CHRISTOPHER HARRIS
ATTORNEY
1511 WEST BABCOCK
BOZEMAN, MONTANA 59715
406 586-9902
406 586-9903 (FAX)
GALLATING@AOL.COM

November 12, 2013

Honorable Mathy Stanislaus
Assistant Administrator
Office of Solid Waste and Emergency Response
United States Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Petition for Non-Waste Determination for Off-Specification Used Oil Fuel

Dear Mr. Stanislaus:

Pursuant to 40 CFR §241.3(b)(2), NORA, An Association of Responsible Recyclers, Inc. ("NORA"), formerly the National Oil Recyclers Association, hereby petitions the U.S. Environmental Protection Agency ("EPA") for a determination that off-specification ("off-spec") used oil fuel does not constitute a waste when combusted in specific categories of combustion units. As demonstrated below, off-spec used oil fuel meets the Agency's legitimacy criteria for fuels set forth in 40 CFR §241.3(d)(1) including the requirement that the material must contain contaminants at levels comparable to or less than those in traditional fuel which the combustion unit is design to burn.

In addition, NORA petitions EPA to modify its description of off-spec used oil fuel in the context of applying the Non Hazardous Secondary Materials ("NHSM") rule[1] to exclude flashpoint. Flashpoint is not within the rule's definition of contaminant, and a low flashpoint does not affect the usefulness of off-spec oil as a fuel. Accordingly, if a used oil fuel would be considered off-spec only because it had a flashpoint of below 100 degrees F., NORA requests that

---

[1] *Commercial and Industrial Solid Waste Incineration Units: Reconsideration and Final Amendments; Non Hazardous Secondary Materials That Are Solid Waste,* Final Rule, 78 Fed. Reg. 9112 (February 7, 2013).

[2] For comparison it should also be noted that several light fuel oils such as kerosene also can have flash points at or below 100 degrees F, and gasoline virtually always has a flash point that is significantly lower than that level.

only for the purpose of the NHSM rule, such used oil fuel would be classified as on-specification ("on-spec").[2]

As explained below on pages 14 and 15 of this petition, NORA also requests that EPA confirm that off-specification used oil that is a hazardous waste solely because it exhibits a hazardous characteristic is not a non-hazardous secondary material.

I. Background and Justification for the Proposed Action

NORA was founded in December 1984 and has participated in every major federal rule-making relating to used oil including the used oil management standards, now codified at 40 CFR Part 279, as well as the rule-making concerning non-hazardous secondary materials. NORA's more than 350 members collect, transport, process and market used oil and other recyclable materials such as antifreeze, oil filters and oily wastewater throughout the United States.

The original used oil management standards, promulgated in November 1985, established the categories of on-spec and off-spec used oil fuel. 40 CFR §279.11. With respect to "on specification" used oil fuel, the Agency has stated: "Based on how we define traditional fuels (i.e. fuels that have been historically managed as valuable fuel products rather than being managed as waste materials), we believe that on-spec used oil fuel should be considered a traditional fuel." 75 Fed. Reg. 31864. See also 76 Fed. Reg. 80481, fn. 44. Because on-spec and off-spec used oil fuel are collected, processed and managed in virtually the same way[3], off-spec used oil fuel would automatically satisfy all of the legitimacy criteria except the contaminants comparison. In addressing the contaminants comparison, EPA originally was of the view that liquids such as off-spec used oil fuel could not be compared to solid fuels such as coal. However, in the preamble to the final NHSM rule, EPA modified its position. Specifically, EPA responded to NORA's comment:

> Comment: In the proposed rule, EPA specifically addressed used oil stating: "Used oil is a special case and does not need to undergo the contaminant comparison. If it meets the specifications in 40 CFR 279.11, it is a traditional fuel. If it does not meet the specifications (i.e., it is "off-spec" oil), it is a solid waste under the 2011 NHSM final rule.'' 76 FR 80481, fn. 44. Some commenters argued that off-spec used oil fuel, however, could satisfy all of

[2] For comparison it should also be noted that several light fuel oils such as kerosene also can have flash points at or below 100 degrees F, and gasoline virtually always has a flash point that is significantly lower than that level.

[3] See Affidavit of James Noble, President, Noble Oil Services, Inc., September 20, 2013, ¶ 4 and Affidavit of Donald A. Littlefield, October 25, 2013, ¶¶ 4-6. (Attachment A).

EPA's legitimacy criteria, including a contaminant comparison with coal, a traditional fuel. Thus, if a combustion unit is "designed to burn" both coal and oil, the facility should be able to use coal as the traditional fuel for the purposes of determining whether the contaminants are comparable—even when the NHSM at issue is off-spec used oil, as defined in 40 CFR 279.11.

Response: *The Agency agrees with the commenter that contaminants in off-spec used oil burned for energy recovery in facilities that are designed to burn coal may be compared to coal for purposes of determining whether the off-spec used oil is a waste or non-waste product fuel. Accordingly, for purposes of waste/non-waste determinations, coal or oil, including on-spec used oil can be used as the traditional fuel identified for comparison of contaminants to meet the legitimacy criterion for units designed to burn both fuels.* [Emphasis added.] Some combustion units are designed to burn multiple fuels, such as both coal and oil, including on-spec used oil. Under these circumstances, the Agency agrees that the rules allow the comparison of contaminant levels to either traditional fuel. That is, to be designated as a non-waste, the off-spec used oil contaminant levels must be comparable to or lower than coal when coal is the traditional fuel used for comparison.

EPA no longer finds, as stated in Footnote 44 of the proposed rule, that off-spec used oil is always a waste for facilities that are designed to burn coal. Off-spec used oil continues to be a waste, however, for facilities that are not designed to burn coal because off-spec used oil contains contaminant levels that are not comparable to on-spec used oil. EPA also notes that in the preamble to the March 2011 rule (p. 15506), the Agency specifically rejected the comparison of off-specification used oil contaminants to coal. That discussion, however, was in the context of a general contaminant comparison for units that burn only fuel oil. Coal may not be the comparison material for all off-specification used oil, but only for those facilities that are designed to burn coal as provided in the definition of this rule. Finally, we want to make clear that EPA has not modified the part 279 regulations for management of used oil, and thus, burning of off-spec used oil for energy recovery is still subject to those rules, including the requirement that off-spec used oil can only be burned in certain units (see 40 CFR 279.61(a)).

78 Fed. Reg. 9150 (February 7, 2013)

In light of this very important clarification, NORA (1) demonstrates that many categories of industrial furnaces are capable of burning liquid fuels and/or solid fuels; and (2) resubmits the data comparing off-spec used oil fuel contaminants and the contaminants typically found in coal.

A. Cement Kilns and Other Industrial Combustion Units Burn Solids Such as Coal and Liquids Such as Used Oil.

It is well established that most cement kilns and many other industrial furnaces have the capacity and are designed to burn fuel that is either liquid or solid in form. *See* Gabbard and Gossman, *Waste Fuels and Cement Kilns: The Incineration Alternative, ASTM Standardization News*, September 1990.

> A medium size rotary cement kiln has an enormous appetite for energy, consuming up to 300 million Btu/h....Energy typically comes from coal....But it is not uncommon today to see used tires, spent solvents, blended paint wastes, *used oil*, petroleum residues, wood chips...and many more sources of energy routinely in use. [Emphasis added.]

This information is consistent with the leading authority on rotary cement kilns who has stated that fuels that have been used for primary firing include coal, petroleum coke, heavy fuel oil, natural gas, landfill off-gas and oil refinery flare gas. *See* K.E. Peray, *The Rotary Cement Kiln.* CHS Press, 1998, ISBN 978-08206-0367-4 (chapter 4). Indeed, the science of burning liquid fuels in cement kilns is as refined as for solid fuels. In his book, *Rotary Kilns: Transport Phenomena and Transport Processes,* A. A. Boateng devotes a full subchapter to the subject of fuel oil firing of rotary kilns. The excerpt below illustrates how carefully the combustion of liquid fuels in cement kilns has been studied.

> Atomization is to liquid fuels as pulverization is to solid fuels. Atomization is required to break down liquid fuel oil into tiny droplets prior to combustion. Droplet combustion follows the same model as char combustion shown in Figure 6.9. The size of the droplets and the way they are dispersed has a critical affect on burner performance. Like pulverized solid fuel, the ignition temperature of fuel oils is much lower than gas, so the mixing is the rate-controlling step in the combustion process. Although some light fuel oils, for example kerosene, may readily vaporize and mix with the oxidant prior to ignition, heavy fuel oils, which are frequently used in rotary kilns, need to be spray-atomized into the secondary air to ensure adequate mixing. The droplet combustion process is similar to coal combustion, starting with initial heating and flaming pyrolysis, which releases volatiles and a porous sphere of coke particles known as a cenosphere.

See A. A. Boateng, *Rotary Kilns: Transport Phenomena and Transport Processes,* Butterworth Heineman Press, 2008, ISBN 978-0-7506-7877-3, p. 149.

According to the U.S. Environmental Protection Agency,

> The cement industry is highly dependent on emissions-intensive energy sources: coal (60 percent of fuel inputs in 2004) and petroleum coke (16 percent). In recent years, the sector has shown increased use of lower-cost waste fuels (primarily tires *and used motor oil*), and slight decreases in the use of natural gas and coal.[4] In 2002, 15 plants used waste oil, and 40 plants in 23 states used scrap tires; solvents, unrecyclable plastics, and other waste materials were also used as fuels. [Emphasis added.]

See U.S. Environmental Protection Agency, *Energy Trends in Selected Manufacturing Sectors: Opportunities and Challenges for Environmentally Preferable Energy Outcomes, Final Report*, March 2007, pp. 3-12.

A typical example of a cement kiln that burns both liquids and solids is the Brooksville South Cement Plant in Brooksville, Florida (operated by Cemex Construction Materials Florida, LLC). Its current permit, granted by the Florida Department of Environmental Protection, allows the plant to burn solids, liquids and gas including coal, natural gas, petroleum coke, propane, used oil and whole tires.

Significantly, EPA has specifically examined the potential for replacing coal with used oil fuel in kilns.

> Most analysts thought it might be possible to replace 5 to 15 percent of the coal burned in a kiln with used oil without significantly altering the steady-state chemistry in the kiln. *A switch from coal to used oil of this magnitude could potentially produce significant incremental NOx reductions – particularly if the first displaced units of coal yield a disproportionate NOx emission reduction benefit. A fuel switch of this magnitude could also yield some incremental SO_2 and CO_2 emission reductions.* Similar emission reductions may also be achievable by displacing a limited amount of the coal burned in a kiln with waste solvents or tar. The introduction of waste solvents, tar or other alternative liquid fuels could, however, trigger the need for lengthy and contentious permit revisions, and it could be difficult to justify such revisions where the fuels in question would only be used for short intervals. *For this reason, used oil may be a better candidate for fuel switching as part of an episodic control strategy, particularly in cases where a cement plant is*

---

[4] These data were provided by: U.S. Department of Energy, Energy Information Administration, *Manufacturing Energy Consumption Survey, 2002*. U.S. Department of Energy, Energy Information Administration, *Manufacturing Energy Consumption Survey, 1998*.

already set up and permitted to burn used oil and has one or more dormant oil tanks. [Emphasis added.]

See U.S. Environmental Protection Agency, *Episodic Air Pollution Control Measures: Analysis of Potential Options for Industrial Sources,* January 2008, p. 33.

It should be emphasized that the use of used oil fuel (both on-specification and off-specification) in cement kilns is a standard practice. The Portland Cement Association has reported that of the 90 cement plants responding to a survey in 2009, 20 percent burned used oil and coal as fuels. The Portland Cement Association also reported that during the years 2007 through 2009 more than 30.5 million gallons of used oil fuel was burned in cement kilns.

Moreover, the burning of solids (e.g., coal) and liquids (e.g., oil) occurs in other industrial facilities such as power-generating utilities. Oil-fired burners provide a wide range of fuel flexibility that accommodates the combustion of a wide range of fuel oil grades including on-spec and off-spec used oil fuels. Coal-fired utilities often combust other fuels including on-specification and off-specification used oil in combination with coal.[5] This practice of mixing fuels is known as "co-burning." *See* EPA, *Report to Congress, Wastes From the Combustion of Fossil Fuels, Vol. 2*, March 1999, pp. 3-9. Co-burning of liquid and solid fuels is also used in the highly efficient combustion technology known as circulating fluidized beds. "Circulating fluidized bed technology has proven to be highly flexible in converting a variety of waste fuels into steam and electricity energy. Refinery residues of different forms -- highly viscous liquid as well as solid -- are now available in abundance and these are energy sources viable for cost effective steam generation." *See* Wu, Hiltunen, and Sellajumar (Foster Wheeler Development Corporation), *Combustion of Pitch/Asphalt and Related Fuels in Circulating Fluidized Beds*, 2002, p. 1. *See also* Anthony, Zhang and Lu, *The Fluidized Bed Combustion of Heavy Liquid Fuels*, Proceedings 16th International Conference on Fluidized Bed Combustion, Reno, Nevada, May 13-16, 2001; Barczus, Thorsten, Bjorn and Viktor, *Combustion of Liquid Refinery Residues in a Circulating Fluidized Bed: Experimental Investigations on the Combustion Characteristics and the Pollutant Formation,* Proceedings 16th International Conference on Fluidized Bed Combustion, Reno, Nevada, May 13-16, 2001.

In summary, virtually all cement kilns and many other industrial facilities such as steel mills are designed to burn both liquid and solid fuels and, in fact, burn a wide variety of fuels with different physical characteristics.[6] As Mr.

[5] Various liquid petroleum fuels, including distillate oil, are also used as a start-up fuel and for flame conditioning.

[6] In the preamble to the final NHSM rule EPA has concluded that "Some combustion units are designed to burn multiple fuels, such as both coal and oil, including on-spec

Boateng, an expert on rotary kiln combustion methods pointed out, "the droplet combustion process is similar to coal combustion." EPA's own study, published in 2008, indicated the feasibility -- and the environmental benefits of -- replacing "5 to 15 percent of the coal burned in a kiln with used oil without significantly altering the steady-state chemistry in the kiln." Accordingly, with respect to combustion units that burn coal for energy recovery and liquid fuels (or can burn coal or liquid fuels with modest adjustments to the combustion unit) it is entirely appropriate to compare the contaminant levels of off-spec used oil with those in coal.

B. Off-Specification Used Oil Fuel Has Lower Levels of EPA-Specified Contaminants Than Coal, a Traditional Fuel.

At NORA's request, Summit Environmental Technologies, Inc. ("Summit"), an EPA and NELAP certified analytical laboratory, reanalyzed two different batches of off-spec oil for the same contaminants EPA used in comparing tire-derived fuel ("TDF") to coal. The first time period (batch 1) consisted of any and all off-spec oil samples received by the laboratory during December 2011 through January 2012. The off-spec classification was based on the original analyses for the five regulated metals performed on the oil samples received by Summit Laboratories during that time frame. Twenty-two such samples were found to be off-spec during this period, and all were re-logged by the laboratory as Summit sample group 1202855, and reanalyzed for all fourteen contaminants used by EPA for comparisons in the NHSM rule. The second time period (batch 2) extended from February through March, 2012, during which thirteen more off-spec oil samples were discovered. These samples were re-logged for reanalysis as Summit sample group 1205114. The full results for all of these samples, and comparisons of these samples to coal and TDF are presented in Appendix B[7] to this report. It is important to note that the samples analyzed were *all* of the off-specification used oil samples received by Summit during both time periods. These samples came from numerous different sources. No pre-selection, post-selection or other screening methods were used.[8]

As Attachment B indicates, Summit conducted an analysis for fourteen contaminants – the same contaminants EPA used in comparing tire-derived fuel ("TDF") to coal. EPA has classified TDF as a legitimate alternative fuel. The levels of contaminants for coal are from EPA's Table 1, Docket ID EPA-HQ-RCRA-2008-0329-1877[1]. The results of the contaminant-comparison show that off-spec used oil compares very favorably to coal. The contaminants in off-spec used oil are significantly lower than coal in all fourteen parameters.

---

used oil." 78 Fed. Reg. 9150.

[7] Both batches are combined in the table presented in Attachment B.

[8] NORA also presented extensive sampling data on off-spec used oil when it submitted its August 3, 2010 comments on the proposed NHSM rule.

Although a comparison of off-spec used oil to TDF is not necessary for the purposes of satisfying the legitimacy criteria, it is worth noting that for several contaminants off-spec used oil has much lower levels. For example looking at the average results from Batch 1, specifically, for arsenic off-spec used oil was below 1 part per million ("ppm") and for TDF it was 25 ppm; for beryllium off-spec used oil was below 0.5 ppm and for TDF it was .53 ppm; for cadmium off-spec used oil was .38 ppm and for TDF it was 3 ppm; for chromium off-spec used oil was 23.77 ppm and for TDF it was 286 ppm; for lead off-spec used oil was 29.45 ppm and for TDF it was 340 ppm; for manganese off-spec used oil was 19.29 ppm and for TDF it was 2450 ppm; for mercury off-spec used oil was below 0.02 ppm and for TDF it was 0.035; for nickel off-spec used oil was 9.76 ppm and for TDF it was 163 ppm; for selenium off-spec used oil was below 4 parts per ppm and for TDF it was 12.2 ppm; for nitrogen off-spec used oil was 500 ppm and for TDF it was 3670 ppm; and for sulfur off-spec used oil was 2357 ppm and for TDF it was 26,100 ppm. In summary, off-spec used oil was lower than TDF in eleven out of the fourteen contaminants that are of concern to EPA. For several contaminants, off-spec used oil was more than ten times lower than TDF.

The analysis of the samples analyzed by Summit completely confirm that off-spec used oil is much cleaner than coal for all fourteen parameters and cleaner than TDF for eleven out of the fourteen parameters.

C. <u>Off-Specification Used Oil Fuel Satisfies Each of the Other Components of the Legitimacy Criteria.</u>

In addition, NORA also provides the following information demonstrating that each of the other three components of the legitimacy criteria has been satisfied for off-spec used oil fuel. First, storage of the material prior to use must not exceed reasonable time frames. Second, the material must be managed consistent with an analogous fuel. Third, the material must have meaningful heating value. Taken together, meeting these criteria establishes that off-spec used oil constitutes a valuable commodity.

1. Storage of Off-Spec Used Oil Fuel is Regulated and Does Not Exceed Reasonable Time Frames.

Management of on-spec used oil and off-spec used oil, including storage of such oil, is nearly identical.[9] Storage of both types of fuel by processors are governed by 40 CFR 279.54, Spill Prevention and Countermeasure Controls ("SPCC"), set forth at 40 CFR Part 112, as well as state regulations. Some of the specific requirements of applicable to storage of used oil at a processing facility

---

[9] See Affidavit of James Noble, President, Noble Oil Services, Inc., September 20, 2013, ¶ 4 and Affidavit of Donald A. Littlefield, October 25, 2013, ¶¶ 4-6.

are set forth at 40 CFR 279.54(a)-(e):

a) *Management units.* Used oil processors/re-refiners may not store used oil in units other than tanks, containers, or units subject to regulation under part 264 or 265 of this chapter.

(b) *Condition of units.* Containers and aboveground tanks used to store or process used oil at processing and re-refining facilities must be:

(1) In good condition (no severe rusting, apparent structural defects or deterioration); and

(2) Not leaking (no visible leaks).

(c) *Secondary containment for containers.* Containers used to store or process used oil at processing and re-refining facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

(i) Dikes, berms or retaining walls; and

(ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall; or

(iii) An equivalent secondary containment system.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

(d) *Secondary containment for existing aboveground tanks.* Existing aboveground tanks used to store or process used oil at processing and re-refining facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

(i) Dikes, berms or retaining walls; and

(ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall except areas where existing portions of the tank meet the ground; or

(iii) An equivalent secondary containment system.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

(e) *Secondary containment for new aboveground tanks.* New aboveground tanks used to store or process used oil at processing and re-refining facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

(i) Dikes, berms or retaining walls; and

(ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall; or

(iii) An equivalent secondary containment system.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

The petroleum fuel market is highly competitive and both types of used oil fuel compete with virgin fuel products.[10] Profitability in this market depends in large measure on the rapid turnover of inventory.[11] In other words, long-term storage of any petroleum product is antithetical to profitability – which requires, *inter alia,* the continuous replacement of inventory.[12] Long-term storage of off-spec used oil, while incurring ongoing storage costs, would constitute economically irrational behavior.

Moreover, for a typical used oil processor, using up valuable storage capacity on a long-term basis would create major problems on the collection side of his or her business. For used oil processors who are directly engaged in collection from used oil generators it is imperative that there be a continuous flow

[10] Affidavit of Donald A. Littlefield, October 25, 2013, ¶ 1.

[11] Letter from Bernard Snyder, FCC Environmental to Christopher Harris, August 2, 2010; Letter from Richard L. Glendye, Jr. President, Coastal Refining Corporation, July 28, 2010, p. 2. (Attachment A).

[12] Affidavit of Donald A. Littlefield, October 25, 2013, ¶ 7; Affidavit of James Noble, President, Noble Oil Services, Inc., September 20, 2013, ¶ 6.

of used oil. If a processor will not collect used oil from generators (because the processor lacks storage capacity or for any other reason) the processors will quickly lose these generator-customers to its competitors. This could result in a permanent loss of incoming feedstock.

It is axiomatic that nature abhors a vacuum. It is equally axiomatic that a competitive petroleum market abhors long-term storage of a fuel product. Incentives for profit demand short-term storage of off-spec used oil fuel.

2. Off-Spec Used Oil Fuel is Managed Consistent With an Analogous Fuel.

As stated above, management of on-spec used oil fuel and off-spec used oil fuel is nearly identical.[13] The used oil management standards, set forth in 40 CFR Part 279, governing generators, transporters and processors apply with equal force to on-spec and off-spec used oil fuel. The only significant differences relate to (1) the smaller set of burners (industrial furnaces and boilers) who may combust off-spec used oil fuel as required by 40 CFR 279.61(a); and (2) the application of the rebuttable presumption if the used oil is office because the concentration of total halogens exceeds 1000 parts per million.

Moreover, other regulatory requirements, such as SPCC regulations, apply equally to off-spec used oil and on-spec used oil.

In addition to the nearly identical impact of regulatory programs, on-spec used oil fuel and off-spec used oil fuel are managed in the same way due to market incentives.[14] As NORA pointed out in its two sets of comments submitted during the NHSM rulemaking, if the market for off-spec used oil fuel were to be eliminated, no processor would collect, store or process off-spec used oil. In our comments, NORA predicted many adverse consequences of eliminating the market for off-spec used oil fuel. However, retaining a healthy market for off-spec used oil means that off-spec used oil will be handled as a valuable fuel and in the same way that on-spec used oil is handled as a valuable fuel.

---

[13] Affidavit of James Noble, President, Noble Oil Services, Inc., September 20, 2013, ¶ ¶ 2-5.

[14] Spills or other releases of used oil will prevent the sale of that quantity of spilled product to the customer and would undermining the processor's profitability. Affidavit of Donald A. Littlefield, October 25, 2013, ¶ 7. An operator of a used oil processing facility guards against spills or other releases with the same vigilance as an operator of a petroleum refining facility or a distributor of virgin petroleum products. Affidavit of James Noble, President, Noble Oil Services, Inc., September 20, 2013, ¶ 7. Spill reporting is required by several environmental rules (including CERCLA and the Clean Water Act's SPCC regulations) and these regulations apply to the petroleum refining industry as well as the oil recycling industry. NORA suggests that the oil recycling industry will compare quite favorably with the petroleum refining industry with respect to the quantity of releases and compliance with SPCC regulations.

Accordingly, there are twin reasons for off-spec used oil to be managed in a way that is consistent with an analogous fuel, e.g., on-spec used oil fuel: (1) virtually identical regulatory controls; and (2) equal economic incentives to handle the fuels as valuable products.

3. Off-Spec Used Oil Fuel Has a Meaningful Heating Value and is Used as a Fuel to Recover Energy.

Both on-spec used oil and off-spec used oil have long been recognized as having a high BTU content[15] (more than 140,000 BTUs per gallon or 17,800 to 19,000 BTUs per pound) – which makes used oil a highly valuable fuel. Indeed, used oil has the highest BTU content of coal and TDF and any other of the materials evaluated in the context of the NHSM rulemaking.[16]

At the present there is a healthy market for off-spec used oil. Burners that purchase and use off-spec used oil as fuel include steel mills, cement kilns, lime kilns and electric energy utilities.[17] The current average price for off-spec used oil fuel (exclusive of transportation costs) is between $1.50 to $1.60 per gallon).[18]

Because a healthy market for off-spec used oil fuel has existed for a long time, generators have historically recognized its value and have managed used oil to prevent loss. Collectors have historically paid generators[19] to obtain their used oil and burners have historically purchased the used oil fuel products from processors. The value of used oil has long been recognized by both the generator, the collector, and the burner. John J. Nolan, *et al.*, *Used Oil: Disposal Options, Management Practices and Potential Liability* (3rd ed. 1990) pp. 33-38.

---

[15] Letter from Bernard Snyder, FCC Environmental to Christopher Harris, August 2, 2010; Letter from Richard L. Glendye, Jr. President, Coastal Refining Corporation, July 28, 2010, p. 1. (Attachment A).

[16] EPA has established 5000 BTUs per pound as a general guideline for meaningful heating value. See 76 Fed. Reg. 15541, 15582 (March 21, 2011).

[17] Affidavit of Donald A. Littlefield, October 25, 2013, ¶ 3.

[18] Affidavit of Bill Hinton, October 29, 2013. (Attachment A).

[19] The Automotive Oil Change Association ("AOCA") has stated that "properly managed used oil is a valuable feedstock and fast lube operators actually receive payment per gallon from licensed transporters ; current per gallon prices in some high population areas of the country range from $0.80 to $1.50…" Comments of the Automotive Oil Change Association on the proposed NHSM rule, February 20, 2012, p. 3. According to EPA's Materials Characterization Paper on used oil, recyclers [or collectors] pay between $0.60 and $1.07 per gallon of used oil. *See* p. 9.

D. Off-Spec Used Oil Fuel is Sufficiently Processed.

As noted above, off-spec used oil fuel has a high BTU content and, with processing, will meet the fuel requirements of customers.[20] Among the principal parameters for used oil fuel are water content, pour point, ash and sulfur content, BTUs and flashpoint.[21] Used oil "processors typically enter into contracts with the end users" to "ensure the material consistently meets the needs of that particular end use." *See* 75 Fed. Reg. 31877 (quoting EPA's discussion of the rationale for classifying processed scrap tires as a traditional fuel).

Processing is defined in 40 CFR 241.2 as operations that transform the material into a non-waste or non-waste ingredient including operations that remove or destroy contaminants and/or significantly improve the fuel characteristics. In its proposed NHSM rule EPA discussed transforming discarded materials (solid wastes) into "new non-waste products through legitimate processing." 75 Fed. Reg. 31876. The Agency stated that "[t]he basic principle that must be satisfied is that the discarded material[22] must undergo sufficient processing that produces either a new fuel or ingredient product. The new product must have properties that provide the end user the assurance that the material consistently satisfies the fuel/ingredient product criteria based on the type of combustion unit the secondary material is used in..." 75 Fed. Reg. 31876.

EPA has also defined "processing" of used oil in the used oil management standards as "chemical or physical operations to produce from used oil, or to make used oil more amenable for production of, fuel oil, lubricants or other used oil-derived product. Processing includes...filtration, simple distillation, chemical or physical separation and re-refining." 40 CFR §279.1 Used oil processors typically de-water used oil and use filtrations systems, chemical precipitants and centrifuge equipment to produce off-spec fuels that meet customers' needs.[23]

---

[20] Letter from Richard L. Glendye, Jr. President, Coastal Refining Corporation, July 28, 2010, p. 1.

[21] Letter from Bernard Snyder, FCC Environmental to Christopher Harris, August 2, 2010.

[22] NORA does not believe or concede that off-spec used oil constitutes a discarded material.

[23] A significant portion of NORA's membership consists of vendors and suppliers – companies that sell the equipment and treatment systems involved in used oil processing including, but limited to, pumps, filtration systems, centrifuges, centrifugal pumps, demulsifiers, tank level gauges, hydrotreaters, metal precipitants, hydrogen sulfide scavengers, software and laboratory testing and analysis. One strong indication of the used oil recycling industry's incentive in safeguarding its used oil is the significant number and diversity of equipment and insurance vendors that are exhibited at NORA conferences (held three times a year). NORA members constitute an important market for all types of petroleum management equipment as well as insurance, all of which are

Many types of off-spec used oil fuel meet applicable ASTM standards for recycled oil fuel ("RFO") such as ASTM specification 6448 RFO 5L.

The greatest quantity of off-specification used oil fuel is derived from industrial metalworking fluids that are managed at centralized waste treatment facilities located throughout the United States and permitted pursuant to EPA regulations codified at 40 CFR Part 437. The used oil (used metalworking fluids) "can be treated through heat, chemical, physical and/or distillation processes to achieve the required separation of the used oil, metals, chemicals and water."[24] In addition, "the resultant used oil recovered during these pretreatment procedures is usually further processed to remove excess solids and waters in order to enhance the Btu content and marketability of the final used oil product." *Id.* All of this processing involves multiple steps and processes. *Id.* The used oils recovered from these metalworking fluids have good BTU value -- usually greater than 140,000 BTU per gallon after processing. *Id.* Although these fuel products have high BTU value and meet customer specifications for use as a fuel they constitute off-spec fuel products because of total halogens. The halogen concentration exists because the original metal working fluid products are formulated with non-hazardous chlorinated paraffins to meet certain performance requirements. Metalworking fluids are typically designed to be emulsified in water; consequently substantial processing is required to produce used oil fuel products. *Id.* Large quantities of off-specification used oil are treated (processed) in this manner, and to a much greater extent than scrap tires.[25]

Accordingly, off-spec used oil fuel satisfies the legitimacy criteria set forth in 40 CFR 241.3(d)(1) including the contaminant comparison to coal.

Request for Confirmation of Status of Off-Specification Used Oil That Exhibits a Hazardous Characteristic.

Finally, NORA requests that EPA confirm that off-specification used oil that is a hazardous waste solely because it exhibits a hazardous characteristic is

---

intended for the purpose of protection and safe handling of this valuable asset. Used oil processing facilities have hundreds of millions of dollars invested in processing and pumping equipment, filters, storage tanks, secondary containment, sampling and analytical equipment, spill response equipment and vehicles.

[24] *See* Memorandum from John Williams, Holston Environmental Services, Inc. to Scott Parker, Chattanooga, Tennessee. Attachment A.

[25] In discussing the factor of processing -- a factor that can transform a secondary non-hazardous material into a "traditional" fuel -- EPA addressed the processing of used tires: "EPA considers used tires that have been shredded/chipped into TDF and with the metal belts or wire removed, to meet the definition of processing discussed above." 75 Fed. Reg. 31877. EPA pointed out that ASTM standards "address the size of the tire pieces and metal content in order to optimize combustion." 75 Fed. Reg. 31877-78. Similarly, off-spec used oil is processed whenever necessary in order to optimize combustion.

not a non-hazardous secondary material. Attached are the analytical laboratory results for the Toxic Characteristic Leaching Procedure ("TCLP") of five samples of off-specification used oil. Attachment C. None of these samples was mixed with any other material such as hazardous waste. These test results are submitted to EPA solely for the purpose of demonstrating that some quantity of off-specification used oil exhibits the hazardous characteristic of toxicity. NORA has not attempted to quantify this category of off-specification used oil.

As EPA is aware, 40 C.F.R. §261.6(a)(4) establishes that recycled used oil, although regulated under 40 CFR Part 279, is also a hazardous waste if it exhibits a hazardous characteristic:

> Used oil that is recycled and *is also a hazardous waste* solely because it exhibits a hazardous characteristic is not subject to the requirements of parts 260 through 268 of this chapter, but is regulated under part 279 of this chapter. Used oil that is recycled includes any used oil which is reused, following its original use, for any purpose (including the purpose for which the oil was originally used). Such term includes, but is not limited to, oil which is re-refined, reclaimed, burned for energy recovery, or reprocessed. (Emphasis added).

In promulgating the NHSM rule EPA specifically crafted a definition of non-hazardous secondary material under excludes hazardous waste: "Non-hazardous secondary material means a secondary material that, when discarded *would not be identified as a hazardous waste* under Part 261 of this chapter." 40 CFR §241.1 (Emphasis added.)

In the preamble to the final NHSM rule EPA addressed the applicability of Part 279 requirements to off-spec used oil:

> Finally, we want to make clear that EPA has not modified the part 279 regulations for the management of used oil for energy recovery, and thus, burning of off-spec used oil for energy recovery is still subject to those rules, including the requirement that off-spec used oil can only be burned in certain units (see 40 CFR 279.61(a)).

78 Fed. Reg. 9150 (February 7, 2013)

Accordingly, NORA requests that EPA confirm that off-spec used oil fuel that solely exhibits a hazardous characteristic would be regulated by 40 CFR Part 279 not 40 CFR Part 241.

II. Conclusion

For the foregoing reasons, off-spec used oil fuel satisfies the legitimacy criteria set forth in 40 CFR 241.3(d)(1) including the contaminant comparison to coal. Accordingly, NORA requests that (1) EPA grant its petition for a generic non-waste determination for off-spec used oil burned in combustion units designed to burn both coal and liquid fuels; (2) For the exclusive purpose of this non-waste determination, EPA modify its definition of on-spec used oil to include used oil that would be classified as off-spec solely because it has a flashpoint below 100 degrees. F.; and (3) EPA confirm that off-specification used oil that is a hazardous waste solely because it exhibits a hazardous characteristic is not a non-hazardous secondary material.

Respectfully submitted,

Christopher Harris
General Counsel
NORA, An Association of Responsible Recyclers

November 12, 2013

ATTACHMENT A

Affidavit of Donald A. Littlefield

I, Donald A. Littlefield, being duly sworn, state under oath as follows:

I am over the age of eighteen years.

I reside at 384 Union Street, Portsmouth, New Hampshire 03801.

I have been continuously involved in the used oil recycling industry since 1975 and am familiar with every aspect of used oil recycling operations including marketing of used oil fuel products and management of used oil recycling facilities.

I have served on the Board of Directors of NORA, An Association of Responsible Recyclers since 1990 and have served (1997-1998) as its president.

I am acquainted with hundreds of people who work in the used oil recycling industry and have visited dozens of used oil recycling facilities throughout the United States.

The following facts are based on my personal knowledge:

1. Used oil fuel products, including off-specification used oil fuel compete with numerous virgin petroleum products in America's energy markets.

2. The price of used oil fuel products fluctuates but closely follows the price of virgin fuel oil products (such as No. 2, No. 4 and No. 6 fuel oils).

3. The market for used oil fuel products, including off-specification used oil fuel, exists throughout the United States and consists of many types of permitted burners including asphalt plants, cement kilns, steel mills, power plants, and paper mills.

4. Off-specification used oil and on-specification used oil are collected, managed, and stored in the same way. Both types of used oil fuel are managed as valuable fuel products and carried on the company balance sheets as an asset and on tax returns for the IRS.

5. Off-specification used oil and on-specification used oil are typically stored in large above ground steel tanks with capacities between 10,000 to 100,000 gallons and sometimes larger.

6. Storage of off-specification fuel and on-specification used oil fuel are regulated by the used oil management standards, set forth at 40 CFR Part 279, Spill Prevention Countermeasure and Control ("SPCC") requirements (set forth at 40 CFR Part 112 and mandated by the Clean Water Act) as well as state and local regulations and permits.

7. Long-term storage of used oil would be a financial detriment to any business engaged in used oil recycling. Any business engaged in transactions in a petroleum fuel market depends on a relatively rapid and continuous series of sales. Incoming used oil is sold as quickly as possible. Consequently, short-term storage of used oil is a normal and typical routine in used oil fuel activities.

8. In the used oil industry any spill of product (off-specification used oil or on-specification used oil) costs money in terms of the lost inventory and high cleanup costs. There will also be an investigation by regulatory agencies and possible fines. Consequently, considerable effort and expense is incurred by used oil processors to stay in compliance and avoid leaks and spills.

Further Affiant Sayeth Not.

Donald A. Littlefield

October 25, 2013

Subscribed and sworn to before me this 25th day of October, 2013.

Notary Public

KATHLEEN M. NOURY
NOTARY PUBLIC
State of Connecticut
My Commission Expires
January 31, 2017

Affidavit of James Noble

I, James Noble, being duly sworn, state under oath as follows:

I am over eighteen years of age.

I am a citizen of the United States.

I reside in Cary, North Carolina.

The following facts are based on my personal knowledge:

1. In 1984 I founded Noble Oil Services, Inc. which currently provides used oil collection, transportation and recycling services in eighteen states and the District of Columbia. I am directly involved with all components of used oil recycling operations including marketing of used oil fuel products and management of used oil recycling facilities.

2. Used oil fuel products, including off-spec used oil fuel, have been an important part of the industrial fuel market in the United States for many decades.

3. The price paid by industrial burners for used oil fuel products varies but generally follows the price of virgin fuel oil products (such as No. 2, No. 4 and No. 6 fuel oils). Noble Oil Services' customers have included electric utilities, hot mix asphalt plants, cement kilns and many other industrial burners. Noble Oil Services' competitors sell into the same market.

4. Aside from being stored separately, there is virtually no difference in the way off-spec used oil and on-spec used oil are managed and stored. Both on-spec and on-spec used oil fuel are managed as valuable fuel products. Off-spec used oil and on-spec used oil are typically stored in large above ground steel tanks. The capacity of Noble Oil Service's tanks ranges from 5000 gallons to one million gallons.

5. EPA's used oil management standards (40 CFR Part 279) govern used oil recycling facilities and include requirements for storage of used oil. In addition, used oil recycling facilities are required to comply with Spill Prevention Control and Countermeasure ("SPCC") requirements set forth at 40 CFR Part 112. State and local regulations and permits impose additional requirements on storage of used oil.

6. Noble Oil Services avoids long-term storage of used oil. There is no financial or other benefit to long-term storage. Used oil recyclers benefit from processing and selling their used oil inventory on a continuous basis. Short-term storage of used oil is typical in the oil recycling industry.

7. Noble Oil Services makes every effort to prevent spills or other releases of used oil because all used oil inventory is valuable. Cleaning up spills can be expensive and time-consuming.

Further Affiant Sayeth Not.

James Noble
President
Noble Oil Services, Inc.

AFFIDAVIT

North Carolina

County of Lee

JAMES J. NOBLE, appearing before the undersigned
Name of principal

Notary and being duly sworn, says that:

1. James J. Noble

[signature]
Affiant/Principal

Sworn to (or affirmed) and subscribed before me this the 20th day of September, 2013

(Official Seal)

[signature]
Official Signature of Notary

Celia G. Scott, *Notary Public*
Notary's printed or typed name

My commission expires: 8/17/2018

CELIA G SCOTT
Notary Public
Lee County
State of North Carolina
My Commission Expires 8/17/2018

[redacted]

FCC environmental

August 2, 2010

Christopher Harris
General Council – NORA
1511 West Babcock
Bozeman, Montana 59715

I have been in the used oil recycling industry since 1972, primarily with Eastern Oil Company, one of the founders of NORA, and eventually through a series of acquisitions, with my current employer, FCC Environmental. Over this 30 year period I have been involved in every aspect of the used oil business, and can state the following, based upon personal experience:

Since well before the 1985 EPA used oil regulations came into effect, used oil has always been a valuable material; it was stored in tanks and bought and sold as a commodity. It had a high BTU value—comparable to fuel oil—and we were always able to find a good market for the recycled oil through asphalt plants and other industrial customers.

The recycling plant I operated only had storage capacity for about 7-10 days of production, and thus we never speculatively accumulated used oil. Often the used oil was in the plant for less than 24 hours. We have always stored the used oil in tanks and protected it from contamination as well as loss through spills or leaks. In general we had paid the generators well for the used oil and took many precautions to protect that value.

Used oil fuel has important advantages for our customers: it is lower in price than virgin oils; it has lower sulfur content than most residual fuel oils; it has greater heating value (BTU/gal) than #2 heating oil; it requires less pre-heating than a #6 fuel oil. Most of the oil is sold in compliance with ASTM specification 6448 RFO5L Standard Specification for Industrial Burner Fuels from Used Oil, meeting specific requirements for water content, ash, sulfur, viscosity, and other parameters. Some of our oil is sold based upon other customer-specific specifications.

Prior to 1985 and until mid-1986, most used oil did not meet the lead requirement for on-specification used oil, though automotive used oil was generally on-specification for the other requirements. It was not until some time after complete the elimination of lead in gasoline that used oil contained less than 100 ppm lead. In 1985 we were able to register our customers as off-specification used oil burners without much difficulty, and so the used oil maintained its value. In resent years, the value of off-specification oil has become somewhat less, though it remains a very marketable product.

Sincerely,

Bernard Snyder
Bernard Snyder

Hydrocarbon Recovery Services, Inc
5800 Farrington Avenue
Alexandria, VA 22304
Tel: (703) 461-2661
Fax: (703) 370-8067
www.fccenvironmental.com

CR

COASTAL REFINING CORPORATION
2830 TREMONT ROAD
SAVANNAH, GEORGIA 31405
(912) 233-9999
EPA ID # GAD 038 921 136

July 28, 2010

Environmental Protection Agency, 28221T
1200 Pennsylvania Ave., N.W.
Washington D.C., WA 20460

RE: Identification of Non-Hazardous Secondary Materials 75 Fed Reg 31844 (June 4, 2010)

In request for comments to the proposal to classify used oils as a solid waste, please allow me to state the following:

I have been in the used oil business for the past 30 years operating as Coastal Refining Corporation, a Georgia Corporation. I have a long relationship with others around the country in this industry. Based on this and my personal experience, I can state the following:

• Before the 1985 EPA used oil regulations, all used oil was handled as a valuable product. It was never considered a waste material.

• Used oil fuel was, and is, a valuable product because it has a high BTU value and there has always been a steady demand for it from customers such as asphalt plants.

• In addition to a lower price, used oil fuel has a number of advantages over virgin fuel such as much lower sulfur content.

• If the quantity of water is the same, used oil and virgin oil have almost the same high BTU content.

• Customers buying used oil fuel are interested in certain parameters such as water content, ash, viscosity, and pour point and all 279 standards.

• In the decades prior to 1985, most used oil would not have satisfied the specifications set forth in 40 CFR Part 279.

• The used oil industry (like the energy industry generally) requires that the product move quickly from generator to processor to burners. We have never engaged in long-term storage of used oil or "speculative accumulation."

• Even before these management standards, Coastal Refining Corporation and our competitors managed used oil as valuable products (not as wastes) and took all necessary precautions to avoid loss (such as spills).

• Purchases of used oil from generators and sales to customers as fuel is frequently carried out by formal contracts.

• If the used oil burning market is taken away from its' current markets of traditional fuels, I foresee massive dumping and severe misuse of this valuable product.

Sincerely,

Richard L. Glendye, Jr.
Coastal Refining Corporation

Holston ENVIRONMENTAL SERVICES, Inc.

Making a World of Difference...

TO: Scott Parker, Executive Director
NORA, an Association of Responsible Recyclers

FROM: John Williams, President

RE: Processing Methodology utilized in the Production of Off Specification Used Oil

NORA has posed the question of whether there is substantial processing involved in the production of off specification used oil?

Off specification used oil is primarily derived from the collection and processing of industrial metalworking fluids managed at many centralized wastewater treatment (CWT) facilities located throughout the United States and permitted under locally under the regulations established in 40 CFR 437. These metalworking fluids arrive at the CWT facilities in various concentrations and quality, however, they have been sent to the CWT for pretreatment as they are no longer suitable for their intended purpose. In order to meet the CWT pretreatment standards for wastewater discharge, the used oil component must be separated from the water. This requires multiple steps and process technologies. The metalworking fluid can be treated through heat, chemical, physical and distillation processes to achieve the required separation of the used oils, metals, chemicals and waters contained within the metalworking fluids. The resultant used oil recovered during these pretreatment processes is usually further processed to remove excess solids and waters to enhance the Btu content and marketability of the used oil as a fuel product. The used oils recovered from these metalworking fluids are known to have good Btu value, usually greater than 130,000 Btu/Gl after processing as described above. However, these used oil fuels tend to be off specification used oils due to chlorinated paraffins that are manufactured into the original metalworking fluid product. Due to the solubility of these metalworking fluids in water and the manufacture's intentional formulation that these fluids be emulsified with water, it is highly unusual for off specification used oil generated within the CWT environment to not have experienced extensive processing as part of its creation into a valuable used oil fuel product.

Affidavit of Bill Hinton

I, Bill Hinton, being duly sworn, state under oath as follows:

I am over the age of eighteen years.

I am a citizen of the United States.

I employed by Valicor Environmental Services, LLC ("Valicor"), located at 11807 Reading Road, Cincinnati, Ohio. Valicor is a used oil processor operating in compliance with 40 CFR Part 279.

I am Executive Vice President of NORA, an Association of Responsible Recyclers, Inc. ("NORA"), formerly the National Oil Recyclers Association.

I have worked in the used oil and wastewater treatment industries for over 14 years.

A part of my employment by Valicor requires being cognizant of and tracking the markets for used oil fuel.

As of October 2013 there is a significant market for off-spec used oil fuel.

I am knowledgeable about national and regional prices for used oil fuel products including on-specification and off-specification used oil fuel.

The prices paid by burners and blenders of off-specification used oil fuel in October 2013 was in the range of $1.50 to $1.60 per gallon, exclusive of any other charges, fees, taxes or costs such as transportation.

FURTHER AFFIANT SAYETH NOT.

Bill H[illegible]
Bill Hinton

October 29, 2013

STATE OF OHIO

COUNTY OF Montgomery

The foregoing instrument was acknowledged before me this 10 · 29 · 2013 (date) by Bill Hinton (name of person acknowledged.)

Notary Public: [signature]

Printed Name: Steve Clase

My Commission Expires: OCT, 1 2018

NOTARY PUBLIC STATE OF OHIO

ATTACHMENT B

ATTACHMENT C

Summit Laboratory Analyses of Off-Spec Used Oil for Inorganic HAP List Parameters[1]

Sample ID	Units	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Lead	Manganese	Mercury	Nickel	Selenium	Chlorine	Fluorine	Nitrogen	Sulfur
1202855-01	ppm	< 1.5	< 1.0	< 0.5	1.7	6.8	160	22	< 0.02	4.2	< 4.0	428	< 10.0	371	< 1000
1202855-02[1]	ppm	< 1.5	< 1.0	< 0.5	0.42	< 4.0	12	< 5.0	< 0.02	< 0.5	< 4.0	3470	36	372	< 1000
1202855-03	ppm	< 1.5	< 1.0	< 0.5	0.28	< 4.0	10	15	< 0.02	1.7	< 4.0	4853	43	683	3329
1202855-04	ppm	< 1.5	< 1.0	< 0.5	< 0.1	8.9	14	< 5.0	< 0.02	7.1	< 4.0	7223	219	762	1752
1202855-05	ppm	< 1.5	< 1.0	< 0.5	0.21	4.2	6.9	15	< 0.02	3.6	< 4.0	9751	59	496	1133
1202855-06	ppm	2.9	< 1.0	< 0.5	< 0.1	44	9.5	12	< 0.02	19	< 4.0	4437	96	754	4914
1202855-07	ppm	< 1.5	< 1.0	< 0.5	0.26	15.0	< 1.0	< 5.0	< 0.02	3.2	< 4.0	323	22.9	253	< 1000
1202855-08	ppm	< 1.5	< 1.0	< 0.5	0.22	< 4.0	6.9	< 5.0	< 0.02	2	< 4.0	4705	93	382	2324
1202855-09	ppm	< 1.5	< 1.0	< 0.5	1.1	160	3.8	170	< 0.02	2.3	< 4.0	2158	18	857	1102
1202855-10	ppm	< 1.5	< 1.0	< 0.5	< 0.1	< 4.0	1.8	< 5.0	< 0.02	5.7	< 4.0	9645	18.3	420	2824
1202855-11	ppm	< 1.5	< 1.0	< 0.5	< 0.1	36	8.4	13	< 0.02	36	< 4.0	36422	< 10.0	596	< 1000
1202855-12[1]	ppm	< 1.5	< 1.0	< 0.5	0.25	< 4.0	< 1.0	< 5.0	< 0.02	< 0.5	< 4.0	2354	< 10.0	< 200	< 1000
1202855-13	ppm	< 1.5	< 1.0	< 0.5	0.18	< 4.0	1.8	< 5.0	< 0.02	2.2	< 4.0	10743	47	417	3377
1202855-14[1]	ppm	< 1.5	< 1.0	< 0.5	< 0.1	< 4.0	1.4	< 5.0	< 0.02	< 0.5	< 4.0	2240	<10.0	210	2313
1202855-15	ppm	13	< 1.0	< 0.5	< 0.1	100	26	43	< 0.02	35	< 4.0	4708	109	662	4169
1202855-16	ppm	12	< 1.0	< 0.5	< 0.1	84	39	55	< 0.02	39	< 4.0	3308	77	870	4106
1202855-17	ppm	< 1.5	< 1.0	< 0.5	0.44	< 4.0	200	< 5.0	< 0.02	1	< 4.0	469	49	450	1791
1202855-18	ppm	< 1.5	< 1.0	< 0.5	0.46	< 4.0	110	< 5.0	< 0.02	0.73	< 4.0	365	41	738	1903
1202855-19[1]	ppm	< 1.5	< 1.0	< 0.5	0.38	< 4.0	5	6.1	< 0.02	7.3	< 4.0	2779	25	383	1710
1202855-20	ppm	< 1.5	< 1.0	< 0.5	0.3	< 4.0	13	11	< 0.02	19	< 4.0	6152	12	568	< 1000
1202855-21	ppm	< 1.5	< 1.0	< 0.5	< 0.1	16	14	7.2	< 0.02	21	< 4.0	7542	< 10.0	239	2019
1202855-23	ppm	< 1.5	< 1.0	< 0.5	1.3	< 4.0	2.3	5.1	< 0.02	3.1	< 4.0	29304	< 10.0	318	7096
1205114-01	ppm	< 1.5	< 1.0	< 0.5	< 0.1	5.3	8.3	11	< 0.02	6.9	< 4.0	14635	< 10.0	1162	1838
1205114-02	ppm	< 1.5	< 1.0	< 0.5	0.18	< 4.0	4	< 5.0	< 0.02	0.96	< 4.0	9736	< 10.0	254	< 1000
1205114-03	ppm	< 1.5	< 1.0	< 0.5	< 0.1	< 4.0	< 1.0	< 5.0	< 0.02	< 0.5	< 4.0	4584	< 10.0	< 200	< 1000
1205114-04	ppm	< 1.5	< 1.0	< 0.5	< 0.1	5.6	11	17	< 0.02	4.6	< 4.0	5733	< 10.0	761	1232
1205114-05	ppm	< 1.5	< 1.0	< 0.5	0.45	14	20	23	< 0.02	12	< 4.0	5409	< 10.0	352	2939
1205114-06	ppm	< 1.5	< 1.0	< 0.5	< 0.1	7.4	45	16	< 0.02	13	< 4.0	6355	< 10.0	280	3081
1205114-07	ppm	< 1.5	< 1.0	< 0.5	< 0.1	4.5	34	16	< 0.02	14	< 4.0	6868	< 10.0	226	2986
1205114-08	ppm	< 1.5	< 1.0	< 0.5	0.38	< 4.0	6.2	< 5.0	< 0.02	0.94	< 4.0	22873	< 10.0	< 200	< 1000
1205114-09	ppm	< 1.5	< 1.0	< 0.5	0.2	< 4.0	1.4	< 5.0	< 0.02	< 0.5	< 4.0	4730	1466	< 200	< 1000
1205114-10	ppm	< 1.5	< 1.0	< 0.5	1.2	< 4.0	140	< 5.0	< 0.02	0.84	< 4.0	1352	23	414	1466
1205114-11	ppm	< 1.5	< 1.0	< 0.5	< 0.1	22	27	47	< 0.02	24	< 4.0	5654	151	748	2631
1205114-12[1]	ppm	< 1.5	< 1.0	< 0.5	0.28	8.4	4.6	< 5.0	< 0.02	1.8	< 4.0	464	< 10.0	1104	1449
1205114-13	ppm	< 1.5	< 1.0	< 0.5	0.35	< 4.0	82	< 5.0	< 0.02	2.9	< 4.0	6807	78	269	3177
Average Concentration for Off-spec Used Oil	ppm	2.17	< 1.00	< 0.50	0.34	17.55	29.49	16.84	< 0.02	8.50	< 4.00	7102	83	491	2190
Range of Concentrations for Coal[2]	ppm	0.5-10	0.5-80	0.1-15	0.1-3	0.5-60	2.0-80	5-300	0.02-1	0.5-50	0.2-10	BDL-9080	BDL-178	13600-54000	740-61300
Upper End Coal Concentration Value adjusted to Match BTU Content of Used Oil[3]	ppm	15	120	22.5	4.5	90	120	450	1.5	75	15	13620	267	81000	91950

[1]Summit Laboratories performed or reperformed all these additional analyses on any off-spec used oil samples submitted to their lab by various clients approximately during the Dec 2011-Jan 2012 time frame as sample group 1202855, and all similar samples received in the time frame Feb-March, 2012 as sample group 1205114. Note: For samples 1202855-2, 12, 14, and 19 above, the total halogens procedure normally performed to determine off-spec oil gave results >4000 mg/kg, the specification level for total halogens. When the laboratory reanalyzed the oil for total chlorine, the result was <4000. These samples were retained in this list of off-spec used oil. And for Sample 1205114-12, the original chromium analysis had a result slightly above the 10 mg/kg specification limit. The re-analysis result was 8.4 mg/kg, marginally below the spec limit. This result was retained in the list, since the original oil sample was determined to be off-spec.

[2]Source: EPA Table 1, Docket ID: EPA-HQ-RCRA-2008-0329-1877[1]

[3]A factor of 1.5 was used for all pollutants to adjust for the lower BTU value of coal comapred to used oil as identified in the Nov 29, 1985 FR on the Used Oil Management Rule, page 49187.

Comparison of Contaminants in Off Spec Used Oil to Coal and Tire Derived Fuel (TDF)

Contaminant	Average Concentration for Off-spec Used Oil[1]	Coal Contaminant Concentration Range[2]	Upper End Coal Concentration Value adjusted to Match BTU Content of Oil[3]	TDF Contaminant Concentration Range[4]	Upper End TDF Concentration Value, Adjusted to Match BTU Content of Oil[5]
Antimony	2.17	0.5-10	15	NA	NA
Arsenic	<1	0.5-80	120	0.23-18	25
Beryllium	<0.5	0.1-15	22.5	BDL-0.39	0.53
Cadmium	0.34	0.1-3	4.5	0.15-2.2	3.0
Chromium	17.55	0.5-60	90	1.8-210	286
Lead	29.49	2.0-80	120	24-250	340
Manganese	16.84	5-300	450	9.1-1800	2450
Mercury	<0.02	0.02-1	1.5	.001-.026	0.035
Nickel	8.50	0.5-50	75	1.7-120	163
Selenium	<4.00	0.2-10	15	BDL-8.97	12.2
Chlorine	7102	BDL-9080	13620	1490	2030
Fluorine	83	BDL-178	267	10	13.6
Nitrogen	491	13600-54000	81000	2700	3670
Sulfur	2190	740-61300	91950	19,200	26,100

[1]Source: Summit Laboratory analyses of all off-spec used oil samples received between Dec 2011-March, 2012.

[2]Source: EPA Table 1, Docket ID: EPA-HQ-RCRA-2008-0329-1877[1]

[3]A factor of 1.5 was used for all pollutants to adjust for the lower BTU value of coal comapred to used oil as identified in the Nov 29, 1985 FR on the Used Oil Management Rule, page 49187.

[4]Source: Table 3, Docket ID: EPA-HQ-RCRA-2008-0329-1879[1].

[5]Based on the precedent used by EPA for Coal from note 3 above, a factor of 1.36 was calculated to convert the BTU from TDF to equal the BTU content of off-spec used oil, based on a BTU of 14,000/lb for TDF, and a BTU of 19,000/lb for used oil.

ATTACHMENT C

Rev. 12
Date: 07/27/13

Order ID: 1317169 COOLER

Summit Environmental Technologies, Inc.
Cooler Receipt Form

Client: Nora (Validr) — Initials of person inspecting cooler and samples: SH

Order Number: ______

Date Received: 10/30/13 Time Received: 0730 Date cooler(s) opened and samples inspected: 10/30/13

Number of Coolers/Boxes: 1 N/A

Shipper: FED EX (UPS) DHL Airborne US Postal Walk-in Pickup Other ______

Packaging: Peanuts (Bubble Wrap) Paper Foam None Other ______

Tape on cooler/box:	(Y)	N	N/A
Custody Seals intact	(Y)	N	N/A
C-O-C in plastic	(Y)	N	N/A
Ice X Blue ice ___	(present) / absent / melted		N/A
Sample Temperature IR Gun #16020459 CF ___ °C	5.9 °C		
Radiological Testing Instrument serial #35127 (see page 2 for scan results) **Use 1 sheet per sample for Radiological Testing. If sample is HOT, the Radiological Safety Officer must be notified immediately.	Y	N	N/A
C-O-C filled out properly	(Y)	N	N/A
Samples in separate bags	(Y)	N	N/A
Sample containers intact*	(Y)	N	N/A
*If no, list broken sample(s):			
Sample label(s) complete (ID, date, etc.)	(Y)	N	N/A
Label(s) agree with C-O-C	(Y)	N	N/A
Correct containers used	(Y)	N	N/A
Sufficient sample received	(Y)	N	N/A
Bubbles absent from 40 mL vials**	Y	N	(N/A)
** Samples with bubbles <6mm are acceptable. Indicate bubble size if >6mm			
Was client contacted about samples	Y	N	
Will client send new samples	Y	N	

Client contact: ______

Date/Time: ______

Logged in by: ______

Comments: ______

Summit Environmental Technologies, Inc.
3310 Win Street
Cuyahoga Falls, Ohio 44223 Tel: 330.253.8211 Fax: 330.253.4489

Analysis Request/ For Summit Environmental Page ___

Order ID: 1317169 COC

Company Name (Please Print): NORA	Project Name: NORA Samples
Company Address: —	Project Address: —
Client Phone No.	Report to: —
Client Fax No. Please Fax Results ✓ ☐	PO#
Client Email Please Email Results ✓ ☐	Quote No.
Contact Person	
Sampled by	Check if Ohio VAP samples ✓ ☐

Matrix: S=Solid, L=Liquid, O=Oil, SL=Sludge, A=Air, DW=Drinking Water

Please Check Analytical Box ✓

#	Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix	Preservative	Number of Containers	TCLP - 8 RCRA Metals	Volatiles	Semi Volatiles
1	NORA Sample 1										
	NORA Sample 2										
	NORA Sample 3										
	NORA Sample 4										
	NORA Sample 5										

1317169-01-05

Relinquished by:	Date	Time	Received by:	Date	Time
Received in lab by: Joseph Hewitt	10/30/13	0730	Rush Requested By: ___ Date ___	Must be approved by lab manager	

Notes/Comments: Attention Kenny NORA Project

White and yellow pages should accompany samples to the laboratory. The client retains the pink page.

63226

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Sample Summary

Client: NORA
Order Number: 1317169

Laboratory ID	Client ID	Matrix	Sampling Date
1317169-01	Sample 1	Liquid	10/29/2013
1317169-02	Sample 2	Liquid	10/29/2013
1317169-03	Sample 3	Liquid	10/29/2013
1317169-04	Sample 4	Liquid	10/29/2013
1317169-05	Sample 5	Liquid	10/29/2013

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

LABORATORY REPORT

Client
NORA
1000 Corporate Centre Drive Suite 250
Franklin, TN 37067

Order Number
1317169

Project Number
NORA Samples

Issued
Tuesday, November 12, 2013

Total Number of Pages
10 (excluding C.O.C. and cooler receipt form)

Approved By: [signature]
QA Manager

1317169

Certifications: A2LA/DOD 0724.01, Alabama 41600, Arkansas 88-0735, California 07256CA, Colorado, Connecticut PH-0105, Delaware, Florida NELAC E87688, Georgia E87688 and 943, Idaho OH00923, Illinois 200061 and Reg.5, Indiana C-OH-13, Kansas E-10347, Kentucky (underground Storage Tank) 3, Kentucky 90146, Louisiana 04061 and LA12004, Maine 2012015, Maryland 339, Massachusetts M-OPH923, Michigan (Reg.5), Minnesota 409711, Montana CERT0099, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, Ohio 4170, Ohio VAP CL0052, Oklahoma 9940, Oregon OH200001, Pennsylvania 68-01335, Rhode Island LA000317, South Carolina 92016001, Tennessee TN04018, Texas T104704466-11-5, Region 5 WG-15J, Region 8 8TMS-L, USDA/APHIS P330-11-00244, Utah OH009232011-1, Vermont VT-87688, Virginia 00440 and 1581, Washington C891, West Virginia 248 and 9957C and E87688, Wisconsin 399013010

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Volatiles

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	1,1-Dichloroethene	0.1	<0.1	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	1,2-Dichloroethane	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	2-Butanone (MEK)	2	<2.0	mg/L	L	1311	1	200	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Benzene	0.1	0.33	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Carbon Tetrachloride	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Chlorobenzene	0.1	<0.1	mg/L	L	1311	1	100	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Chloroform	0.1	<0.1	mg/L	L	1311	1	6	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Tetrachloroethene	0.1	0.83	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Trichloroethene	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 1	1317169-01	29-Oct-13	Vinyl Chloride	0.2	<0.2	mg/L	L	1311	1	0.2	01-Nov-13	MS

TCLP BNA

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	1,4-Dichlorobenzene	2	ND	mg/L	L	1311	1	7.5	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	2,4,5-Trichlorophenol	2	ND	mg/L	L	1311	1	400	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	2,4,6-Trichlorophenol	2	ND	mg/L	L	1311	1	2	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	2,4-Dinitrotoluene	2	ND	mg/L	L	1311	1	0.13	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Cresols	2	ND	mg/L	L	1311	1	200	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Hexachloro-1,3-butadiene	2	ND	mg/L	L	1311	1	0.5	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Hexachlorobenzene	2	ND	mg/L	L	1311	1	0.13	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Hexachloroethane	2	ND	mg/L	L	1311	1	3	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Nitrobenzene	2	ND	mg/L	L	1311	1	2	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Pentachlorophenol	2	ND	mg/L	L	1311	1	100	02-Nov-13	AE
Sample 1	1317169-01	29-Oct-13	Pyridine	2	ND	mg/L	L	1311	1	5	02-Nov-13	AE

TCLP Arsenic

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Arsenic	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Barium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Barium	5	ND	mg/L	L	1311	1	100	11-Nov-13	VVK

TCLP Cadmium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Cadmium	0.1	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Chromium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Chromium	0.2	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Lead

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Lead	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 · Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Report Narrative

Client: NORA

Order Number: 1317169

No problems were encountered during analysis of this order number, except as noted.

Method numbers, unless specified as SM or ASTM, are EPA methods.

Method of analysis for TCLP Volatiles is 1311/8260B
Method of analysis for TCLP Metals is 1311/6010B and 1311/7471A
Method of analysis for TCLP BNA is 1311/8270C

Data Qualifiers:
B = Analyte found in the method blank
J = Estimated concentration of analyte between MDL (LOD) and Reporting Limit (LOQ)
C = Analyte has been confirmed by another instrument or method
E = Analyte exceeds the upper limit of the calibration curve.
D = Sample or extract was analyzed at a higher dilution
X = User defined data qualifier.
S = Surrogate out of control limits
U = Undetected
a = Not Accredited by NELAC

ND = Non Detected at LOQ
DF = Dilution Factor

Limit Of Quantitation (LOQ) = Laboratory Reporting Limit (not adjusted for dilution factor)
Limit Of Detection (LOD) = Method Detection Limit
Practical Quantitation Limit (PQL) = (same as LOQ)
Method Detection Limit (MDL) = (same as LOD)
Reporting Detection Limit (RDL) = (same as LOD)

Matrices:
A = Air
C = Cream
DW = Drinking Water
L = Liquid
O = Oil
SL = Sludge
SO = Soil
S = Solid
T = Tablet
TC = TCLP Extract
WW = Waste Water
W = Wipe

Estimated uncertainty values are available upon request.

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 · Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Cadmium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Cadmium	0.1	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Chromium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Chromium	0.2	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Lead

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Lead	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Mercury

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Mercury	0.002	ND	mg/L	L	1311	1	0.2	01-Nov-13	ALJ

TCLP Se

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Selenium	0.5	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Silver

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Silver	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Volatiles

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	1,1-Dichloroethene	0.1	<0.1	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	1,2-Dichloroethane	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	2-Butanone (MEK)	2	<2.0	mg/L	L	1311	1	200	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Benzene	0.1	0.38	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Carbon Tetrachloride	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Chlorobenzene	0.1	<0.1	mg/L	L	1311	1	100	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Chloroform	0.1	<0.1	mg/L	L	1311	1	6	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Tetrachloroethene	0.1	0.65	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Trichloroethene	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 3	1317169-03	29-Oct-13	Vinyl Chloride	0.2	<0.2	mg/L	L	1311	1	0.2	01-Nov-13	MS

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Mercury

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Mercury	0.002	ND	mg/L	L	1311	1	0.2	01-Nov-13	ALJ

TCLP Se

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Selenium	0.5	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Silver

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 1	1317169-01	29-Oct-13	TCLP Silver	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Volatiles

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	1,1-Dichloroethene	0.1	<0.1	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	1,2-Dichloroethane	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	2-Butanone (MEK)	2	<2.0	mg/L	L	1311	1	200	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Benzene	0.1	0.27	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Carbon Tetrachloride	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Chlorobenzene	0.1	<0.1	mg/L	L	1311	1	100	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Chloroform	0.1	<0.1	mg/L	L	1311	1	6	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Tetrachloroethene	0.1	0.47	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Trichloroethene	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 2	1317169-02	29-Oct-13	Vinyl Chloride	0.2	<0.2	mg/L	L	1311	1	0.2	01-Nov-13	MS

TCLP BNA

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	1,4-Dichlorobenzene	2	ND	mg/L	L	1311	140	7.5	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	2,4,5-Trichlorophenol	2	ND	mg/L	L	1311	140	400	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	2,4,6-Trichlorophenol	2	ND	mg/L	L	1311	140	2	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	2,4-Dinitrotoluene	2	ND	mg/L	L	1311	140	0.13	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Cresols	2	ND	mg/L	L	1311	140	200	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Hexachloro-1,3-butadiene	2	ND	mg/L	L	1311	140	0.5	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Hexachlorobenzene	2	ND	mg/L	L	1311	140	0.13	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Hexachloroethane	2	ND	mg/L	L	1311	140	3	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Nitrobenzene	2	ND	mg/L	L	1311	140	2	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Pentachlorophenol	2	ND	mg/L	L	1311	140	100	02-Nov-13	AE
Sample 2	1317169-02	29-Oct-13	Pyridine	2	ND	mg/L	L	1311	140	5	02-Nov-13	AE

TCLP Arsenic

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Arsenic	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Barium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 2	1317169-02	29-Oct-13	TCLP Barium	5	ND	mg/L	L	1311	1	100	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Volatiles

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	1,1-Dichloroethene	0.1	<0.1	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	1,2-Dichloroethane	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	2-Butanone (MEK)	2	<2.0	mg/L	L	1311	1	200	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Benzene	0.1	0.53	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Carbon Tetrachloride	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Chlorobenzene	0.1	<0.1	mg/L	L	1311	1	100	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Chloroform	0.1	<0.1	mg/L	L	1311	1	6	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Tetrachloroethene	0.1	0.84	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Trichloroethene	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 4	1317169-04	29-Oct-13	Vinyl Chloride	0.2	<0.2	mg/L	L	1311	1	0.2	01-Nov-13	MS

TCLP BNA

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	1,4-Dichlorobenzene	1.2	ND	mg/L	L	1311	100	7.5	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	2,4,5-Trichlorophenol	1.2	ND	mg/L	L	1311	100	400	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	2,4,6-Trichlorophenol	1.2	ND	mg/L	L	1311	100	2	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	2,4-Dinitrotoluene	1.2	ND	mg/L	L	1311	100	0.13	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Cresols	1.2	ND	mg/L	L	1311	100	200	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Hexachloro-1,3-butadiene	1.2	ND	mg/L	L	1311	100	0.5	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Hexachlorobenzene	1.2	ND	mg/L	L	1311	100	0.13	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Hexachloroethane	1.2	ND	mg/L	L	1311	100	3	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Nitrobenzene	1.2	ND	mg/L	L	1311	100	2	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Pentachlorophenol	1.2	ND	mg/L	L	1311	100	100	02-Nov-13	AE
Sample 4	1317169-04	29-Oct-13	Pyridine	1.2	ND	mg/L	L	1311	100	5	02-Nov-13	AE

TCLP Arsenic

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Arsenic	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Barium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Barium	5	ND	mg/L	L	1311	1	100	11-Nov-13	VVK

TCLP Cadmium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Cadmium	0.1	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Chromium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Chromium	0.2	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Lead

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Lead	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP BNA

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	1,4-Dichlorobenzene	2	ND	mg/L	L	1311	140	7.5	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	2,4,5-Trichlorophenol	2	ND	mg/L	L	1311	140	400	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	2,4,6-Trichlorophenol	2	ND	mg/L	L	1311	140	2	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	2,4-Dinitrotoluene	2	ND	mg/L	L	1311	140	0.13	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Cresols	2	ND	mg/L	L	1311	140	200	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Hexachloro-1,3-butadiene	2	ND	mg/L	L	1311	140	0.5	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Hexachlorobenzene	2	ND	mg/L	L	1311	140	0.13	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Hexachloroethane	2	ND	mg/L	L	1311	140	3	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Nitrobenzene	2	ND	mg/L	L	1311	140	2	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Pentachlorophenol	2	ND	mg/L	L	1311	140	100	02-Nov-13	AE
Sample 3	1317169-03	29-Oct-13	Pyridine	2	ND	mg/L	L	1311	140	5	02-Nov-13	AE

TCLP Arsenic

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Arsenic	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Barium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Barium	5	ND	mg/L	L	1311	1	100	11-Nov-13	VVK

TCLP Cadmium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Cadmium	0.1	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Chromium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Chromium	0.2	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Lead

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Lead	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Mercury

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Mercury	0.002	ND	mg/L	L	1311	1	0.2	01-Nov-13	ALJ

TCLP Se

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Selenium	0.5	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Silver

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 3	1317169-03	29-Oct-13	TCLP Silver	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Cadmium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Cadmium	0.1	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Chromium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Chromium	0.2	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Lead

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Lead	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Mercury

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Mercury	0.002	ND	mg/L	L	1311	1	0.2	01-Nov-13	ALJ

TCLP Se

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Selenium	0.5	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Silver

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Silver	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

November 12, 2013
Client: NORA
Address: 1000 Corporate Centre Drive Suite 250
Franklin, TN 37067
Received: 10/30/2013
Project #: NORA Samples

TCLP Mercury

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Mercury	0.002	ND	mg/L	L	1311	1	0.2	01-Nov-13	ALJ

TCLP Se

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Selenium	0.5	ND	mg/L	L	1311	1	1	11-Nov-13	VVK

TCLP Silver

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 4	1317169-04	29-Oct-13	TCLP Silver	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Volatiles

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	1,1-Dichloroethene	0.1	<0.1	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	1,2-Dichloroethane	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	2-Butanone (MEK)	2	<2.0	mg/L	L	1311	1	200	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Benzene	0.1	0.27	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Carbon Tetrachloride	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Chlorobenzene	0.1	<0.1	mg/L	L	1311	1	100	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Chloroform	0.1	<0.1	mg/L	L	1311	1	6	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Tetrachloroethene	0.1	0.53	mg/L	L	1311	1	0.7	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Trichloroethene	0.1	<0.1	mg/L	L	1311	1	0.5	01-Nov-13	MS
Sample 5	1317169-05	29-Oct-13	Vinyl Chloride	0.2	<0.2	mg/L	L	1311	1	0.2	01-Nov-13	MS

TCLP BNA

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	1,4-Dichlorobenzene	3.6	ND	mg/L	L	1311	130	7.5	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	2,4,5-Trichlorophenol	3.6	ND	mg/L	L	1311	130	400	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	2,4,6-Trichlorophenol	3.6	ND	mg/L	L	1311	130	2	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	2,4-Dinitrotoluene	3.6	ND	mg/L	L	1311	130	0.13	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Cresols	3.6	ND	mg/L	L	1311	130	200	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Hexachloro-1,3-butadiene	3.6	ND	mg/L	L	1311	130	0.5	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Hexachlorobenzene	3.6	ND	mg/L	L	1311	130	0.13	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Hexachloroethane	3.6	ND	mg/L	L	1311	130	3	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Nitrobenzene	3.6	ND	mg/L	L	1311	130	2	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Pentachlorophenol	3.6	ND	mg/L	L	1311	130	100	02-Nov-13	AE
Sample 5	1317169-05	29-Oct-13	Pyridine	3.6	ND	mg/L	L	1311	130	5	02-Nov-13	AE

TCLP Arsenic

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Arsenic	0.5	ND	mg/L	L	1311	1	5	11-Nov-13	VVK

TCLP Barium

Client ID#	Lab ID#	Collected	Analyte	Rep Lmt	Result	Units	Matrix	Method	DF	RegLvl	Run	Analys
Sample 5	1317169-05	29-Oct-13	TCLP Barium	5	ND	mg/L	L	1311	1	100	11-Nov-13	VVK

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com