



Memorandum

TO: Robert Worstall – ODNR Deputy Chief
Kurt Kollar – OEPA On-Scene Coordinator

FROM: John McCollums – Project Manager
Stace Bieber – Senior Project Manager/Rapid Response Coordinator

DATE: April 27, 2015

RE: Results of Source Sample and Proposed Indicator Parameter List for the KDA, Inc. Release Site in Vienna, Ohio; KDA001.300.0003

Mr. Worstall and Mr. Kollar,

This document has been prepared to present the analytical results of the source material sample, contaminants of concern (COC) identified, and the proposed indicator parameters to be used for this project.

Source Sample Results and COC Summary

To determine the COCs present in the unconventional oil and natural gas extraction wastewater released at the Site, Hull collected a sample (KDA001:Product:P040915) of the free liquids contained in the secondary containment of the tank battery on April 9, 2015. This sample is representative of the oil and natural gas extraction wastewater released on or about March 31, 2015.

The product sample was chemically analyzed for volatile organic compounds (VOCs) by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, arsenic, barium, cadmium, chromium, lead, selenium, and silver by EPA Method 6010, mercury by EPA Method 7471, TENORM by EPA Method 901.1, and chloride by EOX SW846 Method 9023, respectively.

Review of the product sample results indicated that no SVOCs, arsenic, cadmium, chromium, lead, selenium, silver or mercury were detected in the sample, and accordingly these COCs will be eliminated from future analysis.

The following COCs were detected in excess of their respective method detection limits (MDLs) and will remain indicator parameters: barium, benzene, toluene, ethylbenzene, and total xylenes (collectively known as BTEX), sec-butylbenzene, n-hexane, isopropylbenzene (cumene), p-isopropyltoluene, n-propylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene (collectively known as TMBs). Refer to **Attachment A** for a copy of the Pace Analytical laboratory report.

As of the date of this memo, the TENORM and chloride results have not been received. A copy of these results will be provided upon request. Due to the known make up of oil and natural gas extraction wastewater that was released, TENORM and chloride will remain COCs and be included in future analysis.

Proposed Indicator Parameter List

Based on the analysis of the source material, Hull proposes the following indicator parameters be used to determine the nature and extent of the release and document the effectiveness of future remedial actions:

- TENORM (e.g. Radium-226 & Radium-228);
- BTEX (e.g. benzene, toluene, ethylbenzene, and total xylenes);
- TMBs (e.g. 1,2,4-trimethylbenzene & 1,3,5-trimethylbenzene);
- Select Additional VOCs Including;
 - sec-butylbenzene
 - isopropylbenzene (cumene)
 - n-propylbenzene
 - p-isopropyltoluene
 - n-hexane
- Barium;
- Chloride; and
- Bromide.

Hull, on behalf of KDA, respectfully requests concurrence from the Ohio Department of Natural Resources (ODNR) and the Ohio Environmental Protection Agency (OEPA) of the above indicator parameter list. Upon receipt of written approval from ODNR and OEPA, Hull will include the above list of indicator parameters in the Field Sampling and Analysis Plan (FSAP) and associated detailed work plans currently being prepared.

Should you have any questions or concerns about this memorandum or the information contained herein, please do not hesitate to contact John McCollums at (724) 971-0788 or Stace Bieber at (419) 304-5418.

SUMMARY OF DETECTION

Project: KDA001
Pace Project No.: 50117128

Lab Sample ID	Client Sample ID					
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50117128001	KDA001:PRODUCT:P040915					
EPA 6010	Barium	6.2	mg/kg	2.0	04/23/15 21:56	
EPA 8260	Benzene	10700	ug/kg	5000	04/23/15 01:06	
EPA 8260	sec-Butylbenzene	48300	ug/kg	5000	04/23/15 01:06	
EPA 8260	Ethylbenzene	266000	ug/kg	5000	04/23/15 01:06	
EPA 8260	n-Hexane	125000	ug/kg	5000	04/23/15 01:06	
EPA 8260	Isopropylbenzene (Cumene)	85800	ug/kg	5000	04/23/15 01:06	
EPA 8260	p-Isopropyltoluene	86300	ug/kg	5000	04/23/15 01:06	
EPA 8260	n-Propylbenzene	109000	ug/kg	5000	04/23/15 01:06	
EPA 8260	Toluene	665000	ug/kg	25000	04/23/15 16:59	
EPA 8260	1,2,4-Trimethylbenzene	1250000	ug/kg	25000	04/23/15 16:59	
EPA 8260	1,3,5-Trimethylbenzene	1090000	ug/kg	25000	04/23/15 16:59	
EPA 8260	Xylene (Total)	3980000	ug/kg	50000	04/23/15 16:59	ES

REPORT OF LABORATORY ANALYSIS

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