New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E, 12th Floor
625 Broadway, Albany, New York 12233-7017
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Joe Martens
Commissioner

October 29, 2014

Mr. Thomas Van Vranken
Environmental Manager
Norlite LLC
628 So. Saratoga Street
Cohoes, New York 12047

RE: Minor Permit Modification of Hazardous Waste Management Permit
Norlite LLC, NYSDEC Permit No. 4-0103-16/16
EPA ID No. NYD080469935

Dear Mr. Van Vranken:

The New York State Department of Environmental Conservation (NYSDEC) has completed review and hereby partially approves the minor permit modification request dated October 28, 2014, to replace the existing multiclone units specified in the permit with a functionally equivelant 24" tube multiple cyclone unit (multiclone). This permit modification applies to Kiln 2, and does not cover replacement of the multiclone unit on Kiln 1 at this time.

This permit modification is based on your minor permit modification request dated March 25, 2014. This is a minor modification in accordance with Part 373.1-7(c)(1)(iii).

Please note the conditions of this permit modification request:

1. This permit modification will go into effect on December 8, 2014. If an earlier installation date is chosen, notification must be sent at least 1 week in advance.

2. The permittee will notify the Department once this new unit has been installed and is in use on Kiln 2.

Permit pages reflecting the changes from your requested modification include Attachment D Pages D-37 through D-42a and the addition of Page D-42b. Please replace these pages in your copy of the permit with the enclosed modified pages. Under 6 NYCRR Part 373-1.7(e), Norlite is required to notify all persons on the facility mailing list of the modification. Please provide this office a copy of your notification for our records.

If you have any questions, please contact me at (518) 402-9814.

Sincerely,

Thomas J. Killeen, P.E.
Chief, RCRA Permitting Section

Enclosure

ec: D. Gardell
D. Lates
J. Quinn, Region 4
J. Hadersbeck, Region 4
N. Baker, Region 4, DEP
A. Everett, USEPA, Region 2
W. Palomino, USEPA, Region 2

outside the operating window during a flame failure, a virgin fuel is fired to bring all operating parameters within the operating window prior to commencing LLGF feed.

D-5(c) Air Pollution Control System

Both kilns have nearly identical emission control systems. The systems include both wet and dry emission control devices for the collection and removal of particulate matter, metals, hydrogen chloride (HCl), and other gaseous species. The principal collection mechanisms employed by these devices are sedimentation, condensation, impaction, filtration and interception for particulates and metals, and absorption for HCl and other gaseous species.

Combustion gases and entrained particulates exiting Kiln 2 pass through a mechanical dust collector, a Processbarron (12) 24″tube multiple cyclone unit (multiclone) model no. 12AU2416CBK110-3X4, to remove large particulate matter. Combustion gases and entrained particulates exiting Kiln 1 pass through a mechanical dust collector, a Barron multiple cyclone unit (multiclone), to remove large particulate matter. Particulates removed by these devices accumulate in a hopper from which they are pneumatically conveyed to the Dust Storage Silos. Dust from these silos is beneficially used in a block mix product.

Gases exiting the multiclone then pass to an air cooler, a closed cycle air to air heat exchanger. Process gases enter the heat exchanger at approximately 900^{o}F and

exit at approximately 450°.

Following the heat exchanger, a three-module baghouse (fabric filter) is provided to remove fine particulates which are entrained in the gas. The baghouse is designed for operation on two modules while the third module is down for maintenance, however, hazardous waste is not fed unless all three modules are online. Hydrated lime ($Ca(OH)_2$) is continuously fed to the baghouse to enhance particulate removal and help control acid gases. Accumulated particulates and (partially) reacted lime is removed from the filter media by sequentially pulsing a small fraction of the filter bags at a time with compressed air. Particulates so removed accumulate in a hopper from which they are pneumatically conveyed to Dust Storage Silos. Like particulates removed from the multiclone, baghouse dust is beneficially used in a block mix product. A modulating damper located upstream of the baghouse automatically adjusts baghouse inlet gas temperatures (if required) to the range of 375°F to 400°F ($\pm$ 5°F) by tempering with ambient air.

Immediately downstream of the baghouse is an induced draft fan which draws tertiary combustion air through the kiln, multiclone, heat exchanger and baghouse and provides forced draft to exhaust combustion gases through the wet scrubbers and mist elimination units. Additionally, the fan provides induced draft for a hood installed over the kiln shale feed chute to capture any fugitive emissions emanating from this area.

Two wet scrubbers are provided to capture particulates and to remove acid gases which escape capture/removal in the baghouse. The first is a BECO Venturi (MMV) scrubber. This scrubber is of a rod design which utilizes stainless steel tubes installed in rows across the throat to provide a series of smaller throats. The intent is to provide the effect of a small venturi throat without incurring the high pressure drop typically associated with conventional high efficiency venturi scrubbers. Further, the tubes provide additional impaction surfaces for enhanced particulate and HCl collection.

Clean water atomization headers are located at the entrance of the scrubber to cool and saturate combustion gases. The scrubbing medium is a sodium carbonate (soda ash) solution which is introduced through nozzles located directly above the venturi module. This solution is recycled through the unit at approximately 200 gpm and, at equilibrium, contains approximately 10% dissolved solids consisting principally of sodium carbonate, sodium chloride and/or sodium sulfate. Scrubbing solution is also injected into the transition segment located immediately downstream of the venturi scrubber.

Excess water/scrubbing solution drains from the venturi exit elbow to a settling/recycle tank. The pH of the solution in the recycle tank is continuously monitored by a pH probe and automatically maintained at a pH of 7.9 or greater by the introduction of a 5% sodium carbonate solution. A portion of the recirculated solution is removed

(blown down) from the recycle pump discharge to maintain a stable solids concentration in the system. The blowdown rate ranges between 4 and 20 gpm, depending on the quantity of fuel burned as well as the chloride and sulfur contents.

The second scrubber is a (Ducon) polishing scrubber/mist eliminator. This unit consists of a bundle of tubular baffles which are designed to capture droplets of scrubber solution entrained in gases exiting the BECO scrubber. Additionally, a mesh-type mist eliminator is fitted at the top of the unit, immediately preceding the exhaust stack. The mist eliminator is kept clean by a water spray. Finally, scrubbed gases are exhausted to the atmosphere, 120 feet above grade, via a 48 inch diameter stack.

D-5(d) Waste Feed Cut-Offs (WFCOs)

Kiln process operations are controlled from a central control room by an operator who oversees a computer-based control system. In addition to routine fail-safe features, a series of waste feed cut-offs are programmed into the control system to assure that LLGF is only fed to the kiln under prescribed conditions. This ensures that wastes will be properly destroyed and exhaust gases suitably treated before discharge to the environment. Any deviation from prescribed conditions will result in immediate interruption, i.e., cut-off, of waste feed to the kiln. The following off-specification conditions will activate a WFCO:

* LLGF feed rate in excess of prescribed limit,
* Shale feed rate above prescribed limit,
* Combustion gas velocity, as measured by induced draft fan, current draw, above prescribed limit,
* Carbon monoxide concentration (at baghouse outlet) above prescribed limit:
* Baghouse inlet temperature above prescribed limit,
* Baghouse pressure drop below prescribed limit,
* Ducon scrubber pressure drop
* Venturi scrubber pressure drop
* Scrubber water recirculation flow rate below prescribed limit,
* Scrubber solution, minimum pH
* Loss of lime feed to baghouse, as measured by feeder motor current draw,
* Kiln pressure exceeds prescribed limits, and
* Kiln exit gas temperature below or above prescribed limit.

All of these WFCO conditions are shown on attached Drawings NY003-5006 and NY003-5001.

Changes to the programming or WFCO and alarm points require prior management and NYSDEC review and approval consistent with Norlite'S Standing Operating Procedure #5-011, "CONFIGURATION AND MAINTENANCE CONTROL PROCEDURES KILN CONTROL AND CONTINUOUS EMISSIONS MONITORING SYSTEMS".

D-5(e) REMOVED August 2002

D-5(f) Maintenance of Scrubber System and Baghouse System

The procedure for performing routine scrubber maintenance is provided in Norlite's Standard Operating Procedures #2-001, "-Preparation for and Performance of Routine Scrubber Maintenance - Draining and Cleaning Scrubber Internals".

Each kiln is equipped with a baghouse as described in Section D-5 (c). Bag leakage or failure is detected by a relative increase in suspended solids present in the scrubber water blow down process stream.

Baghouse maintenance can be done while the kiln is in operation or on a shutdown basis. The procedures are the same except that during a shutdown no fuel is fired or lightweight aggregate is produced and all three modules may be opened at one time.

Upon determination that baghouse maintenance is required, the kiln ceases operation on LLGF and commences firing a virgin fuel while continuing to produce light weight aggregate. Each of the three baghouse modules are checked individually via the clean air plenum of the baghouse. The inlet damper to a module is closed. The door to the clean air plenum is opened and an inspection of the tube sheet is conducted. A leaking or failed bag will show signs of dust buildup at the top of the bag and in the very near vicinity of the bag. Any suspected bag is removed and replaced with a new bag. When one module is complete, the

door is closed, the inlet damper is opened and the procedure is repeated for each module.

Upon completion of baghouse maintenance, and when the operating parameters are within the LLGF operating window, LLGF feed to the kiln commences.

D-5(g) Maintenance of Optical Flow Sensor for Stack Gas Flow Measurement

The Optical Flow Sensor will be inspected and cleaned weekly by the I&E Department personnel, even if the unit is operating within normal range. The routine cleaning maintenance is required to ensure the unit remains in operation without upset or malfunction.

The cleaning of the unit is simple but must be done while the Kiln is not burning LLGF. The cleaning of the unit must occur while the kiln is burning a virgin fuel such as natural gas or off-specification used oil at a minimum. Cleaning of the unit involves opening the unit head and wiping the lens off with a clean cloth. Since the lenses are made of high grade quartz, there is little risk of scratching the lenses.

The rest of the Optical Flow Sensor system is solid state and requires no maintenance. Should a failure occur in one of the three circuit boards in the unit, the I&E Department has been trained to be able to troubleshoot which board is damaged and replace it with a spare board kept on-site.

A malfunction of the unit, caused by either dirty

lenses or damaged circuit boards, will trigger the PLC to trigger an AWFCO and cause the kiln to come off of LLGF. The AWFCO valve will not open again until the Optical Flow Sensor fault has been cleared.