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

OFFICE OF
LAND AND EMERGENCY
MANAGEMENT

November 12, 2020

Jim Anderson
Environmental Engineer
GCC Dacotah, Inc.
501 North Saint Onge St.
Rapid City, SD 57702

Dear Mr. Anderson:

GCC Dacotah, Inc. (GCC) submitted a request to U.S. Environmental Protection Agency (EPA) Region 8 in June 2019 to evaluate its non-hazardous secondary materials (NHSM) self-determination, as presented in their April 15, 2019 Title V permit application. In a letter dated April 6, 2020, GCC submitted additional information and requested confirmation that the auto shredder residue (ASR) generated by Pacific Steel and Recycling is a non-waste fuel product, pursuant to 40 CFR 241.3(b)(4), when combusted in GCC's Rapid City, South Dakota cement kiln.

To be designated as a non-waste fuel under 40 CFR 241.3(b)(4), the regulations require that processing of the NHSM meet the definition of processing in 40 CFR 241.2. After processing, the NHSM must also meet the legitimacy criteria for fuels in 40 CFR 241.3(d)(1). If the NHSM fails to meet these requirements, it is a waste and must be burned in a combustion unit meeting the applicable emissions standards issued under section 129 of the Clean Air Act (CAA).

The originally submitted permit application provided information regarding the ASR generation process and handling as well as contaminant comparison data to illustrate how the ASR meets the NHSM legitimacy criteria. After receiving the application and initial request for evaluation, EPA contacted GCC to request additional information regarding contaminant test results. To address EPA's questions, GCC submitted additional analyses and a new determination request on April 6, 2020. Subsequent emails on May 26, 2020 and August 10, 2020 provided additional data and clarifications of the information submitted.

Based on the information provided in the total sum of submitted materials, we believe that ASR generated at Pacific Steel and Recycling and burned in GCC's cement kiln would constitute a non-waste fuel under 40 CFR Part 241, provided specifications in your request are maintained. If these specifications are not maintained, the Agency may reach a different conclusion. The remainder of this letter outlines the information and logic used to reach this determination.[1]

[1] Note that a non-waste determination under 40 CFR Part 241 does not affect a state's authority to regulate a non-hazardous secondary material as a solid waste. Non-hazardous secondary materials may be regulated simultaneously as a solid waste by

Background Information

As stated in your April 2020 letter, GCC's Rapid City facility (the Combustion Facility) operates a pyroprocessing kiln system comprised of dual, four-stage preheat towers with precalciners and a rotary kiln. The traditional fuels used in this unit include coal, coke, and natural gas. The unit can also fire other traditional fuels such as wood, other cellulosic materials, and other liquid petroleum sources. GCC is planning to use ASR as an alternative fuel to supplement currently used fuels. For the purposes of this NHSM determination, GCC used coal as the comparison to ASR.

According to the information provided, ASR is derived from the processing of whole automobiles, appliances and similar durable goods into reusable raw materials. It is composed of plastics, rubber, foam, paper, fabric, and may contain some residual metal pieces, glass, sand, and dirt. Approximately 20 to 50 percent of unprocessed dry auto shredder residue is combustible, including plastics, fabric, and rubber. Incombustible components which are removed during processing include metals, glass, dirt, and ash.

Your letter indicates that the ASR Fuel to be combusted in GCC's cement kiln is produced entirely at Pacific Steel and Recycling (the Generator). A GCC affiliate (the Fuel Manager) that is also a subsidiary of GCC's parent company will manage the transportation and handling of the material from the Generator facility to the Combustion Facility.

According to your letter, GCC has established quality assurance and quality control procedures throughout the processes of generation, material management and final processing to assure that ASR Fuel is treated as a product versus solid waste. Whole automobiles and similar materials are received by the Generator from contracted commercial sources who are subject to rigid material acceptance standards to exclude the following:

- Radioactive materials
- Explosive materials and live munitions
- Biohazards, chemicals, and hazardous waste
- Ballasts, transformers or capacitors without non-PCB label
- Pressurized gas cylinders or sealed containers
- Tanks or drums without empty-tank certification
- Yard wastes
- Flammable liquids
- Mercury
- Asbestos

Regular audits of these contracted sources are conducted to ensure compliance. Your letter also notes that the Generator may also collect whole automobiles on its own from salvage yards using its own

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.

equipment and trained staff. Materials are received by the Generator via truck or rail and undergo visual screening and radiation screening using stationary and hand-held radiation detectors.

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 correspondence and supporting materials, taking into account the nature and content of the discarded material, as well as the types and extent of the operations performed on it. Thus, the same operations may constitute sufficient processing under the regulation to sufficiently "transform discarded non-hazardous secondary material into a non-waste fuel," whereas, the same operations in another scenario may not be sufficiently "transform" the material.

According to your letter, the materials used to produce auto shredder residue are under rigid source control. Materials reception protocols include mechanical, electronic, and visual examination to reinforce materials exclusion, and contaminants are removed by mechanical and manual means prior to processing. Once the materials have passed the materials reception protocols, the materials go through the auto shredder. The larger pieces of scrap metal are removed by magnets and recycled. The remaining auto shredder residue is prepared for fuel use by separation and processing to isolate the combustible materials with low ash content and low contaminant concentrations. Processing involves a combination of mechanical sorting, magnetic separation, density separation, eddy-current separation, and air induction separation. The result is a mixture of auto shredder residue that maximizes energy content while minimizing content of ash, chlorine and heavy metals.

The ASR processing steps described in your letter are summarized below.

Contaminant removal

Liquids such as washer fluid, brake fluid, antifreeze, gasoline, diesel fuel, and lubricating oil are evacuated mechanically from whole automobiles. Evacuated liquids are isolated for recycling using commercial liquid recovery equipment. Lead-acid batteries are removed and sent to an outside recycling facility. Mercury-containing devices such as mercury switches are removed manually by trained personnel. Pacific Steel and Recycling maintains a database that lists mercury-containing devices in automobiles by make and model.

Initial Processing

Whole automobiles are conveyor-fed into shredding machines that reduce materials to a particle size that can facilitate efficient separation. A final screening for radioactive materials is made at the point of size reduction using cross-belt radiation detectors. Size reduction is followed by

magnetic separation to remove ferrous metals from nonmetallic and nonferrous material. The non-metallic, non-ferrous portion is screened by size. Larger material undergoes additional size reduction by shredding. Size reduction and consistency in particle size assure efficient separation into components of non-ferrous material.

Processing of Non-Ferrous Materials

Non-ferrous material remaining after magnetic separation undergoes further processing into multiple reusable products using eddy-current induction separation and air induction separation processes. Mechanical feed systems deliver a uniform, thin, consistent material flow to maximize efficiency of eddy-current and sensor-based separation. Non-ferrous metals are removed and separated according to metal type and sold as recycled metals. Non-metallic components are further separated using air induction separation to create two more products, ASR Fuel and ferritic dirt.

Final Processing

Once the ASR Fuel leaves the Generator, processing is limited to simple size reduction via shredding and screening using conventional shredding equipment as necessary to meet particle size requirements for fuel feed equipment design. Sieve analysis at the GCC facility is used to determine the need for final processing.

Based on this information, we believe these operations meet the definition of processing in 40 CFR 241.2 and will transform the materials received at the Generator facility into a processed, non-waste fuel by significantly improving the fuel characteristics and removing contaminants.

Legitimacy Criteria

Under 40 CFR 241.3(d)(1), the legitimacy criteria for fuels include: 1) management of the material as a 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 a meaningful heating value and be used as a fuel in a combustion unit that recovers energy; and 3) the material must contain contaminants at levels comparable to or lower than those in traditional fuels that the combustion unit is designed to burn.

Manage as a Valuable Commodity

According to the information provided, all phases of transfer, storage, handling and management from the Generator to the point of combustion at the Combustion Facility meet the requirements of 40 CFR §241.3(d)(1)(i). ASR Fuel is not accumulated in any significant quantity or for any significant period of time at the Generator facility. Typical storage time is less than one month from the time of generation to the time the ASR Fuel is delivered to the Rapids City cement kiln. ASR Fuel is transported from the Generator to the Fuel Manager's facility in covered trucks with dump trailers or walking floor trailers. Incoming material is weighed, and weights are compared to weights on the bill of lading. Material is accounted for in accordance with inventory management practices established for other bulk solid fuel and raw material. Inventory is valued on a first-in-first-out basis. Inventories commonly contain a supply

sufficient for one to two weeks of operation. In instances where the Combustion Facility is not operating, for example during planned outages, ASR Fuel may be stored at the Fuel Manager facility for 30-90 days, but in no case longer than one year. As such, EPA expects that the storage of ASR will typically be less than 90 days, but in no case would exceed one year. "Reasonable time frames" vary according to the NHSM and industry involved and are not specifically defined within the NHSM rule. Based on the description of processing and use of ASR supplied, we believe that 90 days is a reasonable time frame for storage of ASR with the exception of limited instances where the ASR may not be used within 90 days due to extended outages at the Combustion Facility.

Your letter indicates that ASR Fuel is handled in a manner similar to that for coal to prevent releases to air, water or land, in accordance with 40 CFR §241.3(d)(1)(B) and (C). At the Generator facility, auto shredder residue production, transfer, storage, and loading are conducted in a way that minimizes air-borne and water-borne dispersion. Covered trucks, enclosed process equipment, and water mist are used to prevent airborne releases during transport and processing. Rainwater releases are controlled in accordance with storm water management plans.

Based on this information, we agree that ASR Fuel is managed as a valuable commodity.

Meaningful Heating Value and Used as a Fuel to Recover Energy

Your letter indicates an average heating value of 16,061 Btu/lb as received (16,210 dry basis) for ASR Fuel. The reported moisture content is less than 1 percent. As the Agency stated in the preamble to the NHSM final rule, NHSMs with an energy value greater than 5,000 Btu/lb, as fired are considered to have a meaningful heating value.[2] Because ASR Fuel has an average heating value above that threshold, the criterion that the NHSM has meaningful heating value is satisfied.

Comparability of Contaminant Levels

Your April 2020 letter included contaminant data for ASR Fuel against contaminants in coal for testing conducted in November 2015 and October 2018. In response to questions from EPA on non-TCLP data from 2015 included in the letter, you provided additional analytical data on May 26, 2020. In a subsequent phone call with EPA staff, you clarified that the October 2018 results represent solid matrix data (in addition to some TCLP analytical results also provided from 2015) and comprise a composite of weekly sampled material from 12 weeks of operation analyzed at least twice for each contaminant (i.e., duplicate or triplicate readings for each sample). A direct contaminant-to-contaminant comparison utilizing the data you provided is attached in Table 1.

Results for metal and non-metal elements and compounds, including volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) were lower than or within the range found in coal, the primary traditional fuel the Combustion Facility is designed to burn. As described in your letter, ASR sulfur content is typically very low (zero sulfur was reported for the October 2018 testing), and well below the levels found in coal. In addition, chlorine levels for the ASR Fuel are well within the lower range for coal.

[2] See 76 FR 15,482 (March 21, 2011) ("Except as otherwise noted, to satisfy the meaningful heating value criterion, the non-hazardous secondary material must have at least 5,000 Btu/lb, as fired (accounting for moisture), since the as-fired energy content is the relevant parameter that must be assessed to determine if it is being discarded rather than used as a fuel for energy recovery.") See also 76 FR 15,541.

The conclusion that GCC's ASR Fuel meets the contaminant legitimacy criterion for units designed to burn coal assumes that the material was tested for any contaminant expected to be present. Additional contaminants for which the ASR Fuel was not tested must be present at levels comparable to or lower than those in the appropriate traditional fuel, based on your knowledge of the material.

Conclusion

Overall, we find that GCC's ASR Fuel, based on the information provided to EPA in the submitted permit application, determination request letter, and supplemental information, meets both the processing definition and the legitimacy criteria outlined above when combusted in units designed to burn coal. Accordingly, we would consider ASR Fuel a non-waste fuel (as described in this letter) under the 40 CFR Part 241 regulations. This assumes that the above specifications in GCC's request are maintained. These 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 coal.

If you have any other questions regarding the non-waste determination, please contact Jesse Miller of my staff at (703) 308-1180.

Sincerely,

Andy Crossland

Andy Crossland, Acting Director
Materials Recovery and Waste Management Division
Office of Resource Conservation and Recovery

Enclosure

cc: Natalie Cannon, EPA Region 8 NHSM Coordinator

Enclosure

Table 1: Contaminant-by-Contaminant Comparison

Contaminant	Units	ASR Fuel[1]	Coal: Range[2]	Results of Comparison
Metal Elements – dry basis				
Antimony (Sb)	ppm	0.40	ND – 10	Within coal range
Arsenic (As)[3]	ppm	<0.10	ND – 174	Within coal range
Beryllium (Be)	ppm	0.051	ND – 206	Within coal range
Cadmium (Cd)	ppm	2.99	ND – 19	Within coal range
Chromium (Cr)	ppm	9.85	ND – 168	Within coal range
Cobalt (Co)	ppm	1.36	ND – 30	Within coal range
Lead (Pb)	ppm	37.6	ND – 148	Within coal range
Manganese (Mn)	ppm	44.2	ND – 512	Within coal range
Mercury (Hg)	ppm	0.22	ND – 3.1	Within coal range
Nickel (Ni)	ppm	25.2	ND – 730	Within coal range
Selenium (Se)	ppm	0.10	ND – 74.3	Within coal range
Non-metal elements – dry basis				
Chlorine (Cl)	ppm	1,640	ND – 9,080	Within coal range
Fluorine (F)	ppm	19.3	ND – 178	Within coal range
Nitrogen (N)	ppm	16,500	13,600 - 54,000	Within coal range
Sulfur (S)	ppm	0.00	740 - 61,300	Lower than coal
Volatile organic compounds (VOCs) – dry basis				
Benzene	ppm	0.036	ND – 38	Within coal range
Ethylbenzene	ppm	0.017	0.7 – 5.4	Lower than coal
Styrene	ppm	0.220	1.0 – 26	Lower than coal
Toluene	ppm	0.260	8.6 – 56	Lower than coal
Xylenes	ppm	0.710	4.0 – 28	Lower than coal
Semi-volatile organic compounds (SVOCs) – dry basis				
Naphthalene	ppm	0.066	No Data	Comparable to coal[4]
Biphenyl	ppm	ND	No Data	Comparable to coal[4]
Polycyclic hydrocarbons	ppm	0.066	14 – 2,090	Lower than coal

Notes:

1. Values are two run average from a quarterly composite of weekly samples. Testing was conducted in October 2018.
2. Ranges for Coal come from a combination of EPA data and literature sources, as presented in EPA document Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011, available at https://www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison.
3. Value shown reflects test detection level.
4. EPA has previously stated that, where a traditional fuel contains no detectable amount of a contaminant, the NHSM may contain a minimal (e.g., 1 ppm) and be considered comparable. See 76 FR 15,524, March 21, 2011.