UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE
NOW THE
OFFICE OF LAND AND
EMERGENCY MANAGEMENT

NOV 08 2016

Mr. James Ventura
President
VMS Environmental Development, LLC
21686 East Lincoln Highway, Suite E
Lynwood, Illinois 60411

Dear Mr. Ventura:

In your letter of February 27, 2013, you requested clarification from the U.S. Environmental Protection Agency (EPA) that your engineered fuel processed from municipal solid waste, called Biomass Derived Fuel (BDF), is a non-waste fuel product under the 40 CFR Part 241 Non-Hazardous Secondary Materials (NHSM) rule. In your letter, and follow-up email correspondence from Dr. Fred Jones of VMS, information was provided regarding the BDF process, as well as information regarding the VMS position that BDF should be considered a non-waste fuel in accordance with 40 CFR 241.3(b)(4).

To be designated as a non-waste fuel under that section, the regulations require that the processing of the NHSM meet the definition of processing in 40 CFR 241.2, and the legitimacy criteria for fuels in 40 CFR 241.3(d)(1) after processing. Units that combust NHSM as fuels that do not meet these requirements must meet applicable emissions standards issued under section 129 of the Clean Air Act.

Based on the information provided in your September 2013 letter and supplemental materials, we agree that BDF would be considered a non-waste fuel under the 40 CFR Part 241 regulations provided specifications outlined in your submittal are maintained including a moisture content of 2% or less (verified by daily composite sampling); and an ash content of 25% or less (on a dry basis verified by daily composite sampling). In addition, to be considered a non-waste, the BDF must be combusted in a unit designed to burn coal, and BDF use cannot exceed 30% of the coal fuel required to operate the combustion unit. The remainder of this letter provides the basis for our position including the reasons for these conditions.[1] *If these conditions are not maintained, the agency may reach a different conclusion.*

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[1] Note that a non-waste determination under 40 CFR Part 241 does not affect a state's authority to regulate a nonhazardous secondary material as a solid waste. Non-hazardous secondary materials may be regulated simultaneously as a solid waste by the state, but as a non-waste fuel under 40 CFR Part 241 for the purposes of determining the applicable emissions standards under the Clean Air Act for the combustion unit in which it is used.

A. Processing

Processing is defined in 40 CFR 241.2 as operations that transform discarded NHSM into a non-waste fuel or non-waste ingredient, including operations necessary to: remove or destroy contaminants; significantly improve the fuel characteristics (e.g., sizing or drying of the material, in combination with other operations); chemically improve the as-fired energy content; or improve the ingredient characteristics. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for the purposes of the definition.

The determination of whether a particular operation or set of operations constitutes sufficient processing to meet the definition in 40 CFR 241.2 is necessarily a case-specific and fact-specific determination. This determination applies the regulatory definition of processing to the specific discarded material(s) being processed, as described in prior agency correspondence and supporting materials,[2] taking into account the nature and content of the material, as well as the types and extent of the operations performed on it. Thus, the same operations may or may not constitute sufficient processing under the regulation in a particular circumstance, depending on the material being processed and the specific details of the processing. In some cases, certain operations will be sufficient to "transform discarded non-hazardous secondary material into a non-waste fuel," and in other cases, the same operations may not be sufficient to do so.

As described in the materials that VMS submitted, production of the granular BDF involves multiple steps to process and upgrade discarded household and commercial waste (municipal solid waste). The processing steps are summarized below.

Preliminary sorting and physical separation: Preliminary processing includes physical separation using trommel and disc screening, ferrous, nonferrous, and air classification separation steps. The proposed Low Temperature Mechanical Pyrolysis (LTMP) plant will include four rotary trommel screens with multiple sized screen sections to size-sort the material. Two disc screens will be used to enhance recovery of organic matter. Seven magnetic separators will be used to remove and recover ferrous metals and three eddy-current separators will be used to remove and recover aluminum and other non-ferrous metals. Three air classification separators will be used to remove inorganic matter such as glass, sand, stones, etc. Estimates of recycling and removal performance of this preliminary stage were provided: 85% recovery of organic matter for further processing into BDF; 85% recovery of ferrous metals; 50% recovery of aluminum and other non-ferrous metals; 80% removal of glass; 70% removal of undesired inorganic matter.

Low Temperature Mechanical Pyrolysis (LTMP) Process: The material remaining after the preliminary processing step is directed to the LTMP process for chemical upgrading. This system is derived from plastics recycling technology. Mechanical mixing and viscous shear supply the energy to allow the reactor to operate at 550 degrees Fahrenheit.[3] Three mixing zones are used to dry the material, drive the

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[2] https://www.epa.gov/rcra/identification-non-hazardous-secondary-materials-are-solid-waste#Implementation

[3] Background materials state that 550 degrees Fahrenheit is different from other gasification/pyrolysis types of processes since it both allows operation at a lower temperature which increases the overall efficiency of their process, and it falls below the dioxin formation temperature window, generally assumed to be around 700-750 degrees F.

pyrolysis reaction and mix the material to create a homogeneous product. No air, oxygen or other reactants are added to the process and no flame or external heating element is used.

Several test results were provided by VMS to demonstrate that the LTMP process significantly upgrades the material's fuel characteristics following the preliminary sorting and physical separation processing step including lower moisture content and a larger elemental carbon content which improves the combustion efficiency of BDF. Research information was also provided in the February 27, 2013 submission to EPA concluding that the LTMP process results in the removal of chlorinated hydrocarbons and PAHs to non-detectable levels.

Based on this description and evaluation of the processing, we agree with the VMS finding that BDF operations meet the definition of processing in 40 CFR 241.2. This determination relies first on the prevention/removal of contaminants which is achieved by the preliminary physical processing designed to remove metals and inorganic materials. Research studies presented by VMS indicate that the LTMP destroys chlorinated hydrocarbons and PAHs further removing contaminants and capturing residual chlorine and sulfur as soluble alkali salts making them less available during later combustion. Second, our conclusion relies on the improvement of the fuel characteristics which is achieved by the LTMP process to reduce moisture content, break down organic molecules and concentrate the remaining carbon, producing a dry, granular, homogeneous fuel product that looks similar to coal. And third, we agree that the chemical improvement to the as-fired energy content achieved by the LTMP by upgrading the chemical composition of the BDF after the preliminary processing.

In addition, as discussed in VMS submittals, the waste that is processed is transformed into a product fuel that is largely homogenous. The BDF can maintain a moisture content of 2% or less (low moisture further improves the fuel characteristics of the material), and an ash content of 25% or less (on a dry basis). In consideration of the nature of the feedstock used to generate BDF including presence of chlorinated plastics (BDF contains chlorine levels of 4,264 ppm as shown in Table 1A), the BDF must be combusted in a unit designed to burn coal, and the BDF input is limited to 30% of the coal fuel required to operate the combustion unit. Due to the sulfur content of the coal, this BDF limit will help decrease the potential formation of chlorinated organic compounds, particularly polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) during combustion.

B. Legitimacy Criteria

Under 40 CFR 241.3(d)(1), the legitimacy criteria for fuels includes: 1) management of the material as valuable commodity based on the following factors - storage prior to use must not exceed reasonable time frames and management of the material must be in a manner consistent with an analogous fuel, or where there is no analogous fuel, adequately contained to prevent releases to the environment; 2) the material must have meaningful heating value and be used as fuel in a combustion unit that recovers energy; and 3) the material must contain contaminants at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn.

Manage as a Valuable Commodity

The VMS submittal indicates that BDF would be purchased by utilities and industrial customers as a direct replacement for coal. Based on the information provided, BDF will be managed in the same way that coal is managed. BDF will be produced and immediately delivered to utility plants to be commingled with their existing coal stockpiles. Storage times and procedures will be analogous to that of coal. Therefore, BDF meets this criterion.

Meaningful Heating Value and Used As A Fuel to Recovery Energy

The heating value of BDF is presented as 10,556 Btu/lb which is in the range of coals being burned by utilities. As the Agency states in the preamble to the NHSM rule, NHSM with an energy value greater than 5,000 Btu/pound are considered to have meaningful heating value (see 76 FR15541, March 21, 2011). Thus, we believe the BDF meets the second legitimacy criterion.

Comparability of Contaminant Levels

The third legitimacy criterion states that the NHSM must contain contaminants at levels comparable in concentration to or lower than traditional fuels which the combustion unit is designed to burn. The term contaminants is defined in 40 CFR 241.2 as constituents in the NHSM that will result in emissions of air pollutants under Clean Air Act section 112(b) or the nine pollutants listed under Clean Air Act section 129, including those constituents that could generate products of incomplete combustion.

Information and several charts were provided in your February 27, 2013 submission to establish that BDF contaminant concentrations were all within range of levels found in coal. In addition, VMS submitted specific contaminant concentration levels to the EPA via emails on May 17, 2013 and June 7, 2013. VMS compared multiple samples showing BDF contaminant concentrations to maximum contaminant data in coal in the May 2013 emails, and provided a number of references and sources for the coal data.

A direct contaminant-to-contaminant comparison was made by the EPA using the BDF concentration data and coal data in EPA's November 29, 2011 document, *Contaminant Concentrations in Traditional Fuels: Tables for Comparison*. These comparisons are found in Tables 1A and 1B. All contaminants, except for antimony, are within the range of coal using EPA's comparison tables. To address antimony, VMS analyzed it as part of a group of contaminants in your attachment to the October 25th email. Antimony is a low volatile metal along with arsenic, beryllium, chromium, cobalt, manganese, and nickel.

The EPA previously stated that for the purposes of contaminant comparisons, it could be appropriate to group contaminants sharing physical and chemical properties that influence behavior in the combustion unit prior to the point where emissions occur. Although the agency did not include low-volatile metal or halogen groups in its sample approach, persons were advised that they may consider other groupings they can show are technically reasonable.[4]

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[4] See 78 FR 9146.

Based on the information provided by VMS, we agree that in your specific situation grouping low-volatile metals is reasonable.[5,6] The Agency notes that for the two known human carcinogens in the low-volatile metals group – arsenic and chromium – BDF contains arsenic and chromium levels that are comparable to and within the range of coal. Table 2 provides grouping data for a comparison of low volatile metals, including antimony. The data show that the total present in BDF is within the range found in coal.

The determination that the contaminants in BDF are comparable to or less than those in coal assumes that BDF was tested for any contaminant expected to be present. Additional contaminants for which BDF was not tested must be present at levels comparable to or less than those the appropriate traditional fuel, based on your knowledge.

Conclusion

Based on the information provided in your February 2013 letter and supplemental information VMS provided, we agree with your finding that BDF would be considered a non-waste fuel under the 40 CFR Part 241 regulations provided specifications outlined in your submittal are maintained including a moisture content of 2% or less (verified by daily composite sampling) and an ash content of 25% or less (on a dry basis verified by daily composite sampling). In addition, to be considered a non-waste, the BDF must be combusted in a unit designed to burn coal, and BDF use cannot exceed 30% of the coal fuel required to operate the combustion unit. As noted above, in consideration of the nature of the feedstock used to generate BDF including the presence of chlorinated plastics (resulting in chlorine levels of 4264 ppm as shown in (Table 1A), the BDF must be combusted in a unit designed to burn coal. The BDF input is limited to 30% of the coal fuel required to operate the combustion unit, thus helping decrease the potential formation of chlorinated organic compounds, particularly polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) during combustion.

Since our assessment is based on information you provided showing that BDF meets certain specifications/conditions, our conclusion is based on the maintenance of the specifications/conditions in the BDF product. The specifications/conditions will ensure the consistency and homogeneity of the fuel product and that it will not contain waste materials for combustion, including contaminant levels that exceed those comparable to those typically found in traditional fuels.

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[5] While the agency does not consider the grouping of total metals to be appropriate, it may consider a group of low-volatile metals to be appropriate for combustion units and operating conditions that lead those metals to concentrate in the bottom ash during combustion. See 78 FR 9147

[6] This interpretation is restricted to this specific situation. This restriction prevents inclusion of a low-volatile metals group that may have significantly higher levels of known human carcinogens balanced by other low-volatile metals that are not human carcinogens. In this case, arsenic and chromium levels (known human carcinogens) are at or below the median concentration observed in coal.

If you have any questions regarding processing and legitimacy criteria, please contact George Faison at (703) 305-7652. For questions regarding the specifications outlined above, please contact David Cozzie at (919) 541-5356.

Sincerely,

Lois Elliott

for Betsy Devlin, Director,
Material Recovery and Waste Management Division
Office of Resource Conservation and Recovery

cc: Dr. Fred Jones

Table 1A: Contaminant-by Contaminant Comparison, Elemental Contaminants

Contaminant	Units[a]	VMS Biomass Derived Fuel (BDF)[b]	Coal Range[c]	Result of Comparison to Specifications and to Analytical Test Results
Metal elements – dry basis				
Antimony (Sb)	ppm	60	ND – 10	Not comparable to coal
Arsenic (As)	ppm	24	ND – 174	Within the range of coal
Beryllium (Be)	ppm	0.44	ND – 206	Within the range of coal
Cadmium (Cd)	ppm	1.9	ND – 19	Within the range of coal
Chromium (Cr)	ppm	72.9	ND – 168	Within the range of coal
Cobalt (Co)	ppm	4	ND – 30	Within the range of coal
Lead (Pb)	ppm	31.2	ND – 148	Within the range of coal
Manganese (Mn)	ppm	48	ND – 512	Within the range of coal
Mercury (Hg)	ppm	0.04	ND – 3.1	Within the range of coal
Nickel (Ni)	ppm	83	ND – 730	Within the range of coal
Selenium (Se)	ppm	1	ND – 74.3	Within the range of coal
Non-metal elements – dry basis				
Chlorine (Cl)	ppm	4,264	ND – 9,080	Within the range of coal
Fluorine (F)	ppm	85	ND – 178	Within the range of coal
Nitrogen (N)	ppm	10,800	13,600 – 54,000	Within the range of coal
Sulfur (S)	ppm	2,400	740 – 61,300	Within the range of coal

Notes:

a. All contaminant analyses—BDF and coal—are on a dry basis.

b. Contaminant data from June 7th 2013 email from Fred Jones, VMS Environmental Development LLC to Susan Mooney, US EPA Region 5.

c. Coal data taken from EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011,* available at www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison. Refer to that document for the footnotes and sources of the data.

Table 1B: Contaminant-by-Contaminant Comparison, HAP Compounds

Contaminant	Units[a]	VMS Biomass Derived Fuel (BDF)[b, f]	Coal Range[c]	Result of Comparison to Specifications and to Analytical Test Results
Volatile Organic Compounds (VOC)				
Ethyl benzene	ppm	<0.005	0.7 – 5.4	Lower than coal
Methylene chloride	ppm	<0.005	No Data	
Styrene	ppm	<0.005	26	Lower than coal
Tetrachloroethylene	ppm	<0.005	No Data	
Toluene	ppm	<0.005	8.6 – 56	Lower than coal
Xylenes	ppm	<0.005	4.0 – 28	Lower than coal
32 Other VOCs[d]	ppm	<0.005 – <0.1	ND – 38	Lower than coal
Semi-Volatile Organic Compounds (SVOC)				
Bis(2-ethylhexyl)phthalate (DEHP)	ppm	<0.66	No Data	
69 Other SVOCs[e]	ppm	<0.66 – 3.3	No Data	

Notes:

a. All contaminant analyses—BDF and coal—are on a dry basis.

b. Contaminant data from June 7th 2013 email from Fred Jones, VMS Environmental Development LLC to Susan Mooney, US EPA Region 5

c. Coal data taken from EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011*, available at: www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison. Refer to that document for the footnotes and sources of the data.

d. From VMS November 2013 submittal with a list of the VOCs and SVOCs that were not detected in BDF – included as Attachment A. Method detection limits (MDLs) for individual analytes varied from 5 µg/Kg to 100 µg/Kg.

e. From VMS November 2013 submittal with a list of the VOCs and SVOCs that were not detected in BDF – included as Attachment A. MDLs data from December ranged from individual analytes varied from 660 µg/kg to 3,300 µg/kg (ppb).

f. Detection limit (MDL) varies by individual analyte, so range of reported MDLs are reported for aggregate analyte cells.

Table 2: Contaminant Comparison, Low-Volatile Metals Group (LVM)

Metal[a]	Units	VMS Biomass Derived Fuel (BDF)[b]	Coal[c]
Antimony (Sb)	ppm	60	ND – 10
Arsenic (As)	ppm	24	ND – 174
Beryllium (Be)	ppm	0.44	ND – 206
Chromium (Cr)	ppm	72.9	ND – 168
Cobalt (Co)	ppm	4	ND – 30
Manganese (Mn)	ppm	48	ND – 512
Nickel (Ni)	ppm	83	ND – 730
Total LVM[d]	**ppm**	**292.3**	**ND – 767**

a. Low-volatile metals identified by VMS, citing 40 CFR 63.1219(e)(4) – National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors.

b. Contaminant data from June 7th 2013 email from Fred Jones, VMS Environmental Development LLC to Susan Mooney, US EPA Region 5.

c. Coal data taken from EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011*, available at: www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison. Refer to that document for the footnotes and sources of the data.

d. The high and low ends of each individual metal's range do not necessarily add up to the total LVM range. This is because maximum and minimum concentrations for individual metals do not always come from the same sample.

Attachment A

HAPs ANALYSIS OF BDF

Semi-volatile Analysis (EPA Method 8270)

Base Neutral Fraction	Sample 1	Sample 2	MDL
Acenaphthene	BDL*	BDL*	<660 ug/Kg
Acenaphthylene	BDL	BDL	<660 ug/Kg
Anthracene	BDL	BDL	<660 ug/Kg
Benzidine	BDL	BDL	<660 ug/Kg
Benzo (a) anthracene	BDL	BDL	<660 ug/Kg
Benzo (b) anthracene	BDL	BDL	<660 ug/Kg
Benzo (k) anthracene	BDL	BDL	<660 ug/Kg
Benzoic Acid	BDL	BDL	<3300 ug/Kg
Benzo (a) pyrene	BDL	BDL	<660 ug/Kg
3,4-Benzofluoranthene	BDL	BDL	<660 ug/Kg
Benzo (ghi) perylene	BDL	BDL	<660 ug/Kg
Benzo (k) fluoranthene	BDL	BDL	<660 ug/Kg
Benzyl Alcohol	BDL	BDL	<1300 ug/Kg
Bis (2-chloroethyl) ether	BDL	BDL	<660 ug/Kg
Bis (2-chloroethoxy) methan	BDL	BDL	<660 ug/Kg
Bis (2-ethylhexyl) phthalate	BDL	BDL	<660 ug/Kg
Bis (2-chloroisopropyl) ethe	BDL	BDL	<660 ug/Kg
4-Bromophenyl phenyl ethe	BDL	BDL	<660 ug/Kg
Butyl benzyl phthalate	BDL	BDL	<660 ug/Kg
4-Chloroanaline	BDL	BDL	<1300 ug/Kg
2-Chloronaphthalene	BDL	BDL	<660 ug/Kg
4-Chlorophenyl phenyl ethe	BDL	BDL	<660 ug/Kg
Chrysene	BDL	BDL	<660 ug/Kg
Dibenzo (a,h) anthracene	BDL	BDL	<660 ug/Kg
Dibenzofuran	BDL	BDL	<660 ug/Kg
Di-n-butylphthalate	BDL	BDL	<660 ug/Kg
1,2-Dichlorobenzene	BDL	BDL	<660 ug/Kg
1,3-Dichlorobenzene	BDL	BDL	<660 ug/Kg
1,4-Dichlorobenzene	BDL	BDL	<660 ug/Kg
3,3'-Dichlorobenzene	BDL	BDL	<3300 ug/Kg
Diethyl phthalate	BDL	BDL	<660 ug/Kg
Dimethyl phthalate	BDL	BDL	<660 ug/Kg
2,4-Dinitrotoluene	BDL	BDL	<660 ug/Kg
2,6-Dinitrotoluene	BDL	BDL	<660 ug/Kg
Di-n-octylphthalate	BDL	BDL	<660 ug/Kg
1,2-Diphenylhydrazine	BDL	BDL	<660 ug/Kg
Fluoranthene	BDL	BDL	<660 ug/Kg
Fluorene	BDL	BDL	<660 ug/Kg
Hexachlorobenzene	BDL	BDL	<660 ug/Kg
Hexachlorobutadiene	BDL	BDL	<660 ug/Kg
Hexachlorocyclopentadiene	BDL	BDL	<660 ug/Kg
Hexachloroethane	BDL	BDL	<660 ug/Kg
Indeno (1,2,3-cd) pyrene	BDL	BDL	<660 ug/Kg
Isophorone	BDL	BDL	<660 ug/Kg
2-Methylnaphthalene	BDL	BDL	<660 ug/Kg
Napthalene	BDL	BDL	<660 ug/Kg
2-Nitroanaline	BDL	BDL	<3300 ug/Kg
3-Nitroanaline	BDL	BDL	<3300 ug/Kg
4-Nitroanaline	BDL	BDL	<3300 ug/Kg
Nitrobenzene	BDL	BDL	<660 ug/Kg
N-nitrosodimethylamine	BDL	BDL	<660 ug/Kg
N-nitrosodiphenylamine	BDL	BDL	<660 ug/Kg
N-Nitrosodi-n-propylamine	BDL	BDL	<660 ug/Kg
Phenantherene	BDL	BDL	<660 ug/Kg
Pyrene	BDL	BDL	<660 ug/Kg

HAPs ANALYSIS OF BDF

Semi-volatile Analysis (EPA Method 8270)

Acid Fraction	Sample 1	Sample 2	MDL
4-Chloro-3-methylphenol	BDL*	BDL*	<1300 ug/Kg
2-Chlorophenol	BDL	BDL	<660 ug/Kg
2,4-Dichlorophenol	BDL	BDL	<660 ug/Kg
2,4-Dimethylphenol	BDL	BDL	<660 ug/Kg
2,4-Dinitrophenol	BDL	BDL	<3300 ug/Kg
2-Methyl-4,6-dinitrophenol	BDL	BDL	<3300 ug/Kg
2-Methylphenol	BDL	BDL	<660 ug/Kg
4-Methylphenol	BDL	BDL	<660 ug/Kg
2-Nitrophenol	BDL	BDL	<660 ug/Kg
4-Nitrophenol	BDL	BDL	<3300 ug/Kg
Pentachlorophenol	BDL	BDL	<3300 ug/Kg
Phenol	BDL	BDL	<660 ug/Kg
2,4,5-Trichlorophenol	BDL	BDL	<660 ug/Kg
2,4,6-Trichlorophenol	BDL	BDL	<660 ug/Kg

Volatile Organic Analysis (EPA Method 8240)

	Sample 1	Sample 2	MDL
Acetone	BDL*	BDL*	<100 ug/Kg
Acroline	BDL	BDL	<5 ug/Kg
Acrylonitrile	BDL	BDL	<5 ug/Kg
Benzene	BDL	BDL	<5 ug/Kg
Bromodichloromethane	BDL	BDL	<5 ug/Kg
Bromoform	BDL	BDL	<5 ug/Kg
Bromomethane	BDL	BDL	<10 ug/Kg
2-Butanone (MEK)	BDL	BDL	<100 ug/Kg
Carbon disulfide	BDL	BDL	<5 ug/Kg
Carbon Tetrachloride	BDL	BDL	<5 ug/Kg
Chlorobenzene	BDL	BDL	<5 ug/Kg
Chloroethane	BDL	BDL	<10 ug/Kg
2-Chloroethylvinyl ether	BDL	BDL	<10 ug/Kg
Chloroform	BDL	BDL	<5 ug/Kg
Chloromethane	BDL	BDL	<10 ug/Kg
Dibromochloromethane	BDL	BDL	<5 ug/Kg
1,1-Dichloroethane	BDL	BDL	<5 ug/Kg
1,2-Dichloroethane	BDL	BDL	<5 ug/Kg
1,2-Dichloroethene	BDL	BDL	<5 ug/Kg
trans-1,2-Dichloroethene	BDL	BDL	<5 ug/Kg
1,2-Dichloropropane	BDL	BDL	<5 ug/Kg
cis-1,3-Dichloropropene	BDL	BDL	<5 ug/Kg
trans-1,3-Dichloropropene	BDL	BDL	<5 ug/Kg
Ethyl Benzene	BDL	BDL	<5 ug/Kg
2-Hexanone	BDL	BDL	<50 ug/Kg
Methylene Chloride	BDL	BDL	<5 ug/Kg
4-Methyl-2-Pentanone	BDL	BDL	<50 ug/Kg
Styrene	BDL	BDL	<5 ug/Kg
1,1,2,2-Tetrachloroethane	BDL	BDL	<5 ug/Kg
Tetrachloroethylene	BDL	BDL	<5 ug/Kg
Toluene	BDL	BDL	<5 ug/Kg
1,1,1-Trichloroethane	BDL	BDL	<5 ug/Kg
1,1,2-Trichloroethane	BDL	BDL	<5 ug/Kg
Trichloroethylene	BDL	BDL	<5 ug/Kg
Trichlorofluoromethane	BDL	BDL	<5 ug/Kg
Xylenes	BDL	BDL	<5 ug/Kg
Vinyl Acetate	BDL	BDL	<50 ug/Kg
Vinyl Chloride	BDL	BDL	<10 ug/Kg