Air Quality Bureau's Responses to Comments Received on 8/8/17 from EPA Regarding Modeling Demonstration for Lhoist's Belen Lime Plant in Furtherance of the 110(l) Demonstration Required for Repeal of 20.2.20 NMAC, *Lime Manufacturing Plants – Particulate Matter*.

1. There appear to be some differences between the parameters used for the modeling demonstration submitted to EPA in 2015 (conducted by Trinity Consultants in 2000), versus the modeling demonstration submitted on 3/21/17 (conducted by AQB in 2016-2017). Specifically: a). Stack No. DC-010 is no longer included; and b). Stack No. DC-007 now modeled as a vertical stack instead of horizontal.

AQB Response:

a). Baghouse DC-010 (Unit # 610) / Stack 10 was not in the original design submitted for NSR Permit 1652, issued 11/8/1995 (see attached summary of permit history). The plan to add a tenth baghouse and exhaust stack was detailed in a construction permit application submitted to the AQB in 2000 (NSR 1652-M2, issued 10/2/00), but they were never built. This was confirmed by AQB Inspector George Llewellyn during an inspection conducted on 9/1/04. Dr. Thanukos of Applied Environmental Consultants, Inc. (consultant to Lhoist), confirmed in a 10/06/08 email to Lisa Killion (AQB) that Dust Collector DC-010 / Unit #610 and associated Fan FN-010 / Unit #611 were never constructed. Dr. Thanukos attested that "the equipment that was not constructed does not affect emissions." He sought to confirm that correction of the air quality permit to reflect the actual processes (i.e., removing a control device that had not and would not be built) could be accomplished via an Administrative Permit Revision per 20.2. 72.219.A(1)(d) NMAC rather than a Technical Permit Revision under 20.2.72.219.B NMAC. In addition, Dr. Thanukos stated that although the equipment that was not constructed was to have processed a material classified as a toxic air pollutant, deletion of the equipment would not result in a new emission unit or an increase in emissions of the pollutant. An Administrative Revision was not submitted at that time.

The AQB concurs with Dr. Thanukos assessment that the absence of Baghouse DC-010 (Unit #610) / Stack 10 would not increase the facility's potential to emit: Baghouse DC-010 (#610) was originally intended to control process emissions from a proposed Loadout Spout LS-004 (Unit #551) and Truck Loading (Unit #552). This Loadout Spout LS-004 (#551) was never constructed, but its emissions were taken into consideration by Trinity Consultants when they conducted the modeling analysis for modification M2 (Permit #1652-M2). Process emissions from Truck Loading (#552) are instead controlled by baghouse DC-008 (Unit #548) by way of the existing Loadout Spout LS-003 (Unit #546). In the current modeling demonstration conducted by the AQB, the emissions from Truck Loading (#552) that are collected by DC-008 (#548) were considered, and Lhoist is still subject to a permit emissions limit for DC-008 (#548) of 0.1 lb/hr or 0.413 TPY of PM, with which they must comply. Therefore, even if Lhoist constructs Loadout Spout LS-004 (#551) in the future, it would still be subject to the same emissions limit, or would need to conduct dispersion modeling to demonstrate compliance with the NAAQS if there is a request to increase the permit limit. Therefore, Baghouse DC-010 (#610) is not required for compliance with the permit limits or NAAQS, as demonstrated by the updated modeling demonstration performed by the AQB which modeled the process units and associated control equipment that were actually constructed (i.e., nine baghouses / stacks); and this modeling shows compliance by Lhoist with their permitted limits and the NAAQS.

At the behest of the AQB, Lhoist has submitted an Administrative Permit Revision to remove any reference to Baghouse DC-010 (#610) / Stack 10.

b). Stack No. DC-007, was modeled as horizontal by Trinity in 2000, and this was confirmed by AQB's site visit. However, AQB used a default value in the modeling run previously submitted to EPA, which assumed a vertical stack. AQB has rerun the model using a horizontal orientation. Please see the Revised Modeling Report (9/29/17).

2. Original permit was issued prior to the promulgation of the $PM_{2.5}$ NAAQS. What is the basis for currently modeled $PM_{2.5}$ emission rates? (e.g., source, calculations).

AQB Response:

$PM_{2.5}$ emission rates were based on the emission factor provided by Paul Oruoch, P.E., Managing Consultant at Trinity, contracted by Lhoist (see attached 12/13/16 e-mail from Trinity and associated Excel worksheet). AQB has accepted this value and how it was calculated. He was unable to find $PM_{2.5}$ / PM_{10} particulate size distribution data specific to a lime hydrating terminal emission source. Thus, he used the guidance in AP-42 Appendix B.2 and calculated a $PM_{2.5}$ / PM_{10} ratio of 0.52 for baghouses associated with lime operations that do not include combustion using the parameters and calculation steps shown in his e-mail.

3. Were nearby/offsite source inventories included in modeling analysis?

AQB Response:

Yes, please see the Revised Modeling Report (9/29/17) for details.

Permitting History of Lhoist Lime Hydrating Plant in Belen in Regard to Nonexistent Baghouse/Stack #10. 1/12/18.

Air Quality Permit No. **1652**. 11/8/95. 20 TPH lime hydrator. **Seven** baghouses and stacks constructed: Baghouse#/Fan#/Stack #: 505/506/DC1; 598/599/DC2; 542/544/DC3; 522/524/DC4; 534/536/DC5; 558/560/DC6; 548/550/DC8. No indication of baghouse/stack #10.

Permit change. 3/24/95. Addition of enclosed belt between 500-ton silo and rail loading spout; production decrease to 1000 tpd. No mention of DC10 or Unit #610.

Inspection. 12/1/97. Inspector John Volkerding. No violations were issued.

1652 M1, 12/30/98. Significant revision. Modification to equipment list and increase in production to total 25 TPH lime hydrator. New baghouse DC-007 Unit #565 / Fan FN-007 Unit # 566 (aka stack DC7) ducted to Bucket Elevator BE-004 Unit #539; 500 Ton Bin BN-003 Unit #540 for a total of **eight** stacks.

M1-R1, Administrative Permit Revision, 6/21/99. Altering crusher location, no emission changes.

M1-R2, Technical Permit Revision, 9/10/99. to add a by-pass screw conveyor (SC-006 Unit# 570) used to divert lime from the dynamic separator to crusher #503 A Enable the addition of gypsum to process stream. {SC-006 #570 never constructed}

10/25/99, e-mail from Norman Tupper (CLC) to Stacy Carr (Trinity Consultants), re: Stack elevations at the Belen Plant, showing nine baghouse/stacks.

M1-R3, Technical Permit Revision, 11/2/99. New lime sifter (Unit #571), the emissions of which are ducted to baghouse DC-005 Unit #534 / FN-005 #536. Sifter removed in 2000.

12/10/99, fax from Stacy Carr (Trinity Consultants) to Loren Bowe (CLC), showing nine baghouse/stack being modeled.

1652-M2. Technical Permit Revision. Permit issued on 10/2/00 (5/19/00?), and is the **currently active permit**. New equipment authorized by this permit modification includes Baghouse #610. Application submitted on 1/14/00 ruled administratively incomplete on 1/18/00. Trinity Consultant's response to request for information (1/18/00) submitted on 1/25/00, in furtherance of permit application and NOI (universal [general] construction or modify). Actual stack parameters are listed in "Table B-1. Actual Stack Parameters" (p. B-3), which lists "Unit# 610 - Dust Collector # DC-010". Modeled stack parameters are listed in "Table B-2. ISCST3 Modeled Stack Parameters" (p. B-4), which lists "Unit# 610 – DC-010". "Table B-3. Emission Units and Corresponding Controlled Processes" (p. B-5), illustrates the processes controlled by each emission unit, and lists "Dust Collector Unit #610" and corresponding "Process/Unit#" for "Loadout Spout (551) and Truck (552), which were planned to be ducted to #610. (Emissions from ducted units may go to more than one baghouse, but compliance with the specified emissions limits is required). Application also lists "Source/ID 610 [DC-010]" under "Point Sources" in the "Emission and Stack Parameter Summary", on page B-15.

AQB Modeling Summary, 3/1/00, "Table 1. Table of Emissions and Stack Parameters", lists "Stack Number DC010" (Pulse Jet Baghouse). Values seem to be patterned after DC6.

1652-M2-R1. Denial of Administrative Revision. Facility Withdrew. 5/24/01.

1652-M2-R2 Technical Permit Revision. 8/22/01; add Pneumatic Car Boot BL-002 (Unit#501a) to equipment regulated by the permit; include Unit #501a as a unit ducted to baghouse DC-001 Unit #505; and to receive lime from either Pneumatic Car Boot BL-001 Unit #501 or 501a (railcar boots), but not both at same time.

Inspection. 9/1/04. AQB Inspector George Llewellyn documented that **Baghouse #610 and associated process equipment** (Loadout Spout LS-004 #551 & Fan FN 010 #611) **were never installed**. (i.e. stack #10).

NOV. 12/14/04. Insufficient record keeping regarding pressure drop across baghouse #565 DC-007; and installing baghouses with a different manufacturer from that listed in permit. Chemical Lime had substituted baghouses #548 DC-008 (controlling emissions from truck loadout [i.e. Loadout Spout LS-003 #546 & Truck #552]) and #558 DC-006 (controlling emissions from railcar loadout [i.e. Railcar #557 & LS-002 #556]) from Midwest International MV-75-3's (allowed by Permit 1652M2) with PEBCO 1-DC-175's. Chemical Lime never installed the Midwest International baghouses. The PEBCO baghouses were installed when the plant was constructed on 4/15/96.

1652 M2-R3, Administrative (Technical?) Permit Revision, 4/1/05, Denied. Facility did not qualify for an administrative revision.

1652 M2-R4, Technical Permit Revision, 7/29/05. This modification consists of an equipment exchange of two dust collectors DC-008 #548 and DC-006 #558 that control emissions from the truck (Unit 552) and railcar (Unit 557) loadout facilities. Chemical Lime Co. had installed two Pebco I-DC-175 dust collectors instead of the two Midwest International MV-75-3 dust collectors listed in the original permit. This correction resulted in a decrease in emissions from this source. Unit 610 – Baghouse, ducted to Units #551 and #552, is listed in table under "Condition 2" "Emission Rates". Pursuant to 20.2.75.11 NMAC, the Department will assess an annual fee for this facility.

1652 M2-R5, 3/17/08, Denied.

10/6/08. e-mail from Louis Thanukos of Applied Environmental Consultants, Inc. to Lisa Killion, AQB, confirming that Dust Collector / DC-010 / 610 and Fan / FN-010 / 611 were never constructed. Dr. Thanukos attests that "the equipment that was not constructed does not affect emissions." And is seeking ". . .clarification on whether correction of the air quality permit to reflect the actual processes can be done under an Administrative Amendment under 20.2. 72.219.A(1)(d) NMAC [Incorporate a change in the permit solely involving the deletion from the permit of a source or sources upon notification of the department that the source or sources have not been and will not be built]; rather than a technical revision under 20.2.72.219.B. Although the equipment that was not constructed was to have processed a material classified as a toxic air pollutant, deletion of the equipment will not result in a new emission unit or an increase in emissions of the pollutant."

1652 M2-R6, 2/23/12, Administrative Permit Revision, name change.

2017. NSR Annual Fees paid in full.

1652 M2-R7, 12/26/17, Administrative Permit Revision, remove Dust Collector DC-010 Unit # 610 and associated Fan FN-010 Unit # 611 from equipment list.

From:	BARRY Ed
To:	Butt, Neal, NMENV
Cc:	Mustafa, Sufi A., NMENV; SOFFEL Travis; SCHOLL Chris
Subject:	FW: PM2.5 / PM 10 ratio for LNA terminal in Belen New Mexico
Date:	Tuesday, December 13, 2016 3:55:09 PM
Attachments:	PM2.5 to PM10 ratio-v0.0.xlsx

Neal,

This is what my consultant could fine on PM2.5 for lime and some support calculations. If you do not find something here that can help you resolve the issue, would it be possible for us to get a copy of the model for our review?

Ed

Ed Barry
Western Environmental Manager
Lhoist North America
Cell 602-321-6752

From: Paul Oruoch [mailto:POruoch@trinityconsultants.com]
Sent: Tuesday, December 13, 2016 3:27 PM
To: BARRY Ed
Subject: PM2.5 / PM 10 ratio for LNA terminal in Belen New Mexico

Good afternoon Ed,

I was unsuccessful in finding PM2.5 / PM10 particulate size distribution data specific to a lime hydrating terminal emission sources. Thus, I used the guidance in AP-42 Appendix B.2 and calculated a $PM_{2.5}$ / PM_{10} ratio of 0.52 for baghouses associated with lime operations that do not include combustion using the parameters and calculation steps below. Also attached is a workbook containing the calculation steps:

Parameters used for calculation

Parameter description	Parameter ID	Parameter value	Source of parameter
Cumulative controlled PM_{10} grain loading	CCPM10GL	0.01 gr/dscf	This is an engineering estimate
Size specific cumulative control efficiency for particle size 6 – 10 µm	SSCCPM610	99.5%	AP-42 Table B.2-3
Size specific			AP-42 Table

cumulative control efficiency for particle size 2.5 – 6 µm	SSCCPM256	99.5%	B.2-3
Size specific cumulative control efficiency for particle size <2.5 µm	SSCCPM25	99.0%	AP-42 Table B.2-3
AP-42 Category 4 (Mechanically Generated; Processed ores and nonmetallic minerals) particle size 2.5 µm cumulative %	C4PM25C	30%	AP-42 Table B.2.2, Category 4 (Page B.2-14)
AP-42 Category 4 (Mechanically Generated; Processed ores and nonmetallic minerals) particle size 6 µm cumulative %	C4PM6C	62%	AP-42 Table B.2.2, Category 4 (Page B.2-14)
AP-42 Category 4 (Mechanically Generated; Processed ores and nonmetallic minerals) particle size 10 µm cumulative %	C4PM10C	85%	AP-42 Table B.2.2, Category 4 (Page B.2-14)

Calculation steps

1. Calculate the individual and total size specific percentages for the following particle categories: <2.5 µm [SSC4PM25], 2.5 – 6 µm [SSC4PM256] and 6 – 10 µm [SSC4PM610]:
   [SSC4PM25] = [C4PM25C] = 30%
   [SSC4PM256] = [C4PM6C] - [C4PM25C] = 32%
   [SSC4PM610] = [C4PM10C] – [C4PM6C] = 23%
   Total size percentages [SSC4PM25610] = [SSC4PM25] + [SSC4PM256] + [SSC4PM610] = 85%

2. Calculate the cumulative PM_{10} control efficiency [CPM10CE]:
   [CPM10CE] = (([SSC4PM25] /[SSC4PM25610]) x [SSCCPM25]) + (([SSC4PM256] /[SSC4PM25610]) x [SSCCPM256]) + (([SSC4PM610] /[SSC4PM25610]) x [SSCCPM610]) = 99.32%

3. Calculate the uncontrolled cumulative $PM_{2.5}$ / PM_{10} ratio [PM2510R] ratio:
   [PM2510R] = [C4PM25C] / [C4PM10C] = 0.353

4. Calculate the uncontrolled cumulative PM_{10} grain loading [UCPM10GL]:
   [UCPM10GL] = [CCPM10GL] / (1 – [CPM10CE]) = 2.00 gr/dscf

5. Calculate the uncontrolled cumulative PM2.5 loading [UCPM25GL]:
   [UCPM25GL] = [UPM10GL] x [PM2510R] = 0.71 gr/dscf

6. Calculate the uncontrolled size specific grain loading for PM <2.5 µm [USSPM25GL]:
   [USSPM25GL] = [UCPM25GL] = 0.71 gr/dscf

7. Calculate the controlled size specific grain loading for PM <2.5 µm [CSSPM25GL]:
   [CSSPM25GL] = [USSPM25GL] x (1 – [SSCCPM25]) = 0.006 gr/dscf

8. Calculate the cumulative controlled grain loading for $PM_{2.5}$ [CCPM25GL]:
   [CCPM25GL] = [CSSPM25GL] = 0.006 gr/dscf

9. Calculate the PM2.5 / PM10 ratio [PM10PM25R]:
   [PM10PM25R] = [CCPM25GL] / [CCPM10GL] = 0.52

Let me know if you have any questions. Thanks.

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Controlled PM10 loading	0.01	g/dscf
Cumulative PM10 control	99.32%	
Particle size 6 - 10 µm control efficiency	99.50%	
Particle size 2.5 - 6 µm control efficiency	99.50%	
Particle size 0 - 2.5 µm control efficiency	99.00%	
Uncontrolled PM2.5 / PM10 Ratio	0.35	Category 4
Uncontrolled cumulative PM10 loading	1.48	
Uncontrolled cumulative PM2.5 loading	0.52	
Uncontrolled size specific PM2.5 loading	0.52	
Controlled size specific PM2.5 loading	0.005	
Controlled cumulative PM2.5 loading	0.005	
Controlled PM2.5 / PM10 ratio	0.52	

Particle size	Size Percentage	Ratio	CE component
<2.5	30	0.353	0.35
2.5-6	32	0.376	0.37
6-10	23	0.271	0.27
	85.000	1.000	0.993