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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R14-0037A
Plant ID No.:	037-00108
Applicant:	Roxul USA, Inc.
Facility Name:	RAN Facility
Location:	Jefferson County
NAICS Code:	327993
Application Type:	Modification
Received Date:	October 3, 2022, Resubmitted May 22, 2023
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$4,500
Date Received:	October 3, 2022 ($1,000); November 2, 2022 ($3,500)
Complete Date:	August 08, 2023
Due Date:	November 06, 2023
Applicant Ad Date:	October 5, 2022, republished on May 26, 2023
Newspaper:	*The Journal* AND *The Spirit of Jefferson*
UTM's:	Easting: 252.06 Northing:4,362.62 Zone: 18
Description:	Modification to make several changes to the process, including removal of coal as a fuel source, reallocation of CO emissions from IMF01 to HE01, removal of the Rockfon line, removal of cooling towers, modifications to the sizing of combustion sources, removal of product marking and a slight reduction in hours of operation of the mineral wool production facility and fleece application vents.

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BACKGROUND

On November 21, 2017, ROXUL USA, Inc. (ROXUL), a subsidiary of the Rockwool Group, submitted a permit application to construct a new mineral wool manufacturing facility at the "Jefferson Orchards" site in Ranson, Jefferson County, WV. The proposed facility, pursuant to 45CSR14, Section 2.43, was originially defined as a "major stationary source" and was, therefore, required to undergo PSD review according to the requirements of 45CSR14.

With this application, ROXUL updates the source details to reflect the facility as it was actually constructed. The changes to the facility include the following:

* Removal of coal transfer, storage and preparation equipment. The RAN facility will not fire coal and these sources were not installed.

* Reallocation of 8 pounds per hour of CO emissions from the Melting Furnace (IMF01) to the WESP (HE01).

* Removal, addition and modification of raw material handling sources, including haul roads.

* Removal and modification to the capacity of various storage tanks.

* Removal of cooling towers.

* Modification to the sizing of the combustion sources (eg boilers, fire pump engines etc.)

* Updates to release point parameters, including stack height and stack location coordinates.

* Removal of PMARK (Product Marking). Inkjet marking was not installed at RAN.

* Removal of Rockfon. The Rockfon line was not contructed.

* Reduction of the annual hours of operation of the mineral wool production facility from 8,760 to 8,400 hours per year. This reduction reflects the 2 weeks per year of downtime to conduct required maintenance on the facility. The 8,400 hours of operation represents the maximum hours of operation of the mineral wool production line. The material handling, tanks and paved haul roads will remain at 8,760 hours per year.

* Reduction of the annual hours of operation and application rate of Fleece Application Vents 1 & 2 (4,200 hours per year). This value is reflective of the maximum expected operations due to product demand.

The above changes, when taken in aggregate, decrease the facilitys potential to emit to less than the major source thresholds as defined in 45CSR14. Therefore, upon issuance of the new permit, the facility will no longer be a major source per 45CSR14.

PROCESS DESCRIPTION

ROXUL provided a detailed process description in Attachment G of the permit application (pages 31-43). Attachment G also details the changes reflected in the new application. The following detailed process description is taken largley (but not necessarily verbatim) from Attachment G.

The mineral wool line produces mineral wool insulation for residential, commercial, and industrial uses. Various types of insulating products can be produced with different densities, binder content, or dimensions to meet the requirements of various market sectors.

Mineral wool or “stone wool” is a natural product made partly from volcanic rocks. Rock may be supplemented with recycled mineral wool and slag from the steel industry. The following types of mineral raw materials are typically used in stone wool production:

* Eruptive stones such as basalt/diabase, amphibolite, and anorthosite
* Slags such as blast furnace slag or converter slag
* Dolomite and/or limestone
* Mineral additives, such as olivine sand and high alumina content materials such as bauxite, kaoline clay, and aludross (by-product of the smelting process in the creation of aluminum from bauxite)

The mineral wool fibers are made from stone raw materials melted at very high temperatures (>2,700°F /1480°C), binder, and de-dusting oil. The various raw materials used in the melting furnace are mixed in the correct ratio to achieve the required chemistry of the fibers. The mineral wool manufacturing process consists of material handling/charging, melting, spinning, curing, cooling, cutting, and packing. Raw materials will be delivered to the site via truck, and products will leave the site via truck.

Raw Material Handling

The following changes have been made to the raw material handling from the previous permit application:

* Conveyor Transition Point IMF11 is now located indoors. Emission calculations from this source have been updated to include an indoor settling factor in addition to the fabric filter already permitted.

Seven material handling fugitive emission points are proposed to be modified in the permit, which are listed below:

* RMS, which includes a raw material stockpile with a base area of 500 m^2;
* IMF17, which now includes 22 transfer points inside B220, Mixer and Crusher emissions inside B220 (previously included IMF18, which is proposed to be removed from the permit), and 2 transfer points with fabric filters inside B220;
* IMF11, which includes one transfer point inside B215;
* IMF12, which includes one transfer point inside B215;
* IMF16, which includes one transfer point inside B300;
* IMF15, which includes one transfer point outside B220; and
* IMF14, which includes a storage stockpile with a base area of 10 m^2.

Raw materials to be melted will be delivered in bulk by truck, unloaded and transferred with a front-end loader into the raw material stockpile (RMS) with three-sided enclosure. Additionally, diverted melt (rock) from the melting furnace will be delivered to a portable crusher (B170). The material from B170 and RMS will be transferred with a front end-loader to the raw material loading hopper (B215). The loading hopper feeds material onto a series of enclosed conveyors to the charging building (B220), where all subsequent melting raw material handling activities occur. A fraction of oversized material is directed to an indoor sieve and crusher, if required. Materials are then distributed to individual raw material bins. From here, they are dosed onto a belt conveyor to create a batch of charge material. The batch is conveyed into a bucket or similar vertical conveyor and then loaded into a mixer to create a homogeneous charge. The mixer is kept closed and equipped with an add-on filter that vents indoors during mixing.

The material handling sources IMF17, IMF12, IMF16, and IMF15, include emission sources as material moves from B215 to B220, moves through B220, and exits B220 to B300 (furnace building). IMF12 includes the transfer point from the loading hopper (located inside B215) to a conveyor. From B215, material transfers to a second conveyor, and this transfer point corresponds to IMF11. The material moves outside from B215 to B220, where there is a transfer point from a magnet separator into an iron container with a 4-sided drop guard corresponding to IMF15. Material is delivered to B220 by a conveyor transfer point which is included in IMF17. IMF17 includes 22 conveyor transfer points which are indoors but otherwise uncontrolled, as well as the two conveyor transition points, which are equipped with fabric filters. Additional transfer points inside B220 included with IMF17 are one transfer point from the magnet separator to the iron container with a telescopic chute and two transfer points, one which transfers material from the magnet separator to the feeder and the second from the feeder to the crusher. Once material leaves B220, it is transferred to B300. The conveyor transfer point located inside B300 corresponds to IMF16.

The two mechanical vents on the charging building were not installed. As described above, emissions from the Mixer and Crusher are included with the other new B220 Material Handling emissions (IMF17). IMF18 is proposed to be removed from the permit.

If raw materials entering the charging building are found to be outside of specifications it is possible to collect these materials in two locations, either after the sieve or after the raw material bins. The material is then directed into collection bins by conveyor, which is

equipped with curtains for enclosure (RM_REJ). S-REJ is proposed to be removed from the permit.

Emission points from material handling include:

* Charging Building Material Handling Building Vents (IMF17)
* Five (5) Conveyor Transition Points,

    * Conveyor Transition Point (B215 to B220) (IMF11)
    * Conveyor Transition Point (B210/B211 to B220) (IMF12)
    * Conveyor Transition Point (B220 No. 1) (IMF14)
    * Conveyor Transition Point (B220 No. 2) (IMF15)
    * Conveyor Transition Point (B220 to B300) (IMF16)

Fugitive emissions from material handling consist of:

* Raw Material Storage (B210/211),
* Raw Material Outdoor Stockpile (RMS)
* Raw Material Loading Hopper (B215)
* Raw Material Reject Collection Bin (RM_REJ)
* Paved Haul Roads

Melting

During start-up, a natural gas-fired preheater burner is used to warm the Melting Furnace baghouses to prevent condensation. Hot exhaust from the burner will indirectly heat the Melting Furnace baghouses before exhausting through the preheat burner stack (IMF24). The indirect heat transfer will be done by a thermal oil system including an expansion tank which is used both for preheating transfer of energy and to extract surplus heat for heat recovery. The natural gas preheat burner is rated at 5.12 MMBtu/hr heat input. The pre-heat burner will operate for approximately 2 hours prior to the Melting Furnace startup. Shortly after, stone raw materials are added and heated in the first and second preheat chambers to approximately 1,022 °F (550 °C) and 1,562 °F (850 °C), respectively. From here, the preheated raw materials are introduced to the melter.

During melting furnace operation, temperatures in the melter reach approximately 3,000 °F (1,650 °C) and the resultant melt flows out of the furnace to the spinner. Gutter channels are used to direct melt from the furnace onto the spinners. An exhaust is located above the gutters to remove heat from the area to lower the temperature in the working environment. This exhaust is directed to the Wet Electrostatic Precipitator (WESP) (HE01).

Once the system is operating at a steady state, waste wool and filter fines from the process are recycled into the melter along with stone raw materials.

Tapping is an emptying of the furnace, where melt flows directly out of the furnace and into a collection area. The tapped melt can be crushed in the portable crusher and reused in the melting process. Tapping occurs when the line shuts down, or as a result of an upset.

The melt process in the Melting Furnace is an oxidizing process, which operates with an excess of oxygen. The melting process is open to ambient building air with unrestricted air flow (i.e., there is no cover on the furnace). A “quench hood” connected to an exhaust riser is situated above the melter. The flue gas from the melter travels up through the riser and then through each preheating chamber, where the hot exhaust preheats stone raw materials prior to venting to add-on control devices.

In the furnace, the amount of air is determined to ensure optimal operation, which includes that the air carries particles (fine material) between the pre-heater cyclones. The air flow is also required to cool the air before the dust filters as the filters cannot withstand the hot air from the melting process.

The opening at the top of the melter allows for ambient air to be pulled into the riser, which facilitates an adequate temperature for a de-NO_x reaction to occur (typically 1,400-2,000 °F or 760-1,093 °C). Binder contained in the recycled wool can also contribute in the de-NOx reaction, but is not relied upon for the control of NO_x.

Hot flue gas is used to preheat incoming combustion air to the melter via heat exchangers situated at the outlet of the furnace. Flue gas is then directed to a baghouse to collect raw material fines. A second baghouse in series is used for control of emissions of filterable PM/PM_{10}/$PM_{2.5}$, and is equipped with sorbent injection to control sulfur dioxide (SO_2), sulfuric acid (H_2SO_4) mist, hydrogen chloride (HCl), and hydrogen fluoride (HF) emissions. Carryover of raw materials fines that are collected in the first baghouse will be pneumatically conveyed to a receiving silo and day silo (IMF07, IMF10) prior to reuse in the melter. The silos vent to a bin vent filter exhausting to the atmosphere.

De-sulfurization is applied for the control of sulfur oxides and acid gasses. Sorbent material (e.g., hydrated lime as calcium hydroxide or similar) is delivered to the site by truck and loaded into an outdoor storage silo equipped with a bin vent filter. Sorbent is then transported in a closed system and injected into the flue gas prior to the second baghouse as a filter media. Spent sorbent is stored in a silo (IMF09) (which is equipped with a bin vent filter) until it is emptied into a vacuum truck for off-site disposal.

Rockwool's protocol mandates a shutdown for 2 weeks of each year to conduct routine maintenance on the facility. As a result, the hours of operation for the mineral wool production line are proposed to be modified from 8,760 to 8,400 hours per year to represent the maximum potential operating hours for the facility. This modification applies to Pre-heat Burner (IMF24) and Melting Furnace (IMF01) in the melting process. The emission points for material handling operations, tanks, and paved roads remain unchanged at 8,760 hours per year.

ROXUL is proposing to remove 8 pounds/hour (35.04 tons/year) of Carbon Monoxide from the Melting Furnace (IMF01) potential to emit and add it to the WESP (HE01) potential to emit. The new Melting Furnace (IMF01) CO emission rate will be 3.21 pounds/ hour (13.48 tons/year). This proposal results from stack testing performed at the facility.

The Secondary Energy Materials Storage Silo (IMF07B) was not installed. The source IMF07 now only contains the Filter Fines Day Silo (IMF07A) which has also been updated to include an indoor settling factor.

Spinning, Curing and Cooling

The melt flows out of the lower part of the furnace and is led to the spinning machine via the gutter channels. The spinners are equipped with quick-rotating wheels onto which the melt is applied. The fibers are drawn from the wheels of the spinning machine by centrifugation combined with a powerful air stream that is blown into the spinning chamber. At the same time, binder and cooling water is added to the flow of fibers. Also, the material is sprayed with de-dusting oil to give water-repellent properties and reduce dust emission in the factory and the finished products. Binder and water are dosed as small droplets through nozzles on the spinning machine. Fibers not recovered in the spinning process are directed to the Recycle Plant for re-use in the furnace.

The binder-coated fibers are collected on a perforated surface (filter net). The fibers settle on the surface as primary wool web, and air is sucked through the perforation in a vertical direction.

Exhaust from the Spinning Chamber will be conditioned (e.g. with quenching or water spraying) prior to the WESP (HE01).

The wool web is conveyed to the pendulum (B400) which arranges multiple layers of wool onto the wool lane. For some products the edges will be cut along the wool lane by means of a mechanical saw before entering the curing oven. The removed edges, which is uncured wool (wet wool) is sent to the Recycle Plant via conveyors. The density of the secondary wool lane is measured by means of isotope or x-ray device.

The wool lane is conveyed into the Curing Oven, where the remaining water in the product is evaporated and the binder is cured by means of hot air supplied from two natural gas-fired circulation burners (via direct heating). The circulation burners have a maximum heat input capacity of 5.81 MMBtu/hr each. After leaving the Curing Oven, the wool web is conveyed through a Cooling Section where ambient air (from the production hall) is sucked through the cured wool web to cool it prior to cutting.

A natural-gas fired afterburner controls CO, VOC, and organic HAP emissions. Afterwards, the gasses are directed to the WESP (HE01). The Curing Oven afterburner is rated at 9.86 MMBtu/hr heat input capacity.

The curing oven is equipped with hoods at the inlet and outlet end to control the working environment in the event that hot air escapes the curing oven due to system pressure changes. The inlet and outlet hoods vent to the WESP (HE01).

The following emission points in the spinning, curing, and cooling process are proposed to be modified from 8,760 to 8,400 hours per year to represent the maximum potential operating hours for the facility:

* Curing Oven (CO), Curing Oven Afterburner (CO-AB), and Cooling Section (CS) (HE01)

* Dry Ice Cleaning (DI)

* De-dusting Baghouse (CE01) and

* Vacuum Cleaning Baghouse (CE02).

The spinning, curing, and cooling section are contributors of Carbon Monoxide to the WESP (HE01). As described in the Melting section above, it is proposed to remove 8 pounds/hour (35.04 tons per year) of Carbon Monoxide from the Melting Furnace (IMF01) potential to emit and add it to the WESP (HE01) potential to emit, based upon stack testing results. The combined spinning, cooling, and curing will now have a CO emission rate of 9.82 pounds/hour (37.41 tons/year).

Fleece Application Vent 1 (CM12) and Fleece Application Vent 2 (CM13) will be modified so that the annual hours of operation and application rate is reduced to 4,200 hours per year. As discussed below, this is reflective of the maximum expected operation for the fleece application, considering product demand.

Product Marking (P_MARK) has not been installed and is proposed to be removed from the permit.

Fleece Application

Fleece application stations were added to the line prior to the Curing Oven for use in specialty products. This permit application requests a reduction of the annual hours of operation and application rate on Fleece Application Vents 1 & 2 (4,200 hours per year). This value is reflective of the maximum expected operations due to product demand.

Rolls of fleece (fiberglass or similar facing) are situated at two unrolling stations, above and below the mineral wool conveyor. Each upper and lower fleece will be unrolled as a continuous sheet and directed via rollers through an open dip "bath" of binder. Each dip bath will coat one side of the upper and lower fleece with binder. The coated fleece will be directed towards the top and underside of the uncured mineral wool via rollers and placed onto the surface of the uncured wool just prior to entry into the Curing Oven. The uncured mineral wool with fleece applied to the top and underside will enter the Curing Oven, where binder in the wool and on the fleece will be cured.

Binder is fed to the dip baths via enclosed piping from the Binder Day Tank or from IBC containers (approximately 264 gal or 1 m3). The binder coating may be the same binder that is applied in the Spinning Chamber, or it can be a special binder.

Emissions from Fleece Application will consist of fugitive VOC and organic HAP emissions resulting from surface evaporation of binder in the dip tank and binder-coated fleece just prior to the Curing Oven. The majority of emissions from the binder applied to the fleece will be controlled by the Curing Oven afterburner as the fleece is cured onto the wet mineral wool in the Curing Oven.

After the cooling zone, the cured wool web is labeled with product features and cut to size by a water jet and/or mechanical cutting. Edges may be trimmed prior to labeling and transported to the Recycle plant via the line granulator. Labels are branded onto the product using laser marking.

Dust from the mechanical saws is removed pneumatically and directed to a baghouse filter (CE01). The collected dust/filter material is transported via closed conveyors to the Recycle Plant. Water/fiber generated by water jet cutting is collected in the process water system and reused in the process.

Stacking, Packing and Unit Load

After cutting, the products are stacked, packaged in polyethylene film, palletized (as needed), and transported to one of the storage areas for finished goods. A paper surface may be applied to products either before final cutting or after they are cut to size. The paper applied is a pre-coated polyethylene (PE) paper which is warmed in electrically

heated drums so that the paper adheres to the wool product. Dispatch of finished goods into trucks takes place from the unit load area.

Dust from the packaging area is collected by vacuum and directed to the Vacuum Cleaning Baghouse (CE02).

Recycling Plant

The Recycle Plant is used to recover materials (e.g., waste wool and de-dusting fines such as fibers and dust) from the mineral wool manufacturing line that would otherwise be sent to a landfill for disposal. The Recycling Plant can also receive mineral wool products returned from Rockwool customers, such as but not limited to products damaged in shipping, wool waste products from construction sites or directly from customers with the purpose to recover the material for new products.

The Recycle Plant process includes material handling by front end loaders (FEL) and conveyors, milling, and batching and is split into two ways of recycling:

* Direct recycling to the spinning chamber & wool collection process after sizing and milling, and

* Re-melting in the furnace after milling.

Direct recycling of wool waste consists of cured wool waste generated on the production line or damaged products from the warehouse. The cured wool waste is chopped up in pieces by knives in the line granulator, then placed in the cold end building (B500) or in the edge-trim system with a cutting screw, which is placed in the curing oven building (B400).

The wool pieces are conveyed by covered belt conveyors to a closed recycling silo (B405). From the silo the wool pieces are sent via the dosing system and milled to the required size, and pneumatically conveyed in a closed system back to the spinning and wool collection process. The recycling silo and part of the closed conveyor are placed outside the building.

In case of surplus of wool waste, the direct recycling system will unload on the floor inside the building B240 and the wool is collected for re-melting in the furnace.

A front end loader (FEL) is used to transfer wool waste from indoor collection areas inside the recycling building (B240) and into a loading hopper. Mineral wool products returned from Rockwool customers are received in big bags (or similar) and fed to the loading hopper via FEL. The loading hopper feeds wool into the mill via a screw conveyor or similar. Wool waste may also be recycled directly to the mill by means of a belt and

screw conveyor system. Waste wool is ground in the mill and exits via multiple conveyors to storage silos for milled wool waste. The hopper loading is connected to the de-dusting filter system (CE01). The silo area has one exhaust (CM08), and the area with the mill has one exhaust (CM09).

All of the re-melting recycling plant transfer and milling operations are conducted indoors. The building is kept closed with a fast roller gate controlled by the movement of the FEL. The building is equipped with roof ventilation equipped with particulate filters to control the working environment for industrial hygiene purposes (ammonia odor and mobile FEL exhaust gases).

The recycling plant consists of:

* De-dusting vents to De-dusting Baghouse (CE01); and

* Four (4) Recycle Building Vents (CM08, CM09, CM10, CM11)

Binder

Binders will be mixed onsite. The binder raw materials (resin and other binder components) are delivered to the site via tank truck and unloaded into storage tanks or delivered in drums/totes.

The binder storage consists of a series of tanks in a tank farm which is covered with a sheet roof but has no facades. A secondary containment is included in the structure.

The materials may be stored in temperature-controlled tanks. From the storage tanks the components are either mixed as a batch in a mixing tank or mixed in-line. Binder mixed in the Binder Mix Tank is pumped to the Circulating Tank and from there to the Binder Day Tank in the Furnace Building.

A separate storage system is made for the de-dusting oil due to fire requirements. Dedusting oil is delivered in bulk by truck or in drums or intermediate bulk container (IBC) and unloaded into the storage tanks. From the storage tank the oil is pumped into a day tank in the furnace building (B300) and from there dosed into the spinning & wool collection process.

ROXUL will use varying binder formulations as technology advances to produce formaldehyde-free resins. This application is designed to address the use of varying resin materials.

The binder consists of aqueous ammonia, silane (coupling agent), silicone oil/resin, ammonium sulfate, water, and sugar syrup that are added to the resin. Additional

components of the binder that are present in alternative resins are methanol, organic acid, and inorganic acid.

Tanks storing aqueous ammonia, ammonium sulfate, water, and sugar syrup do not emit regulated pollutants, but are included in this application for completeness.

Dry Ice Cleaning

For mineral wool products where product quality requirements necessitate additional cleaning of the perforated filter net, dry ice will be applied for cleaning. The filter net may also be cleaned using water. Dry ice pellets will be used for cleaning via blasting onto the perforated filter net. A pressurized storage tank will feed liquid CO_2 to a pelletizer unit which will form dry ice pellets (solid CO_2). The system continuously produces dry ice pellets which are fed to a blasting gun that directs the pellets to the perforated filter net.

Building Heat with Natural Gas Boilers

Building heat is supplied with natural gas boilers. Two natural gas-fired boilers were installed to provide a source of building heat when the furnace is not in operation (CM03, CM04). These two boilers were installed at a lower maximum rated heat input capacity of 4.99 MMBtu/hr (originally permitted at 5.1 MMBtu/hr).

Since, as mentioned previously, the Rockfon line was not installed the Rockfon building's natural gas-fired boiler for building heating (RFN10) is proposed to be removed from the permit.

Emergency Fire Pump Engines

The diesel engine fire pump was installed with a rating of 316 horsepower (hp). The emission factors for this source have been updated to reflect the manufacturer rating data, where available.

The engine is certified to NSPS Subpart IIII engine standards and will operate only during emergencies or other limited scenarios as allowed by federal rules (i.e., maintenance checks, readiness testing, etc.).

Process Water System

The process water system consists of a series of tanks and a filter for recirculation of process water. The collected water is filtered on a band filter and stored in buffer tanks. The filtered process water is used for dilution of binder and for flushing of processes (e.g. to transport fibers back in the system). Process water is also used for operation of the

WESP. Process water is collected storm water from outside areas to compensate for water loss due to evaporation. Additional water is supplied from the public water supply.

Storage Tanks

The following storage tanks are being added to the permit:

* One (1) Vertical Additive Buffer Tank, TK-ADB1 (396 gallons);
* One (1) Vertical Additive Buffer Tank, TK-ADB2 (132 gallons); and
* One (1) Vertical Glycol Storage Tank, TK-GLY (396 gallons).

The following storage tanks have updated sizing:

* One (1) Thermal Oil Horizontal Tank, TK-TO3 (5,283 gallons, previously 2,642 gallons);
* One (1) Thermal Oil Horizontal Expansion Tank, TK-TO4 (1,928 gallons, previously 1,321 gallons);
* Six (6) Resin Vertical Storage Tanks, TK-RS1 - TK-RS6 (13,209 gallons each, previously 15,850 gallons);
* One (1) Coupling Agent Vertical Storage Tank, TK-CA (396 gallons, previously 264 gallons); and
* One (1) Additive Vertical Storage Tank, TK-AD (396 gallons, previously 53 gallons).

The following storage tanks have been updated with current AP-42 calculation methodology:

* One (1) Diesel Fuel Horizontal Storage Tank, TK-DF (1,242 gallons);
* Three (3) Binder Storage Containers, TK-BS1-TK-BS3, (ea. 264 gallons);and
* One (1) De-dust Oil Vertical Day Tank, TK-DOD (264 gallons).

The following storage tanks were not installed and are proposed to be removed from the permit:

* One (1) Used Oil Horizontal Storage Tank, TK-UO (581 gallons);
* One (1) Resin Vertical Storage Tank, TK-RS7 (15,850 gallons);
* One (1) Vertical Binder Mix Tank, TK-BM (2,642 gallons);
* One (1) De-dust Oil Vertical Storage Tank, TK-DO (15,850 gallons);? One (1) Vertical Binder Circulating Tank, TK-BC (4,227 gallons);
* One (1) Binder Vertical Day Tank, TK-BD (793 gallons).
* One (1) Thermal Oil Horizontal Expansion Tank, TK-TO1 (212 gallons);? One (1) Thermal Oil Horizontal Drain Tank, TK-TO2 (159 gallons);
* One (1) Paint Dilution Storage Tank, TK-PD (793 gallons); and

* One (1) Paint Dilution Day Tank, TK-PDD (397 gallons).

Rockfon Line

The Rockfon line was not constructed and will, therefore, be removed from the permit. The following emission points will be removed as a result:

* IR Zone (RFNE1);
* Hot and Press Cure (RFNE2);
* High Oven A (RFNE3);
* High Oven B (RFNE9);
* Drying Oven 1 (RFNE4);
* Drying Oven 2 & 3 (RFNE6);
* Spray Paint Cabin (RFNE5);
* Cooling Zone (RFNE7); and
* De-dusting Baghouse (RFNE8).

Energy Material Handling

Since the RAN facility will not fire coal, the following emission points were not installed and will be removed from the permit:

* Three (3) Coal Storage Silos (IMF03A, IMF03B, IMF03C); and
* One (1) Coal Feed Tank (IMF25).

Cooling Towers

The two cooling towers (Melting Furnace Cooling Tower IMF02 and Gutter Cooling Tower (HE02) were not installed, and are proposed to be removed from the permit.

Coal Milling

Since the RAN facility will not fire coal, the following emission points were not installed and will be removed from the permit:

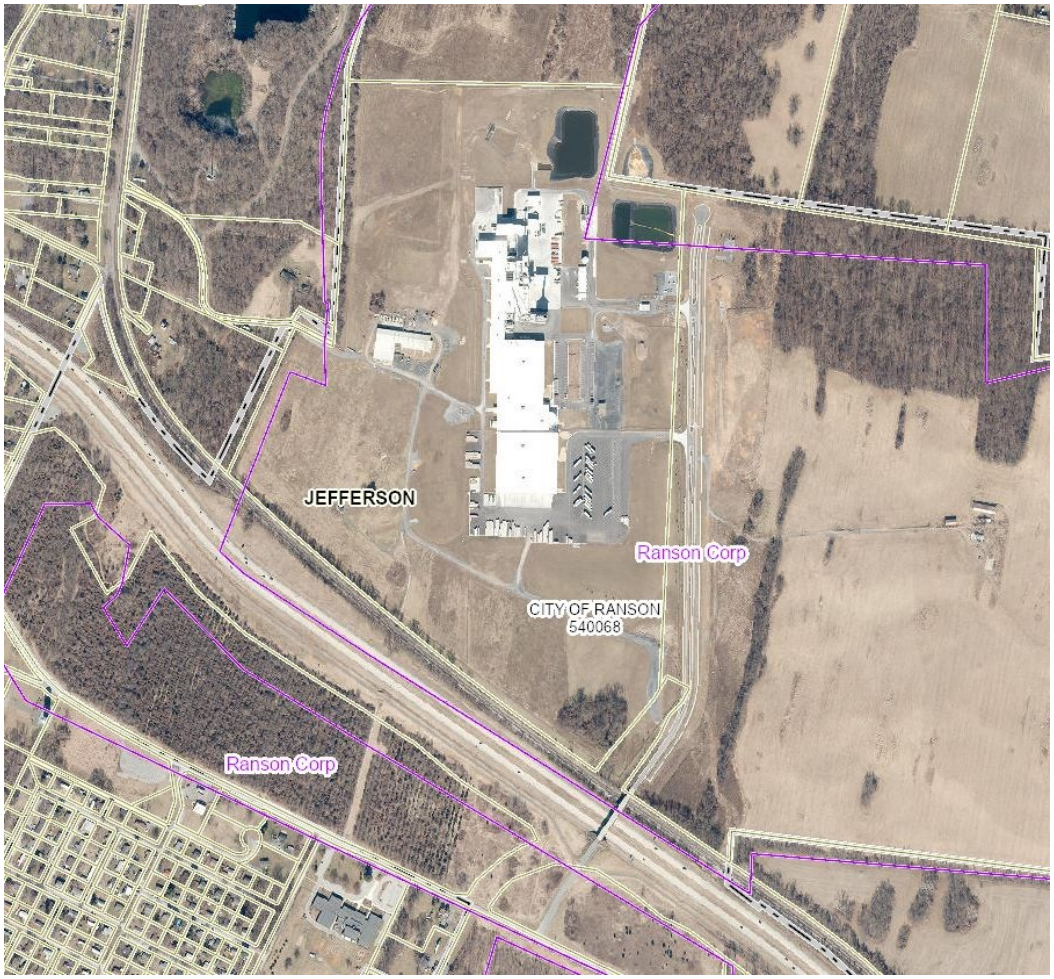
* Coal Conveyor Transition Point (B231 to B235) (IMF13);
* Coal Mill Burner & Baghouse (IMF05);
* Coal Milling De-dusting Baghouse (IMF06);
* Coal Conveyor Transition Point (B231 to B235) (IMF04);? Fugitive emissions from Coal Unloading (B230);
* Fugitive emissions from Coal Loading Hopper (B231); and? Fugitive emissions from Coal Milling Building (B235).

SITE INSPECTION

The last full on site facility inspection was performed by Joseph Kruger of DAQs Enforcement Section (Eastern Panhandle Regional Office) on September 23, 2022. The facility was determined to be in compliance (Status 30). Since then, DAQ personnel have performed 21 visible emission and odor checks. One check was as recent as August 8, 2023. The facility passed all of those VE checks and no objectionable odors were ever noted by DAQ personnel.

To get to the facility from the Interstate 81 - SR45/SR9 intersection (exit 12), travel on SR45/SR9 east for approximately 7.6 miles and take the Kearneysville/Leetown exit on the right. At the base of the exit ramp, turn right onto Leetown Road (CR 1) and travel for about 0.4 miles and turn left onto Border Road (CR 1/2) and go for 1.4 miles and turn left onto Northport Avenue. Travel on Northport Avenue approximately 0.6 miles to the facility on the left.

Below is an image of the facility and surrounding area taken from mapwv.com.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The faciity's existing permitted potential to emit was taken directly from engineering evaluation R14-0037 and is as follows:

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Melting Furnace	IMF01	11.21	49.10	37.37	163.67	7.47	32.73	8.22	36.01	9.79	42.88	33.63	147.31	11.66	51.08	3.43	15.04	21,814	95,547
WESP[2]	HE01	1.82	7.97	14.55	63.73	19.22	84.20	21.21	92.89	40.43	177.10	0.01	0.05	78.02	341.71	77.07	337.57	8,138	35,644
Gutter Cooling Tower	HE02	0.00	0.00	0.00	0.00	1.16e-03	0.01	2.31e-03	0.01	2.31e-03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Furnace Cooling Tower	IMF02	0.00	0.00	0.00	0.00	4.96e-03	0.02	1.00e-02	0.04	1.00e-02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Storage Silo A	IMF03A	0.00	0.00	0.00	0.00	6.00e-03	0.03	1.30e-02	0.06	1.30e-02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Storage Silo B	IMF03B	0.00	0.00	0.00	0.00	6.00e-03	0.03	1.30e-02	0.06	1.30e-02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Storage Silo C	IMF03C	0.00	0.00	0.00	0.00	6.00e-03	0.03	1.30e-02	0.06	1.30e-02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF04	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Milling Burner	IMF05	0.49	2.15	0.42	1.86	0.26	1.06	0.32	1.33	0.30	1.33	3.51e-03	0.02	0.41	1.65	0.01	0.05	703	3,079
CM De-Dusting Baghouse	IMF06	0.00	0.00	0.00	0.00	0.11	0.48	0.22	0.97	0.22	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Filter Fines Day Silo	IMF07A	0.00	0.00	0.00	0.00	6.89e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Secondary Energy Silo	IMF07B	0.00	0.00	0.00	0.00	6.89e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Sorbent Silo	IMF08	0.00	0.00	0.00	0.00	6.61e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Spent Sorbent Silo	IMF09	0.00	0.00	0.00	0.00	6.61e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Filter Fines Receiving Silo	IMF10	0.00	0.00	0.00	0.00	6.61e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF11	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF12	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Conveyor Transfer Point	IMF13	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF14	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF15	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Conveyor Transfer Point	IMF16	0.00	0.00	0.00	0.00	1.00e-02	0.04	1.90e-02	0.09	1.90e-02	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Charging Building Vent 1	IMF17	0.00	0.00	0.00	0.00	0.01	0.04	0.02	0.08	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Charging Building Vent 2	IMF18	0.00	0.00	0.00	0.00	0.01	0.04	0.02	0.08	0.02	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Vacuum Cleaning Filter	IMF21	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Preheat Burner	IMF24	0.42	1.84	0.36	1.58	0.04	0.17	0.04	0.17	0.04	0.17	0.00	0.01	0.03	0.12	~0.00	~0.00	600	2,627
Coal Feed Tank	IMF25	0.00	0.00	0.00	0.00	6.61e-03	0.03	0.01	0.06	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Portable Crusher[3]	B170	0.00	0.00	0.00	0.00	0.22	0.06	1.00	0.27	2.19	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0	0
RMS - Loading	B210	0.00	0.00	0.00	0.00	7.41e-02	2.00e-02	4.81e-01	1.30e-01	1.04e+00	2.80e-01	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Raw Material Loading	B215	0.00	0.00	0.00	0.00	9.08e-04	3.98e-03	6.00e-03	2.63e-02	1.27e-02	5.55e-02	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Unloading	B230	0.00	0.00	0.00	0.00	2.03e-04	5.49e-05	1.34e-03	3.63e-04	2.84e-03	7.67e-04	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Unloading Hopper	B231	0.00	0.00	0.00	0.00	2.03e-04	5.49e-05	1.34e-03	3.63e-04	2.84e-03	7.67e-04	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Coal Milling Building	B235	0.00	0.00	0.00	0.00	5.00e-03	2.00e-02	9.00e-03	4.00e-02	9.00e-03	4.00e-02	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Reject Bin	RM_REJ	0.00	0.00	0.00	0.00	8.57e-06	7.51e-05	5.51e-05	4.83e-04	1.16e-04	1.02e-03	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Reject Bin	S_REJ	0.00	0.00	0.00	0.00	8.34e-06	7.31e-05	5.51e-05	4.83e-04	1.16e-04	1.02e-03	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Raw Material Storage[4]	RMS	0.00	0.00	0.00	0.00	1.80e-03	7.87e-03	2.05e-02	9.00e-02	2.51e-02	1.10e-01	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Natural Gas Boiler 1	CM03	0.42	1.84	0.18	0.79	0.04	0.17	0.04	0.17	0.04	0.17	0.00	0.01	0.03	0.12	~0.00	~0.00	600	2,627
Natural Gas Boiler 2	CM04	0.42	1.84	0.18	0.79	0.04	0.17	0.04	0.17	0.04	0.17	0.00	0.01	0.03	0.12	~0.00	~0.00	600	2,627

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Recycle Building Vent 1	CM08	0.00	0.00	0.00	0.00	0.03	0.12	0.06	0.24	0.06	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Recycle Building Vent 2	CM09	0.00	0.00	0.00	0.00	0.03	0.12	0.06	0.24	0.06	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Recycle Building Vent 3	CM10	0.00	0.00	0.00	0.00	0.33	1.45	0.66	2.90	0.66	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Recycle Building Vent 4	CM11	0.00	0.00	0.00	0.00	0.33	1.45	0.66	2.90	0.66	2.90	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Fleece Application Vent 1	CM12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.53	28.58	6.53	28.58	0	0
Fleece Application Vent 2	CM13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0	0
De-dusting Baghouse	CE01	0.00	0.00	0.00	0.00	0.77	3.38	0.77	3.38	1.54	6.76	0.00	0.00	0.00	0.00	0.77	3.38	0	0
Vacuum Baghouse	CE02	0.00	0.00	0.00	0.00	0.22	0.97	0.22	0.97	0.44	1.93	0.00	0.00	0.00	0.00	0.22	0.97	0	0
Dry Ice Cleaning	DI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	364	1,594
P_MARK Combustion	P_MAR	0.03	0.14	0.04	0.17	2.96e-03	0.01	2.96e-03	0.01	2.96e-03	0.01	2.34e-03	1.06e-04	2.14e-03	9.39e-03	~0.00	~0.00	47	205
P_MARK Inks/Coatings		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	9.49	0.00	0.00	0	0
IR Zone	RFNE1	0.00	0.00	0.00	0.00	0.01	0.06	0.02	0.08	0.02	0.08	0.00	0.00	0.02	0.06	0.02	0.10	0	0
Hot Press	RFNE2	0.00	0.00	0.00	0.00	0.01	0.06	0.02	0.08	0.02	0.08	0.00	0.00	0.02	0.06	0.02	0.10	0	0
High Oven A	RFNE3	0.22	0.98	0.27	1.17	0.09	0.38	0.12	0.51	0.12	0.51	0.01	0.01	0.01	0.06	0.10	0.43	320	1,400
Drying Oven 1	RFNE4	0.17	0.73	0.20	0.87	0.06	0.27	0.08	0.36	0.08	0.36	0.01	0.01	0.01	0.05	0.08	0.34	240	1,050
Spraying Cabin	RFNE5	0.00	0.00	0.00	0.00	0.66	2.90	0.88	3.86	0.88	3.86	0.00	0.00	0.08	0.34	0.52	2.27	0	0
Drying Oven 2 & 3	RFNE6	0.39	1.71	0.47	2.04	0.09	0.41	0.13	0.55	0.13	0.55	0.01	0.01	0.03	0.49	0.15	0.66	559	2,450
Cooling Zone	RFNE7	0.00	0.00	0.00	0.00	0.14	0.63	0.19	0.84	0.19	0.84	0.00	0.00	0.12	0.48	0.21	0.91	0	0
De-Dusting Baghouse	RFNE8	0.00	0.00	0.00	0.00	0.17	0.75	0.34	1.49	0.34	1.49	0.00	0.00	0.00	0.00	0.34	1.49	0	0
Rockfon Glue & Coatings	Various	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.25	36.14	0.00	0.00	0	0
High Oven B	RFNE9	0.22	0.98	0.27	1.17	0.09	0.38	0.12	0.51	0.12	0.51	0.01	0.01	0.01	0.06	0.10	0.43	320	1,400
Building Heater	RFN10	0.42	1.84	0.18	0.79	0.04	0.17	0.04	0.17	0.04	0.17	0.00	0.01	0.03	0.12	~0.00	~0.00	600	2,627

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Storage Tanks	Various	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.19	0.03	0.12	0	0
Emergency Fire Pump	EFP1	1.13	0.28	1.30	0.32	0.08	0.02	0.08	0.02	0.08	0.02	2.14e-03	5.36e-04	0.19	0.05	~0.00	~0.00	1,120	56
Paved Haul Roads	n/a	0.00	0.00	0.00	0.00		0.10		0.43		2.18	0.00	0.00	0.00	0.00	0.00	0.00	0	0
Facility-Wide Total[6][7] →		***17.36***	***71.40***	***55.79***	***238.95***	***30.79***	***133.39***	***36.35***	***153.21***	***59.87***	***250.90***	***33.70***	***147.46***	***107.68***	***470.96***	***89.59***	***392.44***	***36,023***	***152,933***

(1) Includes condensables.
(2) WESP is the control device for the following sources venting to it: Gutter Exhaust, Spinning Chamber, Curing Oven Hoods, Curing Oven, Cooling Section, and the Afterburner.
(3) Includes emissions from drop from crusher to pit stockpile and erosion from stockpile.
(4) Includes both emission from delivery to stockpile as well as stockpile erosion.
(5) Does not include emissions from glue and coating application.
(6) The small differences in facility-wide totals from the tables in the Permit Application are primarily due to rounding differences.
(7) As the aggregate annual PTE of total HAPs is in excess of 25 TPY, the facility is defined as a major source of HAPs.

For the smaller sources at the facility, emissions from the modified facility were generally based on the same methodologies previously used and adjusted for any change in throughputs, hours of operation, additional control devices etc. Additionally some tank emissions were updated to reflect new AP42 methodologies. However, emission calculation methodologies for the two largest emission sources at the facility (Melting Furnace IMF01 and WESP HE01) were changed significantly. In the 2017 application, ROXUL based those emission calculations (mostly) on stack tests from another ROXUL facility. However, that facility was significantly different from the RAN facility. Given that ROXUL now has both CEMs and stack test data from actual operations at the RAN facility, emissions from those two sources are largley based on that data.

Melting Furnace IMF01

NOx and CO emissions are based on CEMS data collected since the facility began operation. VOC and SO_2 emissions are based on stack testing performed at the RAN Facility. Roxul then added a compliance safety margin for each pollutant. HAP emissions were based on a combination of stack testing done at the RAN Facility and stack testing performed at other ROXUL facilities. Roxul indicated that PM emissions were based on the 40CFR63 Subpart DDD emission limit of 0.10 pound of PM per ton of Melt. However, given Roxuls indicated throughput rate, their proposed limit of 2.32 pounds per hour is actually slightly lower than the Subpart DDD limit of 2.76 pounds per hour.

WESP (HE01)

All emissions are based on stack testing performed at the RAN Facility. A compliance safety margin was then added.

Note that ROXUL proposed a $PM/PM_{10}/PM_{2.5}$ emission limit of 12.00 pounds per hour and 50.39 tons per year. Stack testing done at the facility showed emissions of 4.62 pounds per hour (19.4 tons per year based on ROXULs proposed 8,400 hours per year of operation). It is DAQ's opinion that ROXUL did not submit a sufficient explanation showing that a compliance margin of 2.6x is justified in this case. Therefore, DAQ is utilizing an emission limit of 8 pounds per hour and 33.6 tons per year. This limit is based on a safety factor of 1.2 times the highest of the three individual runs of the November 2021 stack test. Given that compliance with the limit is demonstrated with an average of three runs, DAQ believes a limit of 1.2 times the highest run should provide a reasonable compliance margin.

HAPS

It should be noted that there is an unusual situation where total HAPs exceed VOCs and PM combined. The primary reason for this is that Roxul assumed 100% of PM and VOCs emitted from the WESP (by far the largest emission point at the facility) are HAPS. This is obviously a very conservative assumption because it assumes all PM is fine mineral fiber and that all VOCs are listed HAPs. It is also a departure from Roxuls calculation methodology in their 2018 application. In it, they speciated HAP/Non HAP VOCs and totalHAPs were far less than VOCs+PM.

Therefore when you assume all PM and VOCs from the largest source at the facility (by far) are HAPs and then add non PM/VOC HAPs (HCL, HF, COS etc.) from the rest of the facility (particularly the furnace), the total HAPs exceed PM and VOCs combined.

As can be seen below, the total HAP decrease due to this modification is 131.11 tpy. Most of this decrease comes from basing the PM and VOC emissions from the WESP on actual stack testing performed on the WESP. Other significant HAP reductions come from removal of the Rockfon line and a reduction in hours of operation of the Fleece Application Vents from 8,760 hours per year to 4,200 hours per year.

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Melting Furnace	IMF01	3.21	13.48	37.37	156.95	2.32	9.73	2.32	9.73	2.32	9.73	33.63	141.25	0.31	1.29	3.43	14.42	18336.00	77077.00
WESP[2]	HE01	9.82	41.24	1.57	6.60	8.00	33.60	8.00	33.60	8.00	33.60	0.01	0.05	44.66	187.55	56.65	237.95	8492.77	35669.62
Filter Fines Day Silo	IMF07A	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--	--	--	--	--	--	--
Sorbent Silo	IMF08	--	--	--	--	0.01	0.03	0.01	0.06	0.01	0.06	--	--	--	--	--	--	--	--
Spent Sorbent Silo	IMF09	--	--	--	--	0.01	0.03	0.01	0.06	0.01	0.06	--	--	--	--	--	--	--	--
0.04Filter Fines Receiving Silo	IMF10	--	--	--	--	0.01	0.03	0.01	0.06	0.01	0.06	--	--	--	--	--	--	--	--
Conveyor Transfer Point	IMF11	--	--	--	--	0.01	0.01	0.01	0.02	0.01	0.02	--	--	--	--	--	--	--	--
Conveyor Transfer Point	IMF12	--	--	--	--	0.01	0.02	0.01	0.02	0.01	0.06	--	--	--	--	--	--	--	--
Raw Mat. Reject Stock.	IMF14	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--	--	--	--	--	--	--
Conveyor Transfer Point	IMF15	--	--	--	--	0.01	0.03	0.01	0.03	0.02	0.08	--	--	--	--	--	--	--	--
Conveyor Transfer Point	IMF16	--	--	--	--	0.01	0.02	0.01	0.02	0.01	0.06	--	--	--	--	--	--	--	--
B220 Material Handling	IMF17	--	--	--	--	0.13	0.56	0.14	0.61	0.34	1.49	--	--	--	--	--	--	--	--
Vacuum Cleaning Filter	IMF21	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--	--	--	--	--	--	--
Preheat Burner	IMF24	0.42	1.76	0.36	1.52	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.01	0.03	0.12	0.01	0.04	599.25	2519.44
Portable Crusher[3]	B170	--	--	--	--	0.01	0.01	0.01	0.02	0.01	0.04	--	--	--	--	--	--	--	--
RMS - Loading	B210	--	--	--	--	0.07	0.02	0.48	0.13	1.04	0.28	--	--	--	--	--	--	--	--
Raw Material Loading	B215	--	--	--	--	0.01	0.01	0.01	0.03	0.01	0.06	--	--	--	--	--	--	--	--
Raw Mat. Outdoor Stock.	RMS	--	--	--	--	0.01	0.01	0.01	0.05	0.03	0.11	--	--	--	--	--	--	--	--
Reject Bin	RM_REJ	--	--	--	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--	--	--	--	--	--	--
Raw Material Storage[4]	RMS	--	--	--	--	0.01	0.01	0.01	0.04	0.02	0.09	--	--	--	--	--	--	--	--

Emission Unit	EP ID	CO		NO_x		$PM_{2.5}$[1]		PM_{10}[1]		PM[1]		SO_x		VOCs		HAPs		CO_2e	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Natural Gas Boiler 1	CM03	0.42	1.76	0.36	1.52	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.01	0.03	0.12	0.01	0.04	599.87	2519.44
Natural Gas Boiler 2	CM04	0.42	1.76	0.36	1.52	0.04	0.16	0.04	0.16	0.04	0.16	0.01	0.01	0.03	0.12	0.01	0.04	599.87	2519.44
Recycle Building Vent 1	CM08	--	--	--	--	0.03	0.12	0.06	0.24	0.06	0.24	--	--	--	--	--	--	--	--
Recycle Building Vent 2	CM09	--	--	--	--	0.03	0.12	0.06	0.24	0.06	0.24	--	--	--	--	--	--	--	--
Recycle Building Vent 3	CM10	--	--	--	--	0.33	1.45	0.66	2.90	0.66	2.90	--	--	--	--	--	--	--	--
Recycle Building Vent 4	CM11	--	--	--	--	0.33	1.45	0.66	2.90	0.66	2.90	--	--	--	--	--	--	--	--
Fleece Application Vent 1	CM12	--	--	--	--	--	--	--	--	--	--	--	--	3.26	6.85	3.26	6.85	--	--
Fleece Application Vent 2	CM13	--	--	--	--	--	--	--	--	--	--	--	--					--	--
De-dusting Baghouse	CE01	--	--	--	--	0.21	0.94	0.21	0.94	0.21	0.94	--	--	--	--	0.21	0.94	--	--
Vacuum Baghouse	CE02	--	--	--	--	0.22	0.93	0.22	0.93	0.44	1.85	--	--	--	--	0.22	0.93	--	--
Dry Ice Cleaning	DI	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	363.76	1527.80
Storage Tanks	Various	--	--	--	--	--	--	--	--	--	--	--	--	0.03	0.12	0.03	0.11	--	--
Emergency Fire Pump	EFP1	0.42	0.10	1.78	0.45	0.07	0.02	0.07	0.02	0.07	0.02	0.01	0.01	0.06	0.01	0.01	0.01	361.99	90.50
Paved Haul Roads	n/a	--	--	--	--		0.13		0.55		2.76	--	--	--	--	--	--	--	--
Facility-Wide Total[6][7] ➜		***14.71***	***60.10***	***41.80***	***168.56***	***12.01***	***49.80***	***13.15***	***53.72***	***14.17***	***58.17***	***33.68***	***141.34***	***48.41***	***196.18***	***63.84***	***261.33***	***29353.51***	***121923.24***

(1) Includes condensables.
(2) WESP is the control device for the following sources venting to it: Gutter Exhaust, Spinning Chamber, Curing Oven Hoods, Curing Oven, Cooling Section, and the Afterburner.
(3) Includes emissions from drop from crusher to pit stockpile and erosion from stockpile.
(4) Includes both emission from delivery to stockpile as well as stockpile erosion.

As can be seen from the above tables, the total **DECREASE** in emissions from the facility due to this application is as follows:

CO		NO_x		$PM_{2.5}$[(1)]		PM_{10}[(1)]		PM[(1)]		SO_x		VOCs		HAPs		CO_2e
lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	TPY
2.65	11.30	13.99	70.39	18.78	83.59	23.20	99.49	45.70	192.73	0.02	6.12	59.27	274.78	25.75	131.11	31010.00

REGULATORY APPLICABILITY

The following state and federal rules apply to the modification.

STATE RULES

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers

Pursuant to the definition of "fuel burning unit" under 45CSR2 ("producing heat or power by indirect heat transfer"), 45CSR2 applies to the PreHeat Burner (IMF24) and Natural Gas Boilers 1 and 2 (CM03 and CM04), and these units are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of each of the units is less than 10 mmBtu/hr, the units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement is under Section 3.1 - Visible Emissions Standards.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, each of the above specified units are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and the use of PNG as fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

There are no changes to the applicability of 45CSR6 due to this application. Rule 6 remains applicable to the Curing Oven Afterburner (CO-AB).

Pursuant to §45-6-4.1, PM emissions from incinerators are limited to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

ROXUL calculated the maximum capacity of the afterburner to be 24.4 tons/hour. Using this value in the above equation produces a PM emission limit of 66.37 lbs/hr. This permit will limit total PM emissions from the WESP (including emissions from sources other than the afterburner) to 8.00 pounds per hour. This is far below the 45CSR6 limit.

45CSR7 To Prevent & Control Particulate Matter Air Pollution From Manufacturing Process & Associated Operations

45CSR7 has requirements to prevent and control particulate matter air pollution from manufacturing processes and associated operations. Pursuant to §45-7-2.20, a "manufacturing process" means "any action, operation or treatment, embracing chemical,

industrial or manufacturing efforts . . . that may emit smoke, particulate matter or gaseous matter." 45CSR7 has three substantive requirements potentially applicable to the particulate matter-emitting operations at the RAN Facility. These are the opacity requirements under Section 3, the mass emission standards under Section 4, and the fugitive emission standards under Section 5. Each of these sections will be discussed below.

45CSR7 Opacity Standards - Section 3

§45-7-3.1 sets an opacity limit of 20% on all "process source operations." Pursuant to §45-6-2.38, a "source operation" means the last operation in a manufacturing process preceding the emission of air contaminants [in] which [the] operation results in the separation of air contaminants from the process materials or in the conversion of the process materials into air contaminants and is not an air pollution abatement operation." This language would define all particulate matter emitting sources as "source operations" under 45CSR7 and, therefore, these sources would be subject to the opacity limit [after control]. Based on the ROXUL's proposed use of BACT-level particulate matter controls [such as baghouses, fabric filters, enclosures, etc.], these measures should, if maintained and operated correctly, allow the particulate matter emitting sources to operate in compliance with the 20% opacity limit.

45CSR7 Weight Emission Standards - Section 4

§45-7-4.1 requires that each manufacturing process source operation or duplicate source operation meet a maximum allowable "stack" particulate matter limit based on the weight of material processed through the source operation. As the limit is defined as a "stack" limit (under Table 45-7A), the only applicable emission units (defined as a type ‘a' sources) are those that are non-fugitive in nature. The particulate matter limits given under 45CSR7 only address filterable particulate matter.

Due to the large process weight-rates used in the production of mineral wool and the BACT-level particulate matter controls on particulate matter-emitting units, it is reasonable to assume that the Table 45-7A limits will be easily met. In its original application ROXUL, divided the facility into four sections for 45CSR7 compliance demonstration: Mineral Wool Line, Rockfon Line, Coal Milling, and Material Handling. They then used the process weight rate (PWR) of each line to determine what the aggregate Table 45-7A particulate matter limit would be. This analysis showed that the aggregate particulate matter emissions from each section was in compliance with the calculated emission limit. Note that the Coal Milling and Rockfon Lines were not constructed and will be removed from the permit.

This method is very conservative as 45CSR7 allows the use of the PWR on an emissions-unit basis to calculate the particulate matter limit for that specific emissions unit. As most processes are serial in nature, the aggregate limit (or a value near to it) would apply in most cases on an individual emission-unit basis and not on the aggregate emissions of a group of emission units. Therefore, using the line PWR to determine an aggregate emission limit is considered a reasonable (and very conservative) methodology to determine §45-7-4.1 compliance with a large number of particulate matter sources.

§45-7-4.2 requires that mineral acids shall not be released from manufacturing process source operation or duplicate source operation in excess of the quantity given in Table 45-7B. While it was appropriate to conservatively classify all the particulate matter generating source operations as type ‘a' above, the generation of mineral acids only occurs in the Melting Furnace through the melting of slag and other mineral feedstocks. For this reason, the Melting Furnace is appropriately defined as a type ‘d' source ("type 'd' means any manufacturing process source operation in which materials of any origin undergo a chemical change, and this chemical change results in the emission of particulate matter to the atmosphere"). The unit has potential emissions of sulfuric acid and hydrochloric acid, both which are regulated under Table 45-7B. The limit for type ‘d' sources is: H_2SO_4 - 70 mg/m^3, HCl - 420 mg/m^3. The proposed emission rates of H_2SO_4 and HCl from the Melting Furnace are 50 and 3.9 mg/m^3, respectively. The proposed emission rates are in compliance with the Table 45-7B limits.

45CSR7 Fugitive Emissions - Section 5

Pursuant to §45-7-5.1 and 5.2, each manufacturing process or storage structure generating fugitive particulate matter must include a system to minimize the emissions of fugitive particulate matter. The use of various BACT-level controls (where reasonable) on material transfer points, the paving and use of a vacuum sweeper truck on the haul roads, and the management of on-storage pile activity is considered a reasonable system of minimizing the emissions of fugitive particulate matter at the proposed facility.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing processes," and limiting hydrogen sulfide (H_2S) concentrations in process gas streams. The proposed PreHeat Burner (IMF24) and Natural Gas Boilers 1 and 2 (CM03 and CM04) are each defined as fuel burning units ("producing heat or power by indirect heat transfer"). However, pursuant to the exemption given under §45-10-10.1, as the MDHI of each of these units is less than 10 mmBtu/hr, these units are not subject to the limitations on fuel burning units under 45CSR10. The proposed ROXUL facility does not combust any process gas streams that potentially contain H_2S.

However, the Melting Furnace stack, after control by the sorbent injection system, is subject to the limitation on in-stack SO_2 concentrations. Pursuant to §45-10-4.1, the Melting Furnace stack (IMF01) shall not exceed "an in-stack sulfur dioxide concentration [of] 2,000 parts per million by volume." Based on information submitted by ROXUL (IMF01: 33.63 lb-SO2/hr, 21,413.73 acfm, 301.73 F), the writer calculated a maximum in-stack SO2 concentration of 227.48 ppmv, or approximately 11% of the §45-10-4.1 limit.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed increase to the CO emission limit from the WESP exceeds 6 pounds per hour and 10 tons per year. Therefore a change in the permit is required. Since all changes at the facility result in a large decrease in emissions, the permitting action qualifies to be processed as a Class II Administrative Update. However, per her authority under §45-13-4.1, the Director required the change be submitted as a full modification. As required under §45-13-8.3 ("Notice Level A"), ROXUL placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ads first ran on October 5, 2022 in *The Journal* AND *The Spirit of Jefferson* and the affidavit of publication for these legal advertisements were submitted to the WVDAQ on November 17, 2023.

After multiple discussions between ROXUL and DAQ, it was determined that significant changes needed to be made to the permit application. ROXUL reran the ads at the time the revised application was submitted. The ad ran in *The Journal* on May 26, 2023 and ran in the *Spirit of Jefferson* on May 31, 2023. The affidavits of publication for both ads were submitted to the WVDAQ on August 8, 2023.

45CSR14 Permits For Construction And Major Modification Of Major Stationary Sources Of Air Pollution For The Prevention Of Significant Deterioration ***(Non Applicability)***

45CSR14 sets the requirements for the new construction of a "major stationary source" (as defined under §45-14-2.43) of air pollution, on a pollutant-by-pollutant basis, in areas that are in attainment with the National Ambient Air Quality Standards (NAAQS). A proposed facility is defined as a "major stationary source" if, pursuant to §45-14-2.43, any regulated pollutant has a potential-to-emit in excess of 250 TPY (if a proposed source

is listed as one of the source categories under §45-14-2.43, then the major stationary threshold is defined at 100 TPY). Additionally, pursuant to §45-14-8.2, Best Available Control Technology (BACT) applies to each pollutant proposed to be emitted in "significant" (as defined under §45-14-2.74) amounts.

When ROXUL first submitted its original permit application in 2017 the projected potential to emit of VOCs exceeded 250 tons per year (the facility type is a "non-listed" source) and PSD review was required. Since NO_x, $PM_{2.5}$, PM_{10}, PM, SO_2, VOCs, GHGs, and H_2SO_4 exceeded the significance threshold, they were also subject to PSD review. The substantive requirements of a PSD review includes a BACT analysis, an air dispersion modeling analysis, a review of potential impacts on Federal Class 1 areas, and an additional impacts analysis. All of these analyses were performed during the 2017 application review.

However, based upon actual stack testing performed at the RAN facility, it has been determined that the actual PTE of VOCs from the facility are significantly less than 250 tons per year. Therefore, with the issuance of permit R13-0037A, the RAN facility will no longer be defined as a major source per 45CSR14. It should be noted that, despite this reclassification, no weakening or removal of any BACT level control requirement will be included in the new permit.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The RAN Facility does still meet the definition of a "major source under §112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. The proposed facility-wide PTE of a regulated pollutant does exceed 100 TPY. Therefore the source is a major source subject to 45CSR30. The Title V (45CSR30) application has been submitted to WVDAQ and is currently under review.

FEDERAL RULES

40 CFR 60, SUBPART OOO: Standards Of Performance For Nonmetallic Mineral Processing Plants.

Subpart OOO is the federal NSPS relating to the performance of non-metallic mineral processing plants. The proposed RAN Facility contains equipment that is applicable to Subpart OOO. The following discusses the substantive applicable requirements of Subpart OOO relating to the RAN Facility.

Pursuant to §60.670, affected facilities under Subpart OOO include "each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station" located at a "fixed or portable nonmetallic mineral processing plant[s]." Pursuant to §60.671, "Non-metallic processing plant" is defined as "any combination of equipment that is used to crush or grind any nonmetallic mineral. . ." The definition of "non-metallic mineral" includes limestone, dolomite, and other minerals which may be contained in stone raw materials that are sieved, crushed (if necessary), and conveyed at the RAN Facility. Therefore, Subpart OOO is applicable to various equipment/operations at the facility.

However, the recycling operations (do not involve non-metallic minerals handling) and the melting furnace portable crusher (less than 150 tons per hour capacity) are not subject to Subpart OOO. Additionally, raw material handling in the furnace building is not considered a non-metallic mineral processing plant as it is part of the mineral wool production operations.

Per §60.672(d), truck dumping of nonmetallic minerals into any screening operation, feed hopper, or crusher is exempt from PM standards of NSPS Subpart OOO, which would exclude the Raw Material Loading Hopper (B215). Vacuum systems are not identified as

affected facilities in NSPS Subpart OOO; therefore, the Charging Building Vacuum Cleaning Filter (IMF21) is not subject to NSPS Subpart OOO. The remaining affected sources subject to PM emissions limits include the belt conveyor connected to the charging building (IMF11); indoor conveyor transfer points IMF12 and IMF16; outdoor transfer point IMF15; indoor sieve, crusher, storage bins, and belt conveyors located inside the charging building (represented by IMF17); Raw Material Reject Outdoor Collection Bin (RM_REJ); and indoor Sieve Reject Collection Bin (S_REJ). The Filter Fines Day Silo (IMF07) and Filter Fines Receiving Silo (IMF10) are conservatively considered as part of the nonmetallic mineral processing plant because the silos will store stone or mineral raw materials that have been through the charging building operations.

Table 4-1 in the permit application (pp. 9) provides a summary of Subpart OOO in tabular form.

Section §60.672 sets the following particulate matter standards for affected facilities under Subpart OOO:

Subpart OOO Emission Standards

Reference	Affected Facility	Stack Emissions	
		Mass (gr/dscf)[1]	Opacity (%)
Table 2	Affected Facilities with Capture Systems	0.014	n/a
Table 3	Affected Facilities (non-crushers) without Capture Systems	n/a	7
Table 3	Crushers without Capture System	n/a	12
§60.672(d)	Truck Dumping	n/a	n/a
§60.672(e)	Affected Facilities inside a Building	Must meet Table 2 or Table 3 limits or building openings/vents must meet:	
	Building Openings	n/a	7
	Building Vents	Table 2 Limits	n/a
§60.672(f)	Enclosed Storage Bins w/ Baghouse	n/a	7

40 CFR 60, Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII of 40 CFR 60 is the NSPS for stationary compression ignition internal combustion engines (diesel fired engines). Section §60.4200 states that "provisions of [Subpart IIII] are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE)." Specifically, §60.4200(a)(2) states that Subpart IIII applies to "[o]wners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

ROXUL has installed a 316 hp certified fire pump engine (with a displacement of less than 30 liters per cylinder). Pursuant to §60.4205(c), "owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants." Table 4 of Subpart IIII gives the following limits for ROXUL's proposed fire pump engine:

Emission Standards - g/kW-hr (g/hp-hr)		
NMHC + NO_x	CO	PM
4.0 (3.0)		0.20 (0.15)

Pursuant to §60.4211(c), ROXUL purchased an engine certified to comply with the standards given above. Additionally, ROXUL has or will:

Operate and maintain the engine according to the manufacturer's emission related written instructions, change only those emission-related settings as permitted by the manufacturer, and comply with 40 CFR parts 89, 94 and/or 1068, as they apply [§60.4211(a)];

Install a non-resettable hour meter and limit operation to 100 hours per year of recommended maintenance checks and readiness testing, 50 of those hours may be used for non-emergency operation [§60.4209(a), §60.4211(f)];

Purchase diesel fuel meeting a sulfur content of 15 ppm and a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent pursuant to 40 CFR §80.510(b) for non-road diesel fuel [§60.4207(b)]; and

Record-keeping of conducted maintenance and operating hours, including reason for operation, and any other applicable notification8, reporting, and record-keeping requirements of §60.4214.

40 CFR 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units - ***(Non-Applicable)***

40 CFR 60, Subpart Dc is the federal New Source Performance Standard (NSPS) for industrial/commercial/institutional steam generating units for which (1) construction, modification, or reconstruction is commenced after June 19, 1984, (2) that have a MDHI between 10 and 100 mmBtu/hr, and (3) meet the definition of a "steam generating unit." Pursuant to §60.41(c), "Steam generating unit" under Subpart Dc means "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. . . This term does not include process heaters as defined in this subpart." A "process heater" is defined as "a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst."

The PreHeat Burner (IMF24) and Natural Gas Boilers 1 and 2 (CM03 and CM04) are each defined as a "steam generating unit" but each also has an MDHI of less than 10 mmBtu/hr which would exempt the units from Subpart Dc. The remaining combustion units either do not use a heat transfer medium or are properly defined as a process heater and, therefore, no units at the proposed facility will be subject to Subpart Dc.

40 CFR 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984) - ***(Non-Applicable)***

40 CFR 60, Subpart Kb is the federal NSPS for storage tanks which contain Volatile Organic Liquids (VOLs) and commenced construction after July 23, 1984. The Subpart applies to storage vessels used to store volatile organic liquids with a capacity greater than or equal to 75 m3 (19,813 gallons). However, storage tanks with a capacity greater than or equal to 151 m3 (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m3 but less than 151 m3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa are exempt from Subpart Kb. All tanks that store VOLs at the facility have capacities less than 75 m3 (19,813 gallons) and are, therefore, not subject to Subpart Kb.

40 CFR 60 Subpart VVV: Standards Of Performance For Polymeric Coating Of Supporting Substrates Facilities - ***(Non-Applicable)***

40 CFR 60, Subpart VVV is the NSPS for the web coating process that applies elastomers, polymers, or prepolymers to a supporting web other than paper, plastic film, metallic foil, or metal coil. Subpart VVV is not applicable to any of the coating operations at the facility primarily due to the low-VOC content of the binders that would otherwise trigger Subpart VVV applicability.

40 CFR 63, Subpart DDD: National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production

Subpart DDD of 45 CFR 63 applies to owners or operators of mineral wool production facilities that are located at major sources of HAP emissions. Beginning in November 2011, the EPA proposed a series of revisions to the Mineral Wool MACT as required by the residual risk and technology review per the CAA. The final revisions were promulgated in the Federal Register and made effective on July 29, 2015.

The ROXUL facility is subject to the requirements for new affected facilities under the Mineral Wool MACT (the RAN Facility is defined as a major source of HAPs). Although ROXUL's Melting Furnace design can be differentiated from that of a traditional cupola, it does meet the current NESHAP Subpart DDD definition of a cupola ("a large, water-cooled metal vessel to which a mixture of fuel, rock and/or slag, and additives is charged and heated to a molten state for later processing"). The revised standard includes emissions limits for carbonyl sulfide (COS) for open-top and closed-top cupolas (which replaces the CO limit under the previous rule), hydrogen fluoride (HF) and hydrochloric acid (HCl) limits for cupolas with and without slag, and combined collection (spinning) and curing oven emission limits for formaldehyde, methanol, and phenol.

Pursuant to §63.1178(a), the emission limits are given under Table 2 of Subpart DDD. The final revised emission limitations for new affected sources and the subcategories applicable to ROXUL are given below.

Affected Facility	Emission Unit (Emission Point)	Limitation	Citation
Cupolas(1)	Melting Furnace (IMF01)	0.10 lb PM/ton melt	Table 2, Item 2
Open-top Cupola(2)		3.2 lb COS/ton of melt	Table 2, Item 8
Cupola using Slag(3)		0.015 lb HF/ton of melt 0.012 lb HCl/ton of melt	Table 2, Item 10
Combined Vertical(4) Collection/Curing	Gutter Exhaust, Spinning Chamber, Curing Oven, Cooling Section (HE01)	2.4 lb formaldehyde/ton of melt 0.71 lb phenol/ton of melt 0.92 lb methanol/ton of melt	Table 2, Item 24

(1) The NESHAP Subpart DDD limit for PM is for filterable PM only.
(2) The Melting Furnace design is open-top, because there is an opening at the top of the melter and air flow is unrestricted.
(3) The Melting Furnace uses slag as a feed material.
(4) NESHAP Subpart DDD does not define the various collection designs. As described by the preamble to the proposed rule, Roxul operates a vertical collection process [76 FR 72770, November 25, 2011].

There are no changes to applicability of NESHAP Subpart DDD based on the updates discussed in this application. The affected sources will continue to be subject to and show compliance with the emission limits in 40 CFR 63 Subpart DDD.

40 CFR 63, Subpart JJJJ: National Emission Standards for Hazardous Air Pollutants: Paper and Other Web Coating

40 CFR 63, Subpart JJJJ is a federal MACT that establishes emission standards for web coating lines and specifies compliance procedures for a facility with web coating lines that is a major source of HAPs. The ROXUL facility is a major source of HAPs.

There are no changes to applicability of NESHAP Subpart JJJJ based on the updates discussed in this application. Only the application of fleece binder material on the mineral wool line is subject to this regulation. ROCKWOOL will continue to comply with this regulation by using 'as-applied' compliant coatings pursuant to the procedures in §63.3370(a)(2). This limits the as-applied binder to a VOC content of 0.016 lbVOC/lb-binder. VOCs are allowed for use as a surrogate for organic HAP (OHAP) emissions per §63.3370(c)(1) and (2).

40 CFR 63, Subpart ZZZZ: National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

40 CFR 63, Subpart ZZZZ is a federal MACT that established national emission limitations and operating limitations for HAPs emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. As the RAN Facility is defined as a major source of HAPs, the facility is subject to applicable requirements of Subpart ZZZZ. Pursuant to §63.6590(c):

> *"An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part."*

As discussed above, the Emergency Fire Pump Engine complies with NSPS Subpart IIII.

40 CFR 63, Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Hazardous Air Pollutants Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

40 CFR 63, Subpart DDDDD is a federal MACT rule that establishes national emission limitations and work practice standards for HAPs emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAPs. The ROXUL facility will be a major source of HAPs.

Pursuant to §63.7485, Subpart DDDD applies to "an industrial, commercial, or institutional boiler or process heater as defined in §63.7575 that is located at, or is part of, a major source of HAPs." As noted, the RAN Facility is defined as a major source of HAPs. Based on the definition of "boiler" and "process heater," the PreHeat Burner (IMF24) and Natural Gas Boilers 1 and 2 (CM03 and CM04) are subject to Subpart DDDDD as new affected sources and are required to be in compliance with Boiler MACT. None of the units are, however, pursuant to §63.7500(e), subject to any emission standards: "Boilers and process heaters in the units designed to burn gas 1 fuels subcategory [includes natural gas] are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart." However, the units are subject to the applicable testing, analysis, initial compliance, notification, reporting, and record-keeping requirements §63.7500-§63.7560.

The only significant difference in applicability between the 2017 application and the current application is that the boiler size has been reduced from 5.1 mmbtu/hour each to 4.9 mmbtu/hr each. As a result of reducing the boiler sizes to under 5 mmbtu/hr, ROXUL will now be required to perform tune-ups on these boilers every 5 years, rather than biennially, in accordance with §63.7540.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that are emitted from the RAN Facility and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone,

Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

HAPS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. The following table lists the carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)) of each HAP identified by ROXUL as being emitted in substantive amounts (at least 0.01 pounds per hour or 0.01 tons per year):

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen
Methanol	VOC	No	No Assessment Available
n-Hexane	VOC	No	Inadequate Data
Phenol	VOC	No	Group D - Not Classifiable
HF[1]	Acid	No	Not Classifiable
HCl[1]	Acid	No	Not Classifiable
COS	VOC	No	Not Assessed
Fine Mineral Fibers[2]	PM	No	Not Classifiable

[1]No entry for substance in IRIS. Data comes from the CDC's Agency for Toxic Substances and Disease Registry.
[2]No entry for substance in IRIS. Data applies specifically to rockwool fibers and comes from the International Agency for Research on Cancer as cited at https://www.epa.gov/sites/default/files/2016-10/documents/fine-mineral-fibers.pdf

Sulfuric Acid Mist (H_2SO_4)

The compound of H_2SO_4 is regulated under 45CSR14 with a significance level that can trigger BACT for each source that contributes H_2SO_4 emissions. As discussed above, the RAN facility is no longer subject to 45SCR14. H_2SO_4 is not represented in the IRIS database and is not listed as a HAP. Concerning the carcinogenicity of sulfuric acid, the Agency for Toxic Substances and Disease Registry (ATSDR) states that "[t]he ability of sulfuric acid to cause cancer in laboratory animals has not been studied. The International Agency for Research on Cancer (IARC) has determined that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans. IARC has not classified pure sulfuric acid for its carcinogenic effects."

AIR QUALITY IMPACT ANALYSIS

Because, with this application, the facility is not "major" as defined in 45CSR14, no modeling was performed.

MONITORING OF OPERATIONS

The existing permit already contains extensive monitoring requirements for the existing source. The following details the changes to the monitoring, testing and recordkeeping in the existing permit:

* All monitoring, recordkeeping and testing related to coal has been removed since combustion of coal will not be permitted in the new permit.

* All monitoring, recordkeeping and testing related to the Rockfon Line has been removed since the Rockfon Line was not installed and will not be permitted in the new permit.

* All monitoring, recordkeeping and testing related to cooling towers has been removed since the cooling towers were not installed and will not be permitted in the new permit.

* All monitoring, recordkeeping and testing related to product marking has been removed since the P MARK system was not installed and will not be permitted in the new permit.

* Since the facility will no longer be a major source, all monitoring, recordkeeping and testing relating to CO_{2e} will be removed from the permit. This is because in 2014, under Utility Air Regulatory Group v. EPA, the Supreme Court of the US ruled that greenhouse gases from stationary sources can only be regulated if the source is major for an existing PSD pollutant. Since ROXUL will no longer be a major source under PSD, greenhouse gases are not a regulated pollutant.

* The periodic testing schedule in section 4.3 of the permit was changed to reflect the fact that the facility is no longer a PSD major source. The new schedule will require annual testing if a test result is greater than 90% of the applicable emission limit. Otherwise, testing every three years will be required.

CHANGES TO PERMIT R14-0037

The following changes were made to Permit R14-0037

* The permit was put into the most recent boilerplate, including the changes to conditions 2.11, 2.12 and the update to USEPAs mailing address.

* Table 1.0 was changed to remove all equipment that has not been installed at the facility, update sizes and capacities where needed and add the three new tanks.

* Since the facility will no longer be a major source under 45CSR14, all references to BACT were removed. It should be noted, however, that none of the required BACT technologies or actual limits were changed.

* Condition 4.1.1 was changed to add application R14-0037A.

* Condition 4.1.2 was changed to remove any mention of coal and any other emission point that is being removed from the permit. Additionally, emission limits were updated where necessary.

* Condition 4.1.3 was removed since it applies to sources associated with coal.

* Condition 4.1.4 was updated to reflect the new, lower emission limits (and the removal of the CO_{2e} emission limit).

* Condition 4.1.5 was updated to reflect the new emission limits.

* Condition 4.1.6 was changed to reflect the new, lower, emission limits. Additionally, the language of 4.1.6.b was changed to remove the references to BACT, while keeping the actual BACT limit.

* Condition 4.1.7 was removed due to the fact that the Rockfon Line was never installed and will not be permitted.

* Condition 4.1.8 was updated to reflect the new MDHI's and lower emission limits. And, again, the language was changed to remove the references to BACT, while keeping the actual BACT limit and the CO_{2e} limit was removed.

* Condition 4.1.9 was changed to reflect the new, lower, emission limits. Additionally, the language of 4.1.9 was changed to remove the references to BACT, while keeping or lowering the actual BACT limit. Additionally, Table 4.1.9(c) was updated to remove tanks that were not installed and change the capacity of tanks where required.

* Condition Condition 4.1.10 was updated to reflect the new HP and updated emission limits. And, again, the language was changed to remove the references to BACT, while keeping the actual BACT limit and the CO_{2e} limit was removed.

* Condition 4.1.11 was removed. Section 4.1.11.a (dry ice cleaning) emits only CO_{2e} (all CO_{2e} limits are being removed as explained above). Additionally sections 4.1.11.b and 4.1.11.c address sources that were not installed and will not be permitted.

* Condition 4.1.12.a was updated to reflect the current 45CSR13 citation.

* Condition 4.1.13 was updated to include permit application R14-0037A.

* Condition 4.2.5 was removed because it addresses the coal fluidized bed dryer which was not installed and will not be permitted.

* The language in condition 4.2.6 was updated to reflect the fact that the CEMs are already installed and operating.

* Condition 4.2.8 was removed because it addresses the Rockfon Line which was not installed and will not be permitted.

* Condition 4.2.10 was removed because it addresses the Cooling Towers which were not installed and will not be permitted.

* Condition 4.2.11 was removed because it addresses Product Marking operations which were not installed and will not be permitted.

* The reference to BACT was removed from condition 4.2.14.

* Condition 4.2.16 was removed because it refers CO_{2e} which is being removed from the permit as explained above.

* The language in condition 4.3.2 was changed to reflect the fact that the initial testing has already been performed. Additionally all requirements related to the Rockfon Line were removed since it was not installed and will not be permitted.

* The periodic testing schedule in section 4.3 of the permit was changed to reflect the fact that the facility is no longer a PSD major source. The new schedule will require annual testing if a test result is greater than 90% of the applicable emission limit. Otherwise, testing every three years will be required.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R14-0037A be granted to ROXUL USA, Inc.

Steven R. Pursley

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Engineer

August 31, 2023