5.00 mg/L	97.3% / 99.3%	NA / NA		2.03%	

Total Metals -- Batch: B004420 (Water)
Prepared: 27-Apr-20 07:33 By: SP -- Analyzed: 28-Apr-20 09:46 By: SP

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Phosphorus	<0.036 mg/L	102% / NA	102% / 105%		2.62%	

Arkansas Analytical Inc.

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QUALITY CONTROL RESULTS

Total Metals -- Batch: B004428 (Water)
Prepared: 27-Apr-20 10:35 By: ST -- Analyzed: 28-Apr-20 16:16 By: ST

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Mercury	<0.200 ug/L	107% / NA	105% / 105%		0.00%	

Wet Chemistry -- Batch: B004464 (Water)
Prepared: 28-Apr-20 07:30 By: SPS -- Analyzed: 28-Apr-20 07:30 By: SPS

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
TOC	<1.00 mg/L	95.6% / NA	96.2% / 97.4%		0.414%	

Wet Chemistry -- Batch: B004465 (Water)
Prepared: 29-Apr-20 08:00 By: SPS -- Analyzed: 29-Apr-20 08:00 By: SPS

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Cyanide (total)	<0.010 mg/L	107% / NA	98.0% / 95.0%		3.02%	

Wet Chemistry -- Batch: B004467 (Water)
Prepared: 29-Apr-20 08:21 By: JH -- Analyzed: 29-Apr-20 08:21 By: JH

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Oil and Grease	<5.00 mg/L	90.5% / 100%	89.6% / NA		10.1%	

Wet Chemistry -- Batch: B004475 (Water)
Prepared: 29-Apr-20 11:06 By: AA -- Analyzed: 29-Apr-20 11:06 By: AA

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Ammonia as N	<0.500 mg/L	86.2% / 84.9%	87.1% / NA		1.45%	

Wet Chemistry -- Batch: B004506 (Water)
Prepared: 30-Apr-20 14:20 By: CNW -- Analyzed: 30-Apr-20 14:30 By: CNW

Analyte	BLK	LCS / LCSD	MS / MSD	Dup	RPD	Qualifiers
Flashpoint	NA	107% / 107%	NA / NA		0.00%	

QUALIFIER(S)

DNF: Did not flash at or below method required temperatue of 100 degrees C or 212 degrees F.
*E20: Estimated Result Due to Matrix Spike and/or Matrix Spike Duplicate Failure; This sample was used as the "parent sample" in MS/MSD prep.
*E21: Estimated Result; This Analyte failed (low) in the CCV.
*E3: Estimated Result Due to Incorrect Sample Preservation or Container
*J: Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
*MBI: Masked By Interference

Arkansas Analytical Inc.

05 May 2020

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All Analysis performed according to EPA approved methodology when available:
SW 846, Revised December, 1996; EPA 600/4-79-020, Revised March, 1983; Standard Methods.
Instrument calibration and quality control samples performed at or above frequency specified in analytical method.

Reviewed by: Norma James / Teresa Coins

Norma James and/or Teresa Coins
Technical Director and/or QA Officer

Arkansas Analytical Inc.

8100 National Drive
Little Rock, AR 72209
PHONE: 501-455-3233
FAX: 501-455-6118

Document ID 78662

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	Project Description	Turnaround Time
Harbor Environmental & Safety	NABORS Landfill	1 Day (100%)
5800 Evergreen Dr.	Leachate Sample	2 Day (50%)
Little Rock, AR 72205	Reporting Information	3 Day (25%)
	Telephone: 501-663-8800	5 Day (Routine)
Attn: Tom Huetter	Email: thuetter@harborenv.com	Preservative Code:
		Bottle Type:

Preservation Codes:

1. Cool, 6 Degrees Centigrade
2. Sulfuric Acid (H_2SO_4), pH < 2
3. Nitric Acid (HNO_3), pH < 2
4. Thiosulfate for Dechlorination
5. Hydrochloric Acid(HCl)
6. Sodium Hydroxide (NaOH), pH > 12

Sampler(s) Signature	Sampler(s) Printed

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	TEST PARAMETERS: Volatiles (624)	Chloride, Sulfate, Flashpoint, TDS	Ammonia	Cyanide	Oil and Grease	Sulfide	TOC	P (200.7), Hg	200.8-(Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Ag, Tl, Sn, V, Zn)	Arkansas Analytical Work Order Number:
							Preservative Code:	1,5	1	1,2	1,6	1,2	1,6,Zn Acetate	1,5	1,3		
							Bottle Type:	GV	P	P	P	GA	P	GV	P		Bottle Type Code: G = Glass; P = Plastic; V = Septum; A = Amber
Leachate	4-20-20	1020	X		11	W	Tank Leachate	✓	✓	✓	✓	✓	✓	✓	✓	✓	01
Leachate Dup.	4-20-20	1020	X		11	W	Leachate Duplicate	✓	✓	✓	✓	✓	✓	✓	✓	✓	02

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)
	4/22/20 1432	
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)
		Sydney James

SAMPLE CONDITION UPON RECEIPT IN LAB

1. CUSTODY SEALS:	✓ Yes	___ No
2. CONTAINERS CORRECT:	___ Yes	___ No
3. COC/LABELS AGREE:	___ Yes	___ No
4. RECEIVED ON ICE:	___ Yes	___ No
5. TEMPERATURE ON RECEIPT:	2 °C	
6. TEMPERATURE GUN ID:	HHT# 2	

FOR COMPLETION BY LAB ONLY

REMARKS / SAMPLE COMMENTS

Revision 3
1/4/16