BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson John Gioia and Members of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: August 30, 2012

Re: Bureau of State Audits Report on the Metropolitan Transportation Commission Acquisition of 390 Main Street

RECOMMENDED ACTION

None; receive and file.

DISCUSSION

The Bureau of State Audits conducted an audit of the use of toll funds to acquire 390 Main Street in San Francisco. The audit involved the Metropolitan Transportation Commission (MTC) and the Bay Area Air Quality Management District (Air District). On July 24, 2012, the Air District received the confidential redacted version of the report pertinent only to the Air District. The redacted report contained only factual statements, with no recommendations. The Air District had no substantive response on the redacted report. On August 28, 2012, the full report was released concluding that the use of toll funds "is likely legal."

Air District staff will provide an overview of the results of the report.

BUDGET CONSIDERATION/FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Jeffrey McKay

Attachment

CALIFORNIA STATE AUDITOR

Metropolitan Transportation Commission

The Use of Toll Revenues to Purchase a New Headquarters Building Is Likely Legal, but the Transaction Exposes Toll Payers to Undisclosed Financial Risk

August 2012 Report 2011-127

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Elaine M. Howle
State Auditor
Doug Cordiner
Chief Deputy

CALIFORNIA STATE AUDITOR
Bureau of State Audits

555 Capitol Mall, Suite 300 Sacramento, CA 95814 916.445.0255 916.327.0019 fax www.auditor.ca.gov

August 28, 2012 2011-127

The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

As requested by the Joint Legislative Audit Committee, the California State Auditor presents this audit report concerning the acquisition of a new headquarters building for the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority). The audit also examined the toll authority's administration of toll bridge revenues, particularly the use of toll revenues for acquiring the headquarters building.

This report concludes that the decision the board governing the toll authority made to use toll revenues to fund the acquisition of a new headquarters building likely was legally permissible. However, a court would ultimately decide the legality of the purchase. Further, during the decision-making process the transportation commission and the toll authority could have done more to clearly articulate to both their shared governing board and the public the financial risks associated with purchasing the building. Specifically, the transportation commission's presentation to the board in September 2011 stated that toll payers are protected because the cash flows from the building would repay contributed toll revenues. However, in its projection the transportation commission did not discount the value of future cash flows to today's dollars. We converted the cash-flow projection and determined that, in the most conservative combination of rental and occupancy rates, cash flows would fall short of repaying contributed toll revenues by $30 million. We also noted that the financial risk of being unable to repay all of the toll revenues significantly increased in May 2012 when the Bay Area Headquarters Authority announced plans to convert 101,000 square feet of the building into an atrium and building support space that will reduce rentable space available to generate income. According to the current occupancy plan, unless the three most optimistic combinations of rental and occupancy rates are used, cash flows will fall short of repaying contributed toll revenues by a range of $1.5 million to $53.7 million over 30 years.

The transportation commission developed property search criteria and followed a reasonable process for evaluating potential properties, but at 350,000 square feet, the specified criteria for the overall building size was roughly twice the amount originally shared with its governing board. Moreover, it is not clear to us what the transportation commission's motivation was in setting the search criteria for the building's size—planning for growth or generating income. Notwithstanding the building's size, the governing board was well informed about the transaction and was responsive to public comment. Moreover, the Bay Area Air Quality Management District (air district) has signed a lease for space in the headquarters building with an option to buy. The transportation commission, toll authority, and the air district plan to move in to the headquarters building in fall 2013. Meanwhile, the transportation commission and the air district still need to resolve their options for disposing of their current headquarters buildings.

Respectfully submitted,

Elaine M. Howle

ELAINE M. HOWLE, CPA
State Auditor

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Contents

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Summary

Results in Brief

In October 2011 the Bay Area Headquarters Authority (headquarters authority)—an entity created by the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority)—purchased a building located at 390 Main Street in downtown San Francisco, using revenues from seven state-owned toll bridges in the San Francisco Bay Area (Bay Area). The building purchase was the culmination of nearly two years of planning among the transportation commission, the toll authority, the Bay Area Air Quality Management District (air district), and the Association of Bay Area Governments (association) to colocate, and the site is intended to serve as their regional headquarters. The transportation commission and toll authority share the same governing board (board), which has authorized the toll authority to contribute more than $167 million in toll revenues toward the estimated $180 million cost to purchase, renovate, and prepare the building for occupancy by fall 2013.

The board's September 2011 decision to authorize the purchase of a new headquarters building has been controversial. At a board meeting in September 2011, members of the public questioned why public toll revenues were being used to purchase a building that is larger than the amount of office space the colocating agencies need, effectively causing the toll authority, using public toll revenues, to enter the real estate business and become a commercial landlord. Others have questioned whether it was even permissible for the toll authority to use toll revenues for this purpose.

Although a court would ultimately decide the legality of the purchase, our legal counsel advised that the board's decision to use toll revenues to acquire a new headquarters building likely was legally permissible. State law expressly authorizes the toll authority to pay its direct and administrative costs from gross annual bridge revenues and to contribute funding to the transportation commission. Therefore, our legal counsel advised that a court would likely conclude that costs to plan for, acquire, and develop facilities and office space for the toll authority and transportation commission and its staff are direct costs that can be paid from gross annual bridge revenues. Our legal counsel also advised that a court would likely conclude that the sole fact that the building exceeds the needs of the toll authority and transportation commission would not adversely affect that authority, because a court would defer to reasonable decisions made by the board, and our legal counsel believes a court would likely find that the board's decision was reasonable. Ultimately, we note that under state law, the toll

Audit Highlights . . .

Our audit of the Bay Area Headquarters Authority's acquisition of a new regional headquarters and the Bay Area Toll Authority's (toll authority) administration and use of toll bridge revenues, revealed the following:

- *Using toll revenues to acquire a new headquarters building likely was legally permissible.*
- *The Metropolitan Transportation Commission (transportation commission) and the toll authority could have done more to clearly articulate to both their board and the public the financial risks.*
  - *In today's dollars, the transportation commission's expected cash flows would fall short of repaying contributed toll revenues by roughly $30 million.*
- *The financial risk of repaying toll funds increased following plans in May 2012 to reduce the building's rentable space.*
- *The transportation commission and the Bay Area Air Quality Management District (air district) had valid reasons for wanting to leave their current facilities.*
  - *The transportation commission stated that it wanted to ensure sufficient room for growth over the long term.*
  - *The air district faced spending between $12 million and $30 million to fix its aging building.*
- *The specified criterion for overall building size, at 350,000 square feet, was roughly twice the amount originally shared with the board.*
  - *The transportation commission's space needs were based on anticipated future responsibilities the specifics of which are unknown.*

authority may do all that is necessary or convenient to exercise its powers, including, but not limited to, the acquisition, management, and operation of any public facility or improvements.

During the decision-making process, the transportation commission and the toll authority could have done more to clearly articulate to both their board and the public the financial risks associated with purchasing the building. The transportation commission's presentation to the board in September 2011 stated that toll payers were protected because the projected net income, or cash flows, from the building would offset contributed toll revenues. However, in its projection the transportation commission did not discount the value of the future cash flows from the rental income, thus preventing a comparison of the expected toll fund contributions to the building's expected income in today's dollars. We converted the transportation commission's cash-flow projection based on its September 2011 space plan to today's dollars and determined that, in the most conservative combination of rental and occupancy rates, cash flows would fall short of repaying contributed toll revenues by a total of roughly $30 million. The income the building generates is largely dependent on the rental and occupancy rates that can be achieved. The future values of these rates are uncertain, and thus there is uncertainty as to whether and when toll revenues will be repaid.

We also note that the financial risk of being unable to repay all of the toll revenues significantly increased following the board's September 2011 decision to acquire the building. In May 2012 the headquarters authority announced plans to convert 101,000 square feet of space in the new headquarters into an atrium and building support space that will reduce the rentable space available to generate income. According to the current occupancy plan, unless the three most optimistic combinations of rental and occupancy rates are used, cash flows will fall short of repaying contributed toll revenues by a range of $1.5 million to $53.7 million over 30 years.

We found that the transportation commission and the air district had valid reasons for wanting to leave their current facilities. Both identified limitations with their current facilities, and both identified the potential benefits of easier cross-agency collaboration by sharing a new headquarters building. The transportation commission determined that it needed more space to accommodate its staff count as well as for conference rooms, storage space, and other support functions. The air district's justification for moving is largely based on the cost of improving its current headquarters. In recent years consultants have concluded that the air district faced spending between $12 million and $30 million to replace key components of its aging building. In January 2010 the

transportation commission, the air district, and the association began to explore the potential benefits of colocating into a single headquarters facility.

The transportation commission developed property search criteria and followed a reasonable process for evaluating potential properties based on these criteria. However, the specified criterion for overall building size, at 350,000 square feet, was roughly twice the amount originally shared with the board in November 2010. Moreover, it is not clear to us what the transportation commission's motivation was in setting this search criterion for the building's size. According to the transportation commission's executive director, he wanted to ensure that the new headquarters building has sufficient room for growth over the long term, and he also stated that income generation was not a factor when deciding on the amount of needed space. The transportation commission's chief financial officer further explained that the projected space needs were finalized in undocumented internal discussions about anticipated future projects that would affect the need for more work space. However, when asked about these projects, the chief financial officer explained it was a guess based on assumptions regarding the transportation commission's future responsibilities, the specifics of which are yet to be determined.

Once the search criteria were finalized, the transportation commission's broker solicited property proposals and made recommendations to the transportation commission regarding which proposals warranted further consideration. The transportation commission and its broker identified five finalist properties and ultimately selected the property at 390 Main Street in San Francisco, since the others had certain flaws and the 390 Main Street property had the lowest price per square foot. Since price per square foot was a key consideration in the selection process, we reviewed the five finalist property proposals and found that the price information submitted to the board for decision making was consistently developed by the transportation commission's broker.

Finally, the air district has signed a 30-year lease agreement with the headquarters authority to acquire approximately 62,500 square feet of work space in the new headquarters building. The lease agreement provides the air district with an opportunity to purchase its share of the building at any time over this 30-year period. The association and the San Francisco Bay Area Conservation and Development Commission have also demonstrated interest in relocating to the new building, having participated in space-planning meetings as recently as April 2012, but they have

not executed leases. In the summer of 2012, both the transportation commission and the air district plan to begin assessing their options for disposing of their current headquarters buildings.

Recommendation

If the Legislature believes state law provides the toll authority with too much discretion over its use of toll revenues, it should consider amending state law to more narrowly define how toll revenues that are not immediately needed for bridge maintenance or debt service may be spent or invested. For example, the Legislature might consider imposing specific limitations or prohibitions on the use of toll revenues to acquire real estate for administrative or investment purposes.

Agency Comments

The transportation commission agreed with certain conclusions in our report and disagreed with others, including the report's recommendations. Specifically, the transportation commission stated that it was pleased with the report's conclusion that a court would likely find its board's decision to purchase a new building with toll revenue was within its legal authority. The transportation commission was also pleased that our report found that its board was generally informed throughout the property search and selection process. However, the transportation commission disagreed with our report's net present value (NPV) analysis. In its view, the report's NPV analysis was incomplete because it did not include the building's residual value. Finally, the transportation commission expressed that it did not believe the recommendations to the Legislature were supported by the audit's findings.

The air district stated that it reviewed the portions of the report it was provided and did not have substantive comments.

Introduction

Background

In October 2011 the Bay Area Headquarters Authority (headquarters authority)—a joint powers authority created by the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority)—purchased a building with revenues from seven state-owned toll bridges in the San Francisco Bay Area (Bay Area). The building purchase was the culmination of nearly two years of planning among the transportation commission, the toll authority, the Bay Area Air Quality Management District (air district), and the Association of Bay Area Governments (association) to colocate, and the building is intended to serve as their regional headquarters. The transportation commission and toll authority share the same governing board (board), which has authorized the toll authority to contribute more than $167 million in toll revenues toward the estimated $180 million cost to purchase, renovate, and prepare the building for occupancy by fall 2013. Figure 1 on page 8 provides the timeline of significant decisions and events leading up to the purchase of the building, a property located at 390 Main Street in San Francisco.

The Transportation Commission's Role and Responsibilities

The transportation commission is the comprehensive transportation planning agency for the Bay Area. It is responsible for developing and updating the regional transportation plan, a comprehensive blueprint for mass transit, the state and federal highway systems, and the transbay bridges. In addition, the transportation commission is required to work collaboratively with other regional agencies on Bay Area land use, transportation, and air quality issues.[1] A 19-member board appointed by various state, local, and federal officials governs the transportation commission. At its headquarters in Oakland, California, an executive director, two deputy directors, a chief financial officer, and a general counsel make up the transportation commission's key executive management who carry out the day-to-day administration of the transportation commission and the management of its employees.

[1] The requirement for cross-agency collaboration is contained in California Government Code, sections 66536 through 66536.2, which establish the air district and the San Francisco Bay Conservation and Development Commission as members of the Joint Policy Committee that was previously established by the transportation commission and the association. The Joint Policy Committee is responsible for coordinating the development and drafting of major planning documents by its member agencies, such as regional plans for transportation, housing, and air quality.

The Toll Authority's Role and Responsibilities

The toll authority manages and administers toll revenues from seven state-owned toll bridges in the Bay Area; the text box lists these bridges. Although state law established the toll authority as a legal entity separate from the transportation commission, it also requires that the two be governed by the same board. Moreover, the toll authority is part of the transportation commission's operations and is administered by the transportation commission's key executive management.[2] During May 2012 the transportation commission and the toll authority collectively had approximately 177 authorized positions; however, according to the director of administrative and technology services, with interns and temporary staff, the head count exceeds 230. The toll authority is located with the transportation commission's offices in Oakland, California.

The San Francisco Bay Area's Seven State-Owned Toll Bridges

According to state law, the Bay Area Toll Authority uses toll revenue collected from the following state-owned bridges:

- Antioch Bridge
- Benicia-Martinez Bridge
- Carquinez Bridges
- Dumbarton Bridge
- Richmond–San Rafael Bridge
- San Mateo–Hayward Bridge
- San Francisco–Oakland Bay Bridge

Source: California Streets and Highways Code.

State law requires that tolls collected from state-owned bridges be used for specific purposes, such as to pay the costs for bridge construction, maintenance, and seismic retrofit projects. Furthermore, state law authorizes the toll authority to issue bonds—to be repaid with toll revenues—for these purposes. As noted in the transportation commission's financial statements, for the fiscal year ending June 30, 2011, the toll authority had approximately $7.9 billion in revenue bonds outstanding and had collected more than $597 million in bridge tolls.

The toll authority increased bridge toll rates effective July 1, 2010. The text box describes some of the purposes for which the toll authority may increase toll rates. The reasons the toll authority cited for the most recent toll rate increase were to cope with declining traffic volumes and higher-than-projected debt and operating costs. The toll authority did not cite its plans to fund the purchase of a new headquarters building as justification for its toll increase. In fact, the July 2010 increase was studied, proposed, and approved before October 2010, when a consultant to the transportation commission recommended that it colocate with other public agencies. Our review of the toll authority's accounting structure, and discussions with its deputy financial officer, indicate that toll revenues resulting from the 2010 increase are consolidated with other toll revenues.

[2] Throughout this report we use the term *transportation commission* to include both the transportation commission and the toll authority, unless otherwise specified.

As a result, our audit could not assess whether the toll revenues generated specifically from this increase were used to purchase the new headquarters building.

Allowable Reasons for Increasing the Bridge Toll Rates

According to state law, the Bay Area Toll Authority may increase bridge toll rates to provide funding for reasons including:

- To plan, design, construct, operate, maintain, repair, replace, rehabilitate, and seismically retrofit the seven state-owned toll bridges.
- To meet the requirements of voter-approved regional measures.
- To meet obligations and covenants under any bond resolution or indenture for bonds it issued.

Source: California Streets and Highways Code.

The Purpose of the Headquarters Authority

The headquarters authority is a joint powers authority created in September 2011 to plan, acquire, and develop office space for the transportation commission and the toll authority. State law expressly authorizes two or more public agencies to jointly exercise any power common to them by forming a joint powers authority. As a separate legal entity, the headquarters authority is authorized to enter into contracts, hire employees, incur debts, and sue and be sued in its own name.

In October 2011 the headquarters authority purchased a building located at 390 Main Street in San Francisco. According to the transportation commission's general counsel—who also serves as the headquarters authority's general counsel—a primary advantage to forming the headquarters authority is that it protects the assets and revenues of the transportation commission and the toll authority from building-related liabilities. In addition, the general counsel stated that the California Government Code includes well-developed and detailed operating rules for entities such as the headquarters authority. The code also includes helpful provisions regarding governance and auditing.

The Timeline Leading to the Purchase of a Regional Headquarters Building

The transportation commission, the air district, and the association spent nearly two years planning their colocation into a regional headquarters building. As was noted previously, the transportation commission must collaborate with other regional agencies, including the air district and the association. The air district serves as the Bay Area's regional air pollution control agency and is governed by a 22-member board of directors consisting of members appointed from each of the Bay Area counties. It is headquartered in San Francisco. The association is the regional planning agency that provides and coordinates programs to address the Bay Area's economic, social, and environmental challenges. It is currently located in Oakland in the same building as the transportation commission. In January 2010 the three agencies began to collectively explore their options for relocating together to a

new headquarters building. Figure 1 provides the timeline leading up to the purchase of the regional headquarters building and describes how the air district and association participated in the property search process.

Figure 1
Regional Headquarters Building Purchase Timeline

Sources: California State Auditor's analysis of documents the transportation commission and the air district provided.

Scope and Methodology

The Joint Legislative Audit Committee (audit committee) directed the California State Auditor to perform an audit of the headquarters authority's acquisition of new regional headquarters and the toll authority's administration of toll bridge revenues, particularly the use of toll revenues for acquiring the regional headquarters. The audit analysis the audit committee approved contained nine separate objectives. We list the objectives and the methods we used to address them in Table 1.

Table 1
Audit Objectives and the Methods Used to Address Them

	AUDIT OBJECTIVE	METHOD
1	Review and evaluate the laws, rules, and regulations significant to the audit objectives.	Reviewed relevant laws, regulations, and other background materials.
2	Review and assess the space needs assessment of the agencies involved to determine the extent to which the space in the new building meets or exceeds their respective space requirements. In addition: • Determine whether the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority) considered other alternatives to acquiring a new office building. • Review the transportation commission's and the Bay Area Air Quality Management District's (air district) justification for vacating their buildings and relocating to the new building. • Identify the plans for disposing of existing buildings owned by the agencies involved, including the transportation commission, the toll authority, and the air district.	• Interviewed key officials to determine the agencies' justification for vacating their current headquarters buildings, their anticipated growth projections, and their plans for disposing of those buildings. • Reviewed a consultant's report on the agencies' options for colocating, which summarizes the agencies' options for leasing space, purchasing property, and renovating their current buildings. • Reviewed the transportation commission's materials related to its analysis of the growth rate of its staff.
3	Identify the funding sources for the purchase of the new building.	• Interviewed key officials. • Reviewed the toll authority's accounting records to confirm the funding source for purchasing the regional headquarters building. • Reviewed the building purchase agreement.
4	Review and assess any transportation commission and toll authority policies, procedures, and internal controls to determine if there is adequate separation between the two to ensure that decisions regarding the use of toll revenue are in the best interest of the toll payers.	• Interviewed key officials. • Reviewed pertinent laws regarding the roles and responsibilities of the transportation commission and the toll authority, and laws regarding appropriate use of toll revenues. We also reviewed relevant legislative analyses concerning the separation of the transportation commission and the toll authority.

continued on next page . . .

	AUDIT OBJECTIVE	METHOD
5	Determine the appropriateness of the use of toll bridge funds to acquire a headquarters building. Specifically: • Determine whether it is permissible to use toll revenues, including those from the 2010 increase, to acquire an office building. • Determine if there are any prohibitions against the toll authority using toll revenues to acquire a headquarters office building that exceeds its space needs to such an extent that there is room to lease space to other public entities.	• Reviewed relevant statutes regarding the authority of the transportation commission, the toll authority, and a joint powers authority. • Reviewed relevant court decisions and legal opinions.
6	Review and assess the cost-benefit analysis related to the acquisition of the new headquarters building to determine if it was reasonable, was supported, and considered alternatives to purchasing a building. Identify the financial risks, if any, that the transportation commission and the toll authority assumed by acquiring a new office building.	• Interviewed a key official to understand the process the transportation commission and its real estate broker followed to solicit and review properties. • Reviewed the proposals the transportation commission received related to potential properties and the summary materials the real estate broker prepared. • Reviewed board meeting agendas, minutes, and materials of the governing board for the transportation commission related to the property selection.
7	Examine the structure of the transaction to acquire the new building and determine if it has any unique features and whether the public interest is protected.	• Interviewed a key official. • Considered the transportation commission's financial model and its key assumptions about which entities would contribute funds to reimburse the toll authority. • Reviewed the opinions of the value of the property that the real estate broker, the independent consultant, and the property appraisers prepared. • Analyzed the net present value of the cash flows from the property the transportation commission assumed over a 30-year period.
8	Identify whether any of the proposed public agency tenants are taking an equity position in the building. If so, determine the source of revenue and if the tenants are paying for tenant improvements.	• Interviewed key officials. • Reviewed the minutes and related materials from meetings of the governing boards for the transportation commission and the air district and other related documents.
9	Review and assess any other issues that are significant to the acquisition of the new headquarters building.	We did not identify any other significant issues concerning the purchase of the building.

Sources: The California State Auditor's analysis of Joint Legislative Audit Committee audit request number 2011-127, and information and documentation identified in the table column titled *Method*.

Audit Results

The Bay Area Headquarters Authority's Use of Toll Revenues to Purchase a Regional Headquarters Building Likely Is Legally Permissible

In October 2011 the Bay Area Headquarters Authority (headquarters authority)—a joint powers authority created by the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority)—purchased a building, using $93 million in toll bridge revenues. The building will serve as the regional headquarters for these and potentially other entities. Located at 390 Main Street in San Francisco, the building is more than 497,000 square feet and, at the time it was purchased, exceeded the combined space needs of the entities seeking to colocate—the transportation commission, the Bay Area Air Quality Management District, and the Association of Bay Area Governments—by more than 263,000 square feet.[3] As a result, a significant portion of the building will be rented out. Appendix A details two potential occupancy plans for the regional headquarters building as of September 2011 and May 2012. A comparable version of each plan was presented at meetings of the respective governing board (board) for the transportation commission and the headquarters authority.

The toll authority's decision to contribute toll revenues to acquire a larger-than-necessary building has been controversial and was the subject of public debate at board meetings of the transportation commission and toll authority. At a board meeting less than one month before the building was acquired, members of the public as well as staff for certain members of the Legislature, questioned the appropriateness of using public funds to essentially enter the commercial real estate business. Legislative staff for various state senators urged the transportation commission and toll authority to await the completion of this audit before purchasing the building with toll bridge revenues.

Our review found that, if challenged, a court would likely find that the toll authority's decision to contribute toll bridge revenues to purchase 390 Main Street was within its legal authority. Our legal counsel has advised that state law expressly authorizes the toll authority to do all acts necessary or convenient for the exercise of its powers, including, but not limited to, acquiring, constructing, managing, maintaining, leasing, or operating any public facility or improvement. Similarly, state law authorizes the transportation

[3] Throughout this report we use the term *transportation commission* to include both the transportation commission and the toll authority unless otherwise specified.

commission to do any and all things necessary to carry out its statutory purposes. California Streets and Highways Code, Section 30958, expressly authorizes the toll authority to pay its direct and administrative costs from gross annual bridge revenues. In addition, Streets and Highways Code, Section 30959, authorizes the toll authority to contribute funding to the transportation commission in furtherance of the exercise of the toll authority's powers, and on a reimbursement-for-cost basis for transportation commission activities that are not in furtherance of the exercise of the toll authority's powers. Even though the phrases *gross annual bridge revenues* and *direct costs* are not expressly defined in state law, courts interpret statutes according to their plain meaning. Therefore, our legal counsel advised that it is likely that a court would conclude that costs to plan for, acquire, and develop facilities and office space for the toll authority and its staff are direct costs that may be paid from gross annual bridge revenues. We would also expect a court to conclude that the toll authority may contribute toll revenues to the transportation commission to acquire facilities and office space as authorized by Streets and Highways Code, Section 30959.

A court would defer to a determination by the board of the toll authority and the transportation commission that acquiring a headquarters building was both necessary and convenient to carry out their purposes as long as that determination was reasonable rather than "arbitrary, capricious, or lacking evidentiary support."

Further, our legal counsel advised that a court would likely hold that the fact that the acquired building exceeds the transportation commission's and toll authority's current space needs does not limit their board's authority to use toll revenues for the purchase. According to our legal counsel, a court would defer to a determination by the board of the toll authority and the transportation commission that acquiring such a building was both necessary and convenient to carry out their purposes as long as that determination was reasonable rather than "arbitrary, capricious, or lacking evidentiary support."

In May 2012, the California Legislative Counsel Bureau issued an opinion (legislative counsel opinion) that concluded that the toll authority could use toll revenues to purchase a building. The opinion also concluded, however, that a court could determine that using toll revenues to acquire the building exceeded the toll authority's statutory powers because the facility substantially exceeds the administrative office needs of toll bridge project and program administration and the Legislature has not authorized the use of toll bridge revenues for the objective of creating a regional governance colocation facility. Before reaching this conclusion, however, the legislative counsel opinion noted that a court considering the issue would take into account all relevant facts regarding the purposes underlying the building purchase, and would give deference to reasonable determinations made by the headquarters authority regarding the purchase. Applying the standard of whether the decision the board governing the toll authority and transportation commission made to purchase

the building was reasonable rather than arbitrary, capricious, or lacking in evidentiary support, our legal counsel advised that after considering the facts a court would most likely defer to the determination by the toll authority's and the transportation commission's board that acquiring such a building was necessary and convenient to carry out its purposes because the determination was reasonable.

As described in other parts of this report, the toll authority and the transportation commission sought the advice of outside legal counsel and real estate consultants and evaluated against established criteria a variety of properties of different sizes in San Francisco and Oakland before deciding to purchase the building at 390 Main Street in San Francisco. Moreover, the financial model the toll authority and the transportation commission used to advise the governing board in September 2011 showed that, over 30 years, all revenues used to purchase and renovate the building would be recouped and the building would generate an additional $40 million in revenue, all of which would be returned to the toll authority under the joint powers agreement. Based on these facts, our legal counsel advised that a court would likely hold that the board of the toll authority and the transportation commission made a reasonable determination that acquiring the building was necessary and convenient for carrying out their statutory purposes, and that it was permissible to use toll revenues to acquire the building even though the building exceeds the space needs of the toll authority and the transportation commission to such an extent that there is room to lease space to other entities.

Although our report concludes that it likely was legally permissible for the toll authority to use toll revenues to purchase a headquarters building, the lack of a clear distinction between the toll authority and the transportation commission may have caused some to question whether adequate separation between them existed during the process of deciding to purchase a new headquarters building. State law requires that the toll authority be a separate entity from the transportation commission but that both entities report to the same governing board. The law creating the toll authority was amended in 2003 (Senate Bill 916 (SB 916); Chapter 715, Statutes of 2003) and clarified that the toll authority and the transportation commission would report to the same board, but that the toll authority would be a separate entity. When the Legislature considered SB 916, committee analyses stated that the bill would establish the toll authority in its own right, with standard public agency powers and duties. Legislative analyses also stated the intent to move away from the toll authority, "existing as a form of the transportation commission with the same membership for the two bodies."

State law requires that the toll authority be a separate entity from the transportation commission but that both entities report to the same governing board.

The organizational structures of both entities are such that the toll authority's key management is not clearly distinct from the transportation commission's staff.

Despite the provisions of SB 916, it is clear that the toll authority is part of the transportation commission's business operations. During our review we noted that the organizational structures of both entities are such that the toll authority's key management is not clearly distinct from the transportation commission's staff. For example, both entities share the same chief executive officer, the same chief financial officer, and the same general counsel. Furthermore, the financial activities of the toll authority are blended with and are included in the transportation commission's audited financial statements. Nevertheless, the following controls are in place to help ensure adequate separation between the two entities regarding decisions about spending toll revenues: (1) state law defines the appropriate use of toll revenues and (2) the toll authority's governing board approves in a public forum the specific projects and activities that may be funded with toll revenues. In our opinion, these controls seem reasonable.

The Transportation Commission Could Have Disclosed More About the Financial Risk Associated With Purchasing a New Headquarters Building

When the board was deciding whether to purchase a headquarters building in San Francisco, a key selling point the transportation commission raised was that toll payers would be protected under the deal. Specifically, in August 2011, the transportation commission stated that using the toll authority's various cash reserves and contingency funds would allow it to "put a portion of these funds to work" and potentially cover its costs in return. In September 2011 the transportation commission provided its board and the public with a projection of revenues and expenses for the building over a 30-year period showing that contributed toll revenues would be fully repaid. In fact, the September 2011 slide presentation showed a "net after building investment"—or profit—of $40 million.

However, our review and analysis of the transportation commission's 30-year projection showed that, when converted to today's dollars, the expected income will fall short of repaying contributed toll revenues by roughly $30 million. The main cause of the difference is that the transportation commission's presentation to its board did not discount the income projections so as to express them in today's dollars, a concept that we discuss in more detail later. Our analysis also showed that under conditions more favorable than those the transportation commission assumed, such as higher rent per square foot and/or higher occupancy rates, toll payers might experience faster payback periods and larger returns on the contributed toll revenues. However, given the potential for not repaying toll payers as measured in today's dollars, we would have expected the transportation commission to disclose these

potential outcomes to the board and the public so that they could have been more informed about the risks before deciding to purchase the property.

Despite limitations in the transportation commission's presentation to its board, the financial model it developed to project revenues and expenses over a 30-year period is conservative when compared to information it obtained from its various advisers. As one might expect, the transportation commission's projection to repay contributed toll revenues is dependent on how much toll revenue is provided and how much rental income can be earned, given factors such as the expected market rent and level of occupancy. The text box shows key assumptions used in the transportation commission's 30-year financial model. In September 2011 the transportation commission assumed that the total cost to acquire and improve the new headquarters building would be $180 million and the net toll revenue contribution would be $122 million after other contributions were received, including those from the air district and the transportation commission. The projected net income of $162 million over 30 years is based on market rent of $32.40 per square foot—which increases by $1 each year in the model—for an assumed 309,000 rentable square feet and an assumed occupancy rate of 70 percent.

Bay Area Toll Authority's Estimated Net Income From the Regional Headquarters Building as of September 2011

	DOLLARS IN MILLIONS
Purchase price and renovations	($180)
Bay Area Air Quality Management District contribution	24
Metropolitan Transportation Commission contribution	19
Commercial tenant improvement costs recouped from leases	15
Net Bay Area Toll Authority (toll authority) contribution	**($122)***
Net income to the toll authority over 30 years	**$162**
Profit to the toll authority	**$40**
Commercial rental rate	$32.40 per square foot
Occupancy rate	70 percent

Source: The toll authority's financial presentation to its governing board at a September 2011 meeting.

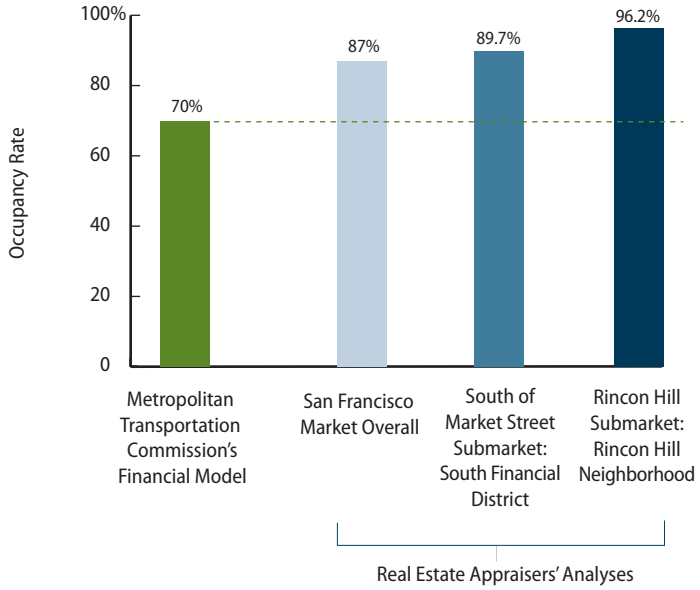
* Although the toll authority was authorized by its governing board to contribute roughly $167 million in toll funds, this financial presentation reflects that only $122 million would be needed after factoring in other estimated contributions.

We found that the transportation commission's rental rate and vacancy rate assumptions were on the conservative side for commercial office space in San Francisco. Specifically, we compared the initial rental rate of $32.40 per square foot that the transportation commission used in its model to the projected rental rate information the transportation commission received from its real estate broker, consultant, and property appraisers. Each developed its own rental revenue projections for 390 Main Street, using annual lease rates of between $31 and $42 per square foot. The transportation commission's beginning rate of $32.40 per square foot is on the lower end of this range. As shown in Figure 2 on the following page, the transportation commission's assumed occupancy rate of 70 percent is also much lower than the overall citywide occupancy rate and the occupancy rates in the areas surrounding the 390 Main Street property, per analyses performed by two independent appraisers.

The transportation commission's projection of future expenses also appears to be either consistent with or more conservative than information provided by its appraisers and investment consultant.

In its 30-year model, expenses averaged roughly $9.7 million annually. This amount is higher than the expected $4 million to $7 million in expenses projected by its investment consultant and two of its appraisers. Finally, the transportation commission's expectation of the cost to improve the San Francisco property was more than the amounts shown by its investment consultant and two appraisers in their analyses.

Figure 2
Market Occupancy Rates for the Second Quarter of 2011 Compared With the Rate the Metropolitan Transportation Commission Used in Its Model



Sources: The Metropolitan Transportation Commission's independent property appraisals dated September 2011 and its financial model.

Using the transportation commission's 30-year financial model, we analyzed whether toll payers could expect to be fully repaid for their contribution of toll revenues. To perform such an analysis, we calculated the net present value (NPV) of the building's projected cash flows over a 30-year period. The NPV approach compares the amount of net income the building generates over time (cash inflow) to the amount of cash outflow—in this case, contributed toll revenues. To arrive at the cash inflow, we discounted the net income so as to convert the cash inflows to today's dollars to take into account a 30-year time span. To arrive at the cash outflow, we updated the transportation commission's financial model to reflect the building's actual purchase price of $93 million and assumed that the costs to improve the building and the expected contributions from the air district and the transportation commission were

timely and accurate. As a result, the total amount to be repaid to the toll authority is approximately $109 million, instead of the $122 million shown in the text box on page 15.

A financial analysis such as an NPV calculation is a function of various assumptions. One key assumption is the interest rate used to account for the time value of money. In our NPV analysis, we used an interest rate of 4.3 percent. In fiscal year 2010–11, a significant source of the toll authority's cash came from issuing bonds to be repaid with toll revenues (toll-revenue bonds). As of June 30, 2011, the toll authority had nearly $7.9 billion in outstanding toll-revenue bonds and total assets of $4.4 billion.[4] We believe our decision to use 4.3 percent is reasonable because it approximates the toll authority's cost of capital, based on information contained in its audited financial statements. In our opinion, applying the same interest rate benchmark in our NPV analysis as bondholders use when they loan money to the toll authority is an appropriate way to assess the likelihood of whether the public's toll funds will be repaid.

In its financial model the transportation commission made two key assumptions that present risk. The first assumption—which we also used in our NPV analysis—is that the Bay Area Air Quality Management District (air district) would contribute $24 million at the beginning of the project to purchase one floor of the new headquarters building. There is risk in this assumption because it is not certain if or when the air district will purchase the space. The agreement the air district and the headquarters authority executed in April 2012 is a 30-year lease with an option to buy at any time during the agreement. We discuss the air district's plans in greater detail later in this report. The second assumption involving risk is that the transportation commission would contribute $19 million in today's dollars, based on its assignment of future rental income from leasing its current Oakland headquarters for roughly 30 years. Whether this is a reasonable assumption is uncertain; as we discuss later in the report, the transportation commission has yet to focus any significant effort on developing a disposition strategy for its Oakland headquarters. If either assumption proves to be wrong, it would affect the calculation of the toll authority's net contribution and could extend the toll revenue payback period.

Finally, the transportation commission's financial model focused on the net income from the building's operations over 30 years. We intentionally focused our NPV calculation on assessing whether the present value of cash inflows generated from the building's rental

[4] The transportation commission's and the toll authority's financial statements show liabilities exceeding assets because the toll bridges are not an asset of either entity. Instead, the toll bridges are owned by the State.

income would be sufficient to repay the toll authority. Our focus on cash inflows to repay the toll authority is the same focus the transportation commission and headquarters authority, respectively, used in their September 2011 and May 2012 public presentations. However, we took the additional step of converting the projected cash flows from the new headquarters building to the equivalent in today's dollars to determine, where applicable, the number of years needed to repay the estimated net contributed toll revenues of $109 million.

Table 2 provides a grid of different NPV results and the expected payback period using only cash flows from rental income. The table is based on the transportation commission's financial model as of September 2011 and our varying assumptions regarding rental and occupancy rates. Green values represent instances in which the NPV is positive—and thus cash flows converted to today's dollars will cover the contributed toll revenues in 30 years' time—whereas red values indicate conditions under which cash flows will not cover the contributed toll revenues. As the table demonstrates, the question of whether toll payers will be repaid depends, in part, on the occupancy and rental rates that can be attained. Under the transportation commission's financial model and conservative assumptions of an initial rental rate of $32.40 per square foot and an occupancy rate of 70 percent, the building will not generate adequate cash flows when converted to today's dollars to repay contributed toll revenues within a 30-year period. In fact, those assumptions result in the cash flows from the building falling short by more than $30.2 million. However, in many alternative scenarios with higher rental and/or occupancy rates, toll revenues will be repaid. Specifically, by charging a rental rate of $38.40 per square foot and achieving an 80 percent occupancy rate, the toll authority would realize $12.7 million in excess cash flows—discounted in today's dollars—allowing it to repay contributed toll revenues within 26 years. Similarly, if the headquarters authority were to achieve an occupancy rate of 85 percent at a starting rent of $38.40 per square foot, the toll authority would earn $23.5 million in excess cash flows over the 30-year period, and would repay contributed toll revenues within 24 years.

Under the transportation commission's financial model and its conservative assumptions about rents and occupancy, the building will not generate adequate cash flows when converted to today's dollars to repay contributed toll revenues within a 30-year period.

The transportation commission's ability to repay toll revenues stems in part from the fact that its September 2011 financial model earmarked a significant portion of the building's space—approximately 309,000 square feet—as producing income from market rents. Our review found that this amount of square footage seems reasonable because it materially reconciles with the square footage shown in Table A.1 in Appendix A for the entities projected to pay market rent and the space to be leased at market rents. This table is a schematic of how the transportation commission envisioned the building's occupancy plan as of September 2011. However, the table does not reflect rents to be paid, and it cannot be used to derive the amount of space designated for market

rents as used in the financial model. Moreover, the dollar amounts in Table 2 cannot be directly derived from the square footage in Table A.1 because of the assumptions and formulas applied in the transportation commission's financial model.

Finally, the amounts shown in Table 2 do not consider the potential value of the new headquarters building if it was sold. For example, the headquarters authority could sell the entire building, or a portion of the building, as a means to raise additional funds to potentially make up the shortfalls highlighted in Table 2. We chose not to consider such a sale in Table 2 because the transportation commission focused its analysis on cash flows from rental income and did not mention to its board any plans to sell the building in the future. Further, the amount of space that could be sold is highly uncertain, given the headquarters authority's drastic changes in May 2012 to the building's proposed layout, as discussed later in this section and shown in Table A.2 in Appendix A. Nevertheless, we acknowledge that the building is an asset that could be sold, if necessary, as a means to return additional funds to the toll authority.

Table 2
Net Present Value of Cash Flows From Rental Income and Resulting Payback Period With Varying Rental and Occupancy Rates Over a 30-Year Period With 309,000 Square Feet at Market Rent (Dollars in Thousands)

ANNUAL OCCUPANCY RATE*	ANNUAL COMMERCIAL OFFICE RENT (PER SQUARE FOOT)†				
	$32.40	$35.40	$38.40	$41.40	$44.40
70%	$(30,288)	$(19,561)	$(8,834)	$1,893 30 years	$12,620 26 years
80	(11,285)	726 30 years	12,737 26 years	24,748 23 years	36,759 21 years
85	(1,784)	10,869 27 years	23,522 24 years	36,175 21 years	48,828 19 years
87	2,017 30 years	14,926 26 years	27,836 23 years	40,746 20 years	53,656 19 years

Source: California State Auditor's net present value analysis based on the Metropolitan Transportation Commission's (transportation commission) September 2011 cash-flow model for 390 Main Street located in San Francisco.

Note: We applied the following definitions to the table:

Net present value: Using the rental and occupancy rates indicated for each box, the amount of net cash flows generated over 30 years by the regional headquarters building, discounted at a rate of 4.3 percent to account for the time value of money.

Red values: Rental and occupancy rates for which the net present value of the cash flows from the regional headquarters building will not repay the Bay Area Toll Authority's (toll authority) expected contribution of $109 million within 30 years.

Green values: Rental and occupancy rates for which the net present value of the cash flows from the regional headquarters building will repay the toll authority's contribution. The payback period in terms of years is also noted.

Payback: The number of years, based on the net present value of the cash flows, needed to repay the toll authority's expected contribution of $109 million.

* We varied the annual occupancy rate between the transportation commission's 70 percent and the 87 percent occupancy rate for the San Francisco market overall as shown in Figure 2 on page 16. The occupancy rate does not pertain to the building as a whole, but rather to a certain amount of space designated to generate market rent.

† The rental rates shown are the beginning values used in the transportation commission's financial model. The model increases these rates by $1 per year over 30 years.

Given the potential that the building's cash flows as measured in today's dollars might not cover contributed toll revenues, we would have expected the transportation commission to have provided the board and the public with information similar to the data shown in Table 2. During our review of the transportation commission's financial model, we noted that its chief financial officer calculated his own NPV amount but did not share the results with the board. The chief financial officer's NPV calculation used a 3 percent discount rate to determine that the building's future income was worth $93 million in today's dollars. When compared to the $122 million in expected net toll fund contributions to purchase and improve the building—as shown in the text box on page 15—the chief financial officer's NPV calculation shows that the cash flow over a 30-year period, converted to today's dollars, would be $29 million short of repaying contributed toll revenues.

The chief financial officer's NPV calculation shows that the cash flow over a 30-year period, converted to today's dollars, would be $29 million short of repaying contributed toll revenues.

When asked why he chose not to share his NPV analysis with the board to demonstrate the range of possible outcomes from purchasing the building and renting available space, the chief financial officer indicated that he did not believe it was necessary or appropriate to share this information with the board because an NPV analysis would assume a return on investment, whereas he wanted the board to focus on the building's value in terms of price per square foot and its value to the transportation commission and the other agencies. The chief financial officer further stated that the transportation commission's model was intended to demonstrate that the toll authority could afford the building and that its purchase would not result in a loss but rather an economic net zero to the transportation commission over the course of 30 years. However, we believe the transportation commission's claim that expected rental income will cover the contributed toll funds is based on an incomplete analysis that should have discounted the building's future cash flows, since the value of those amounts are worth less in today's dollars.

Finally, according to the chief financial officer, presenting the purchase in terms of profit and loss would require many projections and would represent a commitment to a certain return, when that was not the purpose of the project. The toll authority, according to the chief financial officer, considered the acquisition an investment in the organization and region. He asserted that by purchasing a building large enough to house all of the regional agencies, the toll authority would create an investment in regional planning and coordination as well as a direct investment in the future of the transportation commission and the toll authority, in much the same way that one would invest in a house without expecting a return.

Recent plans the headquarters authority made public suggest a further increase in the risk, beyond what is shown in Table 2, that toll revenues will not be repaid with cash flows from the building's

rental income over 30 years. In May 2012 the headquarters authority held a public meeting at which it presented a revised occupancy plan for its new headquarters building. In the revised plan, shown in Table A.2 in Appendix A, the headquarters authority converts roughly 101,000 square feet of building space to an atrium and to building support space, such as closets for electrical and telephone equipment. To determine the effect of this proposed reduction in rentable space on the ability to pay back the contributed toll revenues, we obtained the transportation commission's revised financial model and updated our NPV analysis of the building's cash flows and our calculation of the payback periods. Table 3 shows the results of our analysis.

Table 3
Net Present Value of Cash Flows From Rental Income and Resulting Payback Period With Varying Rental and Occupancy Rates Over a 30-Year Period With 241,000 Square Feet at Market Rent
(Dollars in Thousands)

ANNUAL OCCUPANCY RATE*	ANNUAL COMMERCIAL OFFICE RENT (PER SQUARE FOOT) †				
	$32.40	$35.40	$38.40	$41.40	$44.40
70%	$(53,699)	$(45,262)	$(36,826)	$(28,390)	$(19,953)
80	(39,128)	(29,710)	(20,292)	(10,874)	(1,455)
85	(31,843)	(21,934)	(12,025)	(2,116)	7,794 28 years
87	(28,929)	(18,823)	(8,718)	1,388 30 years	11,493 27 years

Source: California State Auditor's net present value analysis based on a revised 390 Main Street, San Francisco, cash-flow model as reported by the Bay Area Headquarters Authority on May 23, 2012.

Note: We applied the following definitions to the table:

Net present value: Using the rental and occupancy rates indicated for each box, the amount of net cash flows generated over 30 years by the regional headquarters building, discounted at a rate of 4.3 percent to account for the time value of money.

Red values: Rental and occupancy rates for which the net present value of the cash flows from the regional headquarters building will not repay the Bay Area Toll Authority's (toll authority) expected contribution of $112 million within 30 years.

Green values: Rental and occupancy rates for which the net present value of the cash flows from the regional headquarters building will repay the toll authority's contribution within 30 years. The payback period in terms of years is also noted.

Payback: The number of years, based on the net present value of the cash flows, needed to repay the toll authority's expected contribution of $112 million.

* We varied the annual occupancy rate between the Metropolitan Transportation Commission's (transportation commission) 70 percent and the 87 percent occupancy rate for the San Francisco market overall as shown in Figure 2 on page 16. The occupancy rate does not pertain to the building as a whole, but rather to a certain amount of space designated to generate market rent.

† The rental rates shown are the beginning values used in the transportation commission's financial model. The model increases these rates by $1 per year over 30 years.

The revised financial model reflects that the toll authority's expected contribution would increase from $109 million to $112 million. The $3 million increase is a result of less space in the building generating rental income and thus, less income

available to pay for certain expenses. The assumed amount of space earmarked for market rent in the revised financial model is roughly 241,000 square feet. This amount seems reasonable because it materially reconciles with the square footage shown in Table A.2 for entities projected to pay market rent and the spaces to be leased at market rents. However, Table A.2 alone cannot be used to derive the market rent square footage or the amounts presented in Table 3. As can be seen in Table 3, many of the scenarios now project that after converting cash flows over 30 years to today's dollars, the building's rental income will not cover contributed toll revenues. Similar to our comments regarding Table 2, our NPV analysis did not consider the value of the building if sold as a means to ensure that contributed toll revenues are ultimately repaid.

The Transportation Commission and the Air District Faced Challenges With Their Current Headquarters Facilities, Which Led Them to Explore Opportunities to Share a Common Building

The transportation commission's challenge with its current space was that it did not provide room for additional growth.

Although both the transportation commission and the air district acted on the advice of the consultant they jointly hired in June 2010, both had also previously evaluated their separate needs to varying degrees. The transportation commission's challenge with its current space was that it did not provide room for additional growth. In fact, the transportation commission began developing strategies for securing additional space as early as February 2001, when it hired an architect to, among other things, develop a five-year office space plan. To accommodate growth through 2005, and to allow for a less compressed work environment, the architect determined that the transportation commission needed a building with roughly 68,000 square feet. In 2005 the transportation commission bought an ownership interest in the second floor of its Oakland building, which allowed an expansion so that it could house the staff in its satellite office in the Oakland building.[5] More recently, the transportation commission obtained a space needs assessment in July 2011 from its real estate broker's subcontractor, who concluded that the transportation commission needed more than 69,000 square feet of space to accommodate its staff, interns, and temporary employees and to address its needs for additional conference rooms, storage space, and areas for other support functions. The transportation commission currently occupies approximately 48,000 square feet of work space, primarily on the second and third floors of its current headquarters building in Oakland, which does not include the space on the first floor for the public board meeting room, cafeteria, and library.

[5] The transportation commission is a part owner of its Oakland headquarters building under a joint-ownership agreement it executed in 1984 with the Association of Bay Area Governments and the Bay Area Rapid Transit District.

The air district also began identifying its own needs prior to hiring a consultant jointly with the transportation commission. In October 2009 the air district's facility consultant issued its preliminary findings indicating that the air district's building in San Francisco required roughly $12.8 million in maintenance and repairs. Key components of these estimated costs included $2.5 million for a new heating and ventilation system and $4.5 million for a fire sprinkler system. According to the facility consultant, the approximately 84,500-square-foot building actually consists of two structures with an adjoining structural wall, and the building's structural challenges were exacerbated by the gradual addition of walls and partitions over time, resulting in many mazelike and dark areas.

Observing that the air district had been working with a facility consultant, the transportation commission's executive director in September 2009 informed the board that the transportation commission would work with the air district to assess the option of colocating. The executive director saw this assessment as an opportunity to begin a process of analyzing and developing options to meet the transportation commission's future growth needs, since no more space was available in the Oakland headquarters unless other entities vacated. As a result, in January 2010, the transportation commission entered into a cooperative agreement with the air district and the Association of Bay Area Governments (association) to collectively investigate their options for colocating in a regional facility, with the air district serving as the lead agency. In late June 2010 the air district entered into a contract with a real estate broker to explore alternative headquarters solutions and develop a real estate strategy that best aligned with the business and financial objectives of the air district, the transportation commission, and the association.

The real estate broker issued the results of its review in October 2010. In its report, the broker found that the transportation commission's building in Oakland would require minimal renovations; however, it found that the building lacked space for growth. The broker's review of the air district's building found problems similar to those the facility consultant had identified. In particular, the real estate broker estimated that the air district faced more than $30 million in renovation and other costs over the next 10 years should it remain in its San Francisco building. According to the broker, the cost to renovate the building would be equivalent to buying a newer facility in move-in condition. Overall, the real estate broker recommended that the transportation commission, air district, and association consolidate into a single building, and that either San Francisco or Oakland was an appropriate location

Consolidated Space Requirements as Presented to the Metropolitan Transportation Commission's Board

- 150,000 to 200,000 square feet, contiguous space
- Public meeting space
- Proximity to Bay Area Rapid Transit and other transit for employees, board members, and the public
- Energy-efficient building—Leadership in Energy and Evironmental Design certified
- Seismically retrofitted building
- Availability of parking for agency fleet cars, board meetings, and employees
- Secured server room capacity for an Advanced Toll Collection and Accounting System computer system
- Emergency operations center capacity
- Purchase option preferred

Source: Metropolitan Transportation Commission's board presentation dated November 17, 2010.

for consolidation. The text box lists the consolidated space requirements as presented to the transportation commission's board, some of which became criteria for selecting a headquarters building.

Although the Transportation Commission's Reasons for Needing a Building of at Least 350,000 Square Feet Are Unclear, It Followed a Reasonable Process to Evaluate Properties Against Its Search Criteria

The transportation commission's executive management finalized the property search criteria following the board's vote to approve a search for potential locations for a joint headquarters facility. The property criteria included space requirements that the building be at least 350,000 square feet, of which 150,000 to 200,000 square feet must be contiguous to accommodate the needs of public agencies. This contiguous space requirement is consistent with the results of the broker's November 2010 presentation to the board regarding the space needs of the transportation commission, toll authority, association, and air district. However, the specified overall building size was roughly twice the amount shared with the board in November 2010. When we asked the transportation commission's executive director why he approved the 350,000-square-foot space requirement in the request for proposals (RFP), he stated that he wanted to ensure that the new headquarters building would have sufficient room for growth over the long term—20 years or more—and that income generation did not factor into the determination of needed space at the time. However, the executive director stated that income generation was considered when evaluating the final real estate options and determining which option made the most economic sense. According to the executive director, the transportation commission did not have to consider economics but did so to provide an added benefit, a means of returning capital to the toll authority.

Given these statements, it is not clear to us what the transportation commission's motivation was—growth or income—in setting the criteria for the building's size. The chief financial officer explained that the transportation commission's projected space needs were finalized by its executive management in undocumented internal discussions about projects that would affect the need for additional work space. When asked about these anticipated projects and how they informed the transportation commission's

expectations regarding its future space needs, the chief financial officer acknowledged that there is no evidence or documentation to substantiate the amount of space the transportation commission reserved in the new building. Rather, according to the chief financial officer, the transportation commission's space estimates were based on management's best guess of its future responsibilities, the specifics of which have not yet been determined. In an undated slide presentation the chief financial officer provided to us, the project's goal was stated as being to obtain a building that the transportation commission can grow into while maximizing protection of the toll fund investment. The presentation focused on strategies to minimize investment risk—such as following a competitive procurement process—and to maximize the protection of the toll investment through the formation of the headquarters authority. The chief financial officer's presentation also stated that the process was designed to ensure that the toll authority gets its money back and has the opportunity to earn a return on its investment.

Ultimately, the transportation commission's executive director explained, the need to accommodate future growth was the key motivation for moving. He indicated that the toll authority and transportation commission have more than doubled in size in the past 20 years and have outgrown the current facility. According to the executive director, given this history, purchasing a building with only 150,000 to 200,000 square feet today would in short order leave the colocating agencies in the identical position that they are in today. The executive director further explained that prudence dictated considering a larger space, the need for which can be attributed to his agency's strong performance. In the simplest terms, according to the executive director, when you are good at something you get more work, and it would not be prudent to believe that the trend of being given additional responsibilities by the Legislature would stop as of 2011. In setting the building's size, the executive director explained that he wanted to include a margin of safety for unknowns and room to accommodate the colocating agencies' future growth needs.

However, despite the executive director's assertions about the need to accommodate anticipated growth, we question his explanation, given that his staff have been unable to provide specifics on their increased responsibilities and how such responsibilities could reasonably translate into the possibility that public agencies will eventually displace non-public agency tenants in the new building. Further, we note that the financial model for the building that his staff developed in September 2011—the same financial model used to tell the board and public that toll funds would be repaid—does not show the transportation commission occupying progressively more space over the 30-year period.

Despite the executive director's assertions about the need to accommodate anticipated growth, we question his explanation, given that his staff have been unable to provide specifics on their increased responsibilities.

In March 2011 the transportation commission's broker began soliciting proposals, using the search criteria that had been established, and in May 2011 it presented its recommendations for five finalist properties. Our review of the broker and transportation commission's evaluation of the five finalist properties found that the process followed was reasonable, notwithstanding how the criteria for the building's size was established. For example, we determined that the real estate broker consistently evaluated the five properties against the established criteria. In addition, the real estate broker's method for deriving a price per square foot was reasonably consistent for each of the five finalists. The real estate broker generally derived the price per square foot based on the purchase price each seller offered and the broker's estimates of additional costs, such as the cost to renovate the space for public agencies and to lease excess space to third parties. The broker's estimates of the total occupancy cost and corresponding price per square foot are reflected in Table 4.

Table 4
Summary of the Cost and Price per Square Foot of Five Proposed Regional Headquarters

	PROPERTY ADDRESS				
FACTORS USED IN COMPUTING PRICE PER SQUARE FOOT	390 MAIN STREET, SAN FRANCISCO	875 STEVENSON STREET, SAN FRANCISCO	1945 BROADWAY, OAKLAND	1221 BROADWAY, OAKLAND	1100 BROADWAY, OAKLAND
Total cost to occupy property*	$148,332,669	$105,470,686	$113,305,535	Not provided/unknown†	$164,177,401
Total rentable square footage	497,204	334,122	360,440	504,855	318,397
Price per square foot‡	$298	$316	$314	Not provided/unknown†	$516

Sources: Initial and revised proposals submitted in response to the real estate broker's request for proposals (RFP) and the real estate broker's financial analysis of each property.

* The real estate broker used the purchase price offered by the property owner, along with other costs associated with renovating the property and leasing excess space, to determine the total cost to occupy the property.

† Not provided: This property proposal did not contain the information specified in the RFP. As a result, the real estate broker could not fully evaluate the property.

‡ The price per square foot is the total cost to occupy the property divided by total rentable square feet.

According to the transportation commission's chief financial officer, price per square foot was a key measure the real estate broker and the transportation commission used to compare the five properties. Appendix B lists the criteria the real estate broker used to evaluate the five finalists and shows how each property compared to those criteria. Through their analysis, the real estate broker and the transportation commission identified issues with four of the proposed properties that eliminated those properties from further consideration. Two properties were eliminated based on their size and cost. Specifically, the transportation commission and its broker determined that there would not be enough space in the building at 875 Stevenson Street, San Francisco, to lease at market rates

in order to subsidize the building's costs. Similarly, an analysis of the 1100 Broadway, Oakland, property revealed that its size and the costs to construct the building might exceed what could be recouped through market-rate leases. In addition, the proposal for 1100 Broadway stated that delivery of the building would take place in 30 months, which exceeded the 24-month time-to-occupy requirement specified in the RFP. The third property, 1945 Broadway, Oakland, was also eliminated because of concerns with the time frame within which the space would be available. The property required extensive renovation, and the real estate broker indicated that it would not be ready to occupy within the required 24-month time frame. Finally, the building at 1221 Broadway, Oakland, was eliminated because the owners were offering only a long-term lease and did not want to sell the property.

The Transportation Commission's Board Was Generally Informed Throughout the Property Selection Process

Although it should have disclosed more about the financial risks of purchasing the building and should have had better evidence to substantiate its space needs, the transportation commission provided its board with materials that informed the board's decision to select the new headquarters building. For example, at the November 2010 board meeting, the transportation commission described the process it planned to follow, which included hiring a real estate broker, issuing an RFP, and presenting the results of this work to the board the following spring. However, as noted on page 24, the board was unaware that the search would focus on buildings with at least 350,000 square feet.

The transportation commission's broker received proposals for 12 properties and determined that five substantially met the search criteria. In a May 2011 meeting, the transportation commission's broker provided a presentation to the board in closed session, discussing the findings and recommendations for properties warranting further consideration. Following this presentation, the board voted unanimously to authorize staff to proceed with real estate negotiations for five properties. After identifying flaws with four of the properties, the transportation commission's executive director recommended to the board that 390 Main Street be purchased. At the July 2011 board meeting, during a closed session, the transportation commission presented the board with a number of key items for the one remaining property—390 Main Street—including the costs to renovate the property, the anticipated source of funds, and the potential income the property might generate. Finally, in a September 2011 public presentation to the board, the transportation commission informed board members that the toll authority's anticipated net contribution of $122 million to

purchase the building at 390 Main Street would be repaid with $162 million over 30 years, based on the anticipated net income generated from leasing the excess space. From materials presented to the board between May and September 2011, it is clear that the board was aware that the 390 Main Street building exceeded the transportation commission's current space needs and represented a purchase that offered both the flexibility to accommodate future growth and the potential to generate sufficient rental income to fully repay contributed toll revenues. Following comments from the public and the board questioning the size and location of the new headquarters building, the board voted in September 2011 to proceed with acquiring 390 Main Street.

The Transportation Commission and Its Board Were Responsive to Public Criticism About Plans for Regional Headquarters in San Francisco

The transportation commission and its board afforded the public an opportunity to comment on the acquisition of a regional headquarters building located in San Francisco and took steps to respond to the comments. In August 2011 the transportation commission's board held a meeting in response to a letter from the city of Oakland alleging an open-meeting violation that occurred at the July 2011 meeting when the board voted in closed session to open escrow to purchase 390 Main Street. Board minutes for the August 2011 meeting indicate that numerous individuals, including staff representing members of the Legislature and the city of Oakland, expressed concerns about the board's previous decision to move to San Francisco. The comments generally expressed support for a proposal to construct a new building in Oakland but also raised concerns regarding transit accessibility at the San Francisco building and the transportation commission's authority to enter into the real estate business. In reaction to the public's concerns, the board voted to rescind the action it took in July approving opening escrow to purchase the regional headquarters building. The board also created an ad hoc committee to study the legal and financial issues surrounding the regional headquarters selection process and directed it to report back with a recommendation for action by mid-October 2011.

In reaction to the public's concerns, the board voted to rescind the action it took in July 2011 approving opening escrow to purchase the regional headquarters.

The ad hoc committee—made up of the board's chair and vice chair and four other board members—met at least twice with the transportation commission's staff to review the due diligence material that was developed supporting the decision to purchase 390 Main Street. In particular, the ad hoc committee reviewed the process for soliciting property proposals, considered a legal opinion sought from outside counsel that concluded that using toll revenues to purchase the building would be permitted under

California law, and was briefed on the total budget for the targeted property and the building's expected net operating income over a 30-year period, based on the transportation commission's financial model, discussed previously. The ad hoc committee was also provided with two independent appraisals of 390 Main Street, showing "as-is" purchase values of $80 million and $111 million.

The ad hoc committee members also reviewed a comparison of the total cost of acquiring and improving 390 Main Street versus an alternative property in Oakland at 1100 Broadway. The ad hoc committee considered the fact that the property owners for 1100 Broadway had reduced the price from the initial proposed price of $152.6 million to $118.6 million to build a 20-story building with 318,400 rentable square feet. Most of this reduction, roughly $24.6 million, was based on the assumption that the transportation commission and toll authority would finance the developer's construction of the building. However, the transportation commission's chief financial officer indicated that the transportation commission would not have financed the construction of 1100 Broadway because the additional financial risk of doing so was not warranted, given that it had readily available properties that it had previously determined to be of better value. The price per square foot based on the reduced price amounted to roughly $373, according to the property's owner, and did not include other expected costs such as tenant improvements as calculated by the real estate broker and reflected in Table 4 on page 26.[6]

In contrast to 1100 Broadway, the ad hoc committee saw that the total cost to acquire 390 Main Street—including the purchase price and building and tenant improvements—was roughly $180 million. With the seller of 390 Main Street indicating that the building had 497,000 rentable square feet, the total cost to acquire 390 Main Street was $362 per square foot, or $11 less per square foot than 1100 Broadway's revised purchase price of $373 per square foot, which excluded needed improvements. Ultimately, the transportation commission showed the ad hoc committee that when needed improvements and financing were factored in, the total cost of 1100 Broadway would likely be $562 per square foot.

In September 2011 the ad hoc committee reported to the board that the real estate search process was thorough, fair, and transparent to all bidders, and resulted properly in the recommendation to purchase the property located at 390 Main Street. The ad hoc committee recommended that the board authorize the purchase of the San Francisco property, which it did later that month.

The ad hoc committee reported to the board that the real estate search process was thorough, fair, and transparent to all bidders, and resulted properly in the recommendation to purchase the 390 Main Street property.

[6] The developer's proposal for 1100 Broadway specified that it would deliver the building in a core and shell condition, indicating that the build-out of tenant improvements was not included.

Lease Terms From the Agreement Between the Bay Area Air Quality Management District and the Bay Area Headquarters Authority for Office Space

The agreement provides for a 30-year lease for office space. The terms include:

- The Bay Area Air Quality Management District (air district) will obtain 62,500 square feet of office and laboratory space.
- The air district will pay a base rental rate of $1.9 million annually for the first 10 years; the base rent will be adjusted beginning in year 11 based on 90 percent of the current market rate. Annual rent will then be adjusted every five years thereafter.
- The air district will pay additional rent based on the proportionate share of the common area and joint space amenities, including meeting rooms and a library.
- The Bay Area Headquarters Authority will pay utility costs and provide the tenant improvements, including office furniture.

Source: 390 Main Street Office Lease, Bay Area Headquarters Authority as Landlord, and Bay Area Air Quality Management District as Tenant, effective April 19, 2012.

The Headquarters Authority Has Confirmed the Air District as a Tenant and Has Had Discussions With Two Other Agencies

In April 2012 the headquarters authority executed a lease agreement with the air district for office space at 390 Main Street. The text box summarizes only the lease terms of that agreement. Moreover, the air district has expressed its intention to purchase the space it will occupy in the regional headquarters, and the lease terms account for this possible purchase. The lease agreement includes an option for the air district to purchase its space at any time during its 30-year lease, but if it purchases the space within 10 years of occupancy it will be guaranteed a fixed price not to exceed $385 per square foot, or roughly $24 million. During its November 2011 board meeting, the air district's executive management expressed an interest in issuing bonds to finance its office space purchase, indicating that the toll authority would buy these bonds. The transportation commission's chief financial officer stated that he is aware of the air district's financing plans, but the toll authority's participation would depend on the final structure of the financing plan, including the interest rate and other factors. The air district's general counsel confirmed in April 2012 that the financing details are not final and there is no date by which he expects that work to be complete.

In addition, two other public agencies appear interested in obtaining office space in 390 Main Street. Specifically, the headquarters authority is in discussions with representatives for the San Francisco Bay Area Conservation and Development Commission (BCDC) to lease approximately 17,000 square feet of office space.[7] Further, according to counsel for the association, the association has approached the headquarters authority to discuss possibly relocating to 390 Main Street. In fact, both the BCDC and the association are currently participating in space-planning activities for 390 Main Street with the headquarters authority, meeting as recently as April 2012. According to a status report that the headquarters authority's deputy executive director provided the board in June 2012, the association will make its decision following a subcommittee report in September 2012. Finally, according to

[7] Following the conclusion of our audit fieldwork the headquarter's authority informed its board in July 2012 that it was removing BCDC from its planning process since the governor's office denied BCDC's request to relocate.

the transportation commission's director of administration, the transportation commission is in active discussions with two of its customer service contractors about relocating their nearly 200 employees into approximately 62,300 square feet in the regional headquarters building sometime in 2013 and 2014.

The Transportation Commission and the Air District Have Yet to Decide What to Do With Their Existing Buildings

In the fall of 2013 the transportation commission intends to move to the regional headquarters building and vacate its current site in Oakland. Therefore, the transportation commission is faced with a decision about whether to sell or lease the space it occupies in its current Oakland headquarters building. The transportation commission's options for selling or leasing its current space are influenced by ownership of that building. The transportation commission is a part owner of its Oakland headquarters under a joint-ownership agreement it executed in 1984 with the Bay Area Rapid Transit District (BART) and the association. The joint-ownership agreement specifies that BART and the association have the right of first refusal to buy the space the transportation commission owns. However, according to the chief financial officer, should BART and the association decline to exercise their right, the transportation commission will likely retain ownership and lease the space to a tenant. At the June 2012 headquarters authority board meeting, staff briefed the board that an RFP would be issued and would include optional services for assisting with disposing of the Oakland headquarters building. The headquarters authority expects to issue the RFP in September 2012 and to seek board approval in December 2012.

The transportation commission is faced with a decision about whether to sell or lease the space it occupies in its current Oakland headquarters building.

Like the transportation commission, the air district must make decisions about the building it currently owns and occupies in San Francisco. In April 2012 the air district issued an RFP for a commercial real estate brokerage firm to assist it in selling or leasing its San Francisco headquarters; the air district amended the RFP in May to reflect that it will award a contract in mid-September 2012. The amended RFP states that the air district expects to begin work with the real estate broker in the summer of 2012 and to complete work in about July 2013, to correspond with the planned move to the regional headquarters building. Although the analysis is almost two years old, in October 2010 the real estate broker guiding the transportation commission and air district through their regional headquarters planning process at that time concluded that, given the air district building's age and condition, the "as-is" sales price is estimated to be $4 million. However, the current RFP states that the selected real estate broker will research the potential market, determine an appropriate sales price or rent, develop appropriate

disclosures, and develop and implement market strategies that will produce the highest and most certain financial return to the air district.

Recommendations

If the Legislature believes state law provides the toll authority with too much discretion over its use of toll revenues, it should consider amending state law to more narrowly define how toll revenues that are not immediately needed for bridge maintenance or debt service may be spent or invested. For example, the Legislature might consider imposing specific limitations or prohibitions on the use of toll revenues to acquire real estate for administrative or investment purposes.

If the Legislature desires greater separation between the transportation commission and the toll authority, it should consider amending state law to require that each entity have its own key executive management staff, such as its own chief executive officer, chief financial officer, and general counsel.

We conducted this audit under the authority vested in the California State Auditor by Section 8543 et seq. of the California Government Code and according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives specified in the scope section of the report. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Respectfully submitted,

Elaine M. Howle

ELAINE M. HOWLE, CPA
State Auditor

Date: August 28, 2012

Staff: Grant Parks, Audit Principal
Sharon L. Fuller, CPA
Ralph M. Flynn, JD
Erin Satterwhite, MBA
Maya Wallace, MPPA

Legal Counsel: Scott A. Baxter, JD

For questions regarding the contents of this report, please contact Margarita Fernández, Chief of Public Affairs, at 916.445.0255

Appendix A

POTENTIAL OCCUPANCY PLANS FOR THE REGIONAL HEADQUARTERS

The Bay Area Headquarters Authority (headquarters authority)—an entity created by the Metropolitan Transportation Commission (transportation commission) and the Bay Area Toll Authority (toll authority)—purchased a property located at 390 Main Street in San Francisco. The building will serve as a headquarters for these and possibly other public entities. Table A.1 demonstrates, as of September 2011, the plan for the potential occupancy of the regional headquarters building; the transportation commission presented a comparable schematic to its board.

Table A.1
Potential Occupancy Plan for the Regional Headquarters Building as of September 2011

FLOOR	OCCUPANCY				RENTABLE SQUARE FEET (sq. ft.)
8	Metropolitan Transportation Commission (transportation commission) and Bay Area Toll Authority (toll authority)				62,500
7	Bay Area Air Quality Management District				62,500
6	Support space* 26,400 sq. ft.	Association of Bay Area Governments 17,000 sq. ft.	San Francisco Bay Conservation and Development Commission (BCDC) 19,000 sq. ft.‡		62,400
5	Transportation Commission and Toll Authority customer service (over time)†				62,300
4	Tenant to be determined	Tenant to be determined	Tenant to be determined		62,100
3	Tenant to be determined	Tenant to be determined	Tenant to be determined		62,000
2	Tenant to be determined	Tenant to be determined	Tenant to be determined		57,800
1	Lobby and Cafeteria 10,000 sq. ft.	Auditorium 26,700 sq. ft.	Air Lab 2,500 sq. ft.	Garage 26,700 sq. ft.	65,900

Gross square feet	497,500 sq. ft.	100%
Space identified for the colocating agencies	197,600 sq. ft.	40%
Space identified for one public entity, certain customer service vendors,† and other tenants to be determined	263,200 sq. ft.	53%
Non-work space	36,700 sq. ft.	7%

Source: California State Auditor's (state auditor) analysis based on material presented to the governing board for the transportation commission and toll authority, September 28, 2011.

Note: To correct for minor math errors in the transportation commission's September 28, 2011, presentation, the state auditor adjusted certain square footage amounts. We also present colocating agency space versus other tenant space, excluding the lobby, cafeteria, and garage spaces from these amounts.

* According to the chief financial officer, the transportation commission and toll authority intend to allocate work space for administrative services, such as printing, information technology, graphics, purchasing, and receiving, which would potentially benefit multiple public agencies.

† The transportation commission and toll authority intend for vendors who provide customer support services, such as staffing for customer call centers, to occupy space in the building in the future, possibly in 2013 and 2014.

‡ Following the conclusion of our audit fieldwork the headquarter's authority informed its board in July 2012 that it was removing BCDC from its planning process since the governor's office denied BCDC's request to relocate.

Table A.1 is divided primarily between space for the colocating agencies and space available for other tenants. The colocating agency space identifies the space the transportation commission, the toll authority, the Bay Area Air Quality Management District (air district), and the Association of Bay Area Governments (association) might occupy, including shared space for agency support and an auditorium. The occupancy plan also reflects space for the San Francisco Bay Conservation and Development Commission (BCDC). However, we have not included BCDC as a colocating agency because it was not a formal part of the various phases that led up to the headquarters building purchase. Figure 1 on page 8 provides a timeline of these phases. Although the association and BCDC are currently participating in space-planning activities for the building, neither has executed a lease or purchase agreement to secure their space.[8] As shown in Table A.1, the space designated for the colocating agencies accounts for nearly 198,000 square feet, with just over 263,000 planned for other tenants.

The headquarters authority made public a revised proposed occupancy plan for 390 Main Street on May 23, 2012, reflecting a substantially reduced amount of leasable floor space. As shown in Table A.2, the revised plan designates 101,000 square feet, or 20 percent of the building's gross square footage, for building core and support—representing a planned seven-story atrium and building support space such as electrical and telephone closets. This space is unleasable. The May 2012 schematic provided far less detail than the September 2011 schematic concerning agency and tenant placement. However, the colocating agencies were designated a total of 187,000 square feet, including an air lab, an auditorium, a conference center, and a library—or roughly 10,600 square feet less than was designated in the September 2011 occupancy plan. Notes on the plan also indicate that space is designated for the association and the BCDC.

[8] Following the conclusion of our audit fieldwork the headquarter's authority informed its board in July 2012 that it was removing BCDC from its planning process since the governor's office denied BCDC's request to relocate.

Table A.2
Proposed Occupancy Plan for the Regional Headquarters Building as of May 2012

FLOOR	BUILDING CORE SQUARE FEET (sq. ft.)	OCCUPANCY	RENTABLE SQUARE FEET (sq. ft.)
8	11,000	**Agency space** 53,000 sq. ft.	53,000
7	11,000	**Agency space** 53,000 sq. ft.	53,000
6	11,000	**Agency space** 53,000 sq. ft.	53,000
5	11,000	**Tenant to be determined** 53,000 sq. ft.	53,000
4	11,000	**Tenant to be determined** 17,000 sq. ft. | **Tenant to be determined** 36,000 sq. ft.	53,000
3	11,000	**Tenant to be determined** 44,000 sq. ft. | **Boardroom/ auditorium** 9,000 sq. ft.	48,500
2	11,000	**Building support** 6,000 sq. ft. | **Parking and bike lockers** 22,000 sq. ft. | **Tenant to be determined** 11,000 sq. ft. | **Library showcase** 5,000 sq. ft.	42,500
1	6,000	**Building support** 12,000 sq. ft. | **Parking** 18,000 sq. ft. | **Air lab** 5,000 sq. ft. | **Tenant to be determined** 12,000 sq. ft. | **Lobby** 2,000 sq. ft. | **Conference center** 9,000 sq. ft.	46,000

Gross square feet	**503,000 sq. ft.**	**100%**
Space identified for the colocating agencies	187,000 sq. ft.	37%
Space for tenants to be determined	173,000 sq. ft.	35%
Building core and support space	101,000 sq. ft.	20%
Non-work space	42,000 sq. ft.	8%

Source: California State Auditor's analysis based on material presented on May 23, 2012, to the governing board for the Bay Area Headquarters Authority.

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Appendix B

COMPARISON OF THE FIVE PROPOSED REGIONAL HEADQUARTERS PROPERTIES AGAINST VARIOUS CRITERIA

The Metropolitan Transportation Commission (transportation commission) and the Bay Area Air Quality Management District established requirements for their regional headquarters. The property criteria were reflected in the request for proposals the transportation commission's real estate broker issued in March 2011 to solicit potential properties. Table B on the following page summarizes the criteria and reflects whether each of the five proposed properties met the criteria, based on the information collected by the broker. These are the five short-list properties the transportation commission and its real estate broker initially determined were viable options.

Table B
Comparison of Five Proposed Regional Headquarters Properties to Various Criteria

	PROPERTY ADDRESS				
	390 MAIN STREET, SAN FRANCISCO	875 STEVENSON STREET, SAN FRANCISCO	1945 BROADWAY, OAKLAND	1221 BROADWAY, OAKLAND	1100 BROADWAY, OAKLAND
Property Criteria					
Project size (minimum 350,000 rentable square feet)	✓	✗	✓	✓	✗
Contiguous availability (150,000 to 200,000 usable square feet)	✓	✗	✓	✓	✓
Occupancy timing (available within 24 months)	✓	✓	✗	✓	✗
Located within city of Oakland or San Francisco	✓	✓	✓	✓	✓
Located within 0.5 mile of nearest Bay Area Rapid Transit Station and other forms of mass transit	✓	✓	✓	✓	✓
Public meeting space	✓	✓	✓	✓	✓
Code compliance: seismic*	✓	✓	✓	Not provided/ unknown†	✓
Code compliance: Americans with Disability Act*	✓	✓	✓	Not provided/ unknown†	✓
Code compliance: other*‡	✓	✓	✓	Not provided/ unknown†	✓
Leadership in Energy and Environmental Design certified or able to obtain certification	✓	✓	✓	✓	✓
Purchase option§	✓	✓	✓	✗	✓
Other Evaluation Criteria					
Parking available	✓	✓	✓	✗	✓
Ability to house small air-testing lab with dock/ delivery access	✓	✓	✓	Not provided/ unknown†	✓

Sources: Initial and revised proposals submitted in response to the real estate broker's request for proposals (RFP) and the real estate broker's financial analyses of each property.

✓ = The proposed regional headquarters property meets the criteria.
✗ = The proposed regional headquarters property does not meet the criteria.

* The RFP indicated that the property must meet or be able to meet seismic, Americans with Disabilities Act, and other code compliance requirements without extraordinary cost.

† Not provided: This property proposal did not contain the information specified in the RFP. As a result, the real estate broker could not fully evaluate the property.

‡ The seller's proposal addressed other code compliance requirements applicable to the property, such as that the 875 Stevenson property is required to comply with hazardous materials codes.

§ The RFP specified that each property must be available for immediate purchase or offered as a short-term lease with a fixed purchase option.

(Agency comments provided as text only.)

July 30, 2012

Metropolitan Transportation Commission/Bay Area Toll Authority
101 Eighth Street
Oakland, California 94607-4700

Ms. Elaine M. Howle*
California State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Re: Draft Audit Report 2011-127

Dear Ms. Howle:

Enclosed please find the Metropolitan Transportation Commission/Bay Area Toll Authority response to your draft audit report, sent to Steve Heminger by letter with enclosure, dated July 24, 2012.

Very truly yours,

(Signed by: Adrienne D. Weil)

Adrienne D. Weil
General Counsel

* California State Auditor's comments begin on page 43.

(Agency comments provided as text only.)

July 30, 2012

Metropolitan Transportation Commission/Bay Area Toll Authority
101 Eighth Street
Oakland, California 94607-4700

Ms. Elaine M. Howle
California State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Ms. Howle:

Thank you for the opportunity to review and comment on the draft report prepared by the Bureau of State Audits (BSA) regarding the acquisition of 390 Main Street in San Francisco as a headquarters facility to provide more integrated and efficient regional planning for the Bay Area. The Bay Area Toll Authority and Metropolitan Transportation Commission (BATA/MTC) appreciate your staff's extensive and thorough review of a long, complex and multifactored real estate process. We agree with the BSA on the importance of transparency, responsiveness and disclosure in conducting the public's business.

We are very pleased the BSA validated most of our work and found that a court "would likely find [BATA's] decision to contribute toll bridge revenues to purchase 390 Main Street was within its legal authority." We also appreciated your findings that our board was generally informed throughout the property selection process, and that we were responsive to public criticism when it surfaced.

(1) We respectfully disagree with the BSA's presentation and analysis of net present value. We note that we did not buy the building as an investment. We bought it as a long-term home to co-locate BATA/MTC and other related regional agencies. We therefore evaluated it as one would evaluate the purchase of a home:
(2) as the least cost per square foot option. The building has excess space to start, but we expect growth over the next thirty years. It would have been imprudent to buy a building without extra space. The reason for the nominal value analysis presented to our boards was not to show a return on investment, per se, but to show a mitigation in the cost of the extra space until it would ultimately be filled by agency operations.

We appreciate the BSA noting in its draft report that its present value analysis "does not consider the potential value of the new headquarters building if it was sold." We believe that your evaluation should have
(3) considered some residual value (whether of the building, the land underneath it, or both) to be a complete present value analysis. Had the BSA done so, all recovery scenarios except one would be positive. Although the BSA did not include any asset value, we note that the midpoint scenario in Table 3 (80% building occupancy with a rental rate of $38.40/square foot) results in an 82% "return" to BATA plus ownership of the land and the building asset. Such a result is well within BATA's risk parameters.

(4) Finally, we believe the two recommendations in the draft report are not supported by the findings of the audit which determined the transaction likely to be legal and that MTC and BATA have reasonable internal controls in place to protect the fiduciary interests of both bodies, even though they are served by a common staff and board. Clearly, it is a policy matter for the Legislature to consider whether any alterations to the BATA enabling statute are warranted by changing circumstances. We would emphasize, however, that

the Legislature has one critical restriction placed on its ability to enact such changes: the statutory pledge, also included in BATA's bond indentures, not to impair BATA's contract with the bondholders while any bonds are outstanding (see Streets and Highways Code Section 30963). Any changes to BATA's authority over toll revenues cannot impair any of BATA's agreements with bondholders and with any parties to contracts made with BATA, until the principal and interest on all BATA bonds are fully paid and all contracts fully discharged.

We believe that BATA's current governance and administrative structure has served both the state and the region well. We are proud of our record of achieving one of the lowest overall costs of debt in the country and one of the highest credit ratings among transportation revenue bond issuers in the nation. Since BATA was established in 1998, we have overseen completion of the $2.4 billion voter-approved Regional Measure (RM) 1 program, allocation of more than 80% of RM 2 funds out of a total amount of $1.5 billion, and completion of the $9.1 billion seismic retrofit program forecast for 2013 within the same budget approved by the Legislature in 2005, as amended by the addition of the Dumbarton and Antioch bridge projects in 2009. In total, BATA and its project partners have delivered nearly $13 billion of transportation improvements to Bay Area toll payers in little over a decade.

In closing, I would like to acknowledge the enormous amount of time and resources both the BSA and BATA/MTC expended in the course of completing this audit. We greatly appreciate the professionalism and courtesy BSA management and staff accorded us, and hope they found us to provide the same in return.

Sincerely,

(Signed by: Adrienne J. Tissier)

Adrienne J. Tissier
Chair

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Comments

CALIFORNIA STATE AUDITOR'S COMMENTS ON THE RESPONSE FROM THE METROPOLITAN TRANSPORTATION COMMISSION AND BAY AREA TOLL AUTHORITY

To provide clarity and perspective, we are commenting on the Metropolitan Transportation Commission's (transportation commission) and Bay Area Toll Authority's (toll authority) response to our audit. The numbers below correspond to the numbers we have placed in the margin of the transportation commission's and toll authority's response. For ease of reading, we refer to both entities collectively as the transportation commission, unless otherwise noted.

We believe our net present value (NPV) presentation and analysis is appropriate. Our analysis on pages 16 through 22 discuss how the transportation commission did not disclose the financial risk to its board and the public when it concluded in September 2011 that the new headquarters building had a "net after building investment"—or profit—of $40 million over a 30-year period. A central part of the transportation commission's argument for purchasing the building was that toll payers would be protected because the toll funds contributed towards the purchase would be repaid. As we state on page 16, our NPV analysis compared contributed toll revenue (cash outflows) with the building's projected net income (cash inflows) as measured in today's dollars to ultimately conclude as to whether toll revenues will be repaid over a 30-year period. Our analysis revealed that in some circumstances the toll authority will be repaid within 30 years while under other circumstances it will not. Our conclusions are shown in tables 2 and 3 on pages 19 and 21, respectively. (1)

The transportation commission states that it will grow in the future, suggesting that it was justified in purchasing a building with roughly 497,000 square feet. However, as we note on pages 24 through 25, the transportation commission's reasons for searching for buildings with at least 350,000 square feet are unclear. As noted on pages 24 and 25, the transportation commission's chief financial officer explained that his agency's space needs were based on management's best guess of its future responsibilities, the specifics of which have not yet been determined. Further, the transportation commission's chief executive officer explained that he was trying to accommodate future growth for his agency and others. However, as we note on page 25, the transportation commission's own financial projections do not assume the transportation commission will occupy progressively more space in the building over a 30-year period. (2)

(3) We disagree with the transportation commission's assertion that our NPV analysis is incomplete. As we state on page 19 of the report, we chose not to consider the building's residual value because the transportation commission did not mention to its board and the public any plan to sell the building in the future to ensure toll funds contributed towards the purchase would be repaid. Further, the amount of space in the new building that could be sold is highly uncertain given the significant changes to the building's proposed layout revealed in May 2012.

(4) We believe the two recommendations in our report are warranted and supported by the report's conclusions. Our first recommendation is based on our discussion on page 11 where we describe state law that allows the toll authority "to do all acts necessary or convenient" to exercise its power, including acquiring office space. Based on this broad authority and the transportation commission's inability to provide analysis justifying why it needed a building with so much space—other than general expectations for its future growth—we believe members of the Legislature may wish to reconsider existing law. Our second recommendation is based on pages 13 and 14, which explain that the Legislature intended for the toll authority to be separate from the transportation commission but that the executive management for both entities are the same.

cc: Members of the Legislature
Office of the Lieutenant Governor
Little Hoover Commission
Department of Finance
Attorney General
State Controller
State Treasurer
Legislative Analyst
Senate Office of Research
California Research Bureau
Capitol Press

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson John Gioia and Members of the Board of Directors

From: Jack P. Broadbent
Executive Officer/APCO

Date: September 12, 2012

Re: Public Hearing to Consider Adoption of Proposed Regulation 9: Inorganic Gaseous Pollutants, Rule 13: Nitrogen Oxides, Particulate Matter and Toxic Air Contaminants from Portland Cement Manufacturing; and Adoption of a Negative Declaration pursuant to the California Environmental Quality Act

RECOMMENDED ACTION

Staff recommends that the Board of Directors take the following actions:

- Adopt Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter and Toxic Air Contaminants from Portland Cement Manufacturing; and
- Adopt a Negative Declaration pursuant to the California Environmental Quality Act (CEQA) for the proposed rule and amendments.

BACKGROUND

The proposed rule will implement control measure SSM-9 in the 2010 Clean Air Plan. Proposed Regulation 9, Rule 13 sets standards for emissions of nitrogen oxides (NOx), particulate matter (PM), and toxic air contaminants (TAC) from Portland cement manufacturing. This industrial process consists of a series of steps that transform raw materials (limestone, sand, alumina and iron ore) into cement clinker (grayish-black pellets the size of marbles or golf balls) that is then ground into a fine powder and mixed with gypsum and other additives to form powdered Portland cement. The bulk of the raw materials are mined at a nearby quarry, ground, blended, and then subjected to intense heat in a kiln to cause a series of chemical reactions, transforming it into cement clinker. The sole facility in the Air District affected by this rule is the Lehigh Southwest Cement plant located near Cupertino in unincorporated Santa Clara County. The Lehigh facility is subject to Regulation 2 and has a Title V permit from the Air District. This facility is the largest source of NOx emissions in the Air District without modern NOx controls.

Lehigh has been the subject of a number of complaints from nearby residents. The Air District has conducted extensive air quality monitoring in Cupertino to better understand local air quality conditions. The Air District and the United States Environmental Protection Agency (EPA) installed monitors between July 2009 and August 2010 to measure hexavalent chromium at an elementary school approximately two miles from Lehigh. The Air District monitored PM levels near Stevens Creek Boulevard for two years from October 2008 and installed a comprehensive ambient air monitoring station at Monta Vista Park in September 2010. The station measures PM (PM_{10} and $PM_{2.5}$), carbon monoxide, nitrogen dioxide and ozone and TAC including

benzene, mercury and a variety of other heavy metals and organic compounds. The monitoring results are available for public review on the Air District website at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Special-Reports.aspx.

Portland cement manufacturing facilities are subject to certain federal regulations. In August, 2010, EPA promulgated amendments to the National Emissions Standard for Hazardous Air Pollutants (NESHAP) that would affect all cement manufacturing plants in the U.S. The amended NESHAP addresses TAC, specifically mercury, hydrochloric acid, PM, total hydrocarbons, and dioxins and furans. The Portland Cement Association and cement manufacturers filed appeals with EPA and in federal court. EPA and the cement industry reached a settlement agreement earlier this year, and EPA re-proposed amendments to the NESHAP in June, 2012. Final action is expected in early 2013.

DISCUSSION

Proposed Regulation 9, Rule 13 will set the following limits for emissions from cement kilns:

- 2.3 pounds NOx per ton of cement clinker averaged over 30 days;
- 0.04 pounds PM per ton of cement clinker, averaged over 3 one-hour test runs;
- 0.2 nanograms dioxins/furans per standard cubic meter, averaged over 24 hours;
- 55 pounds mercury per million tons clinker produced;
- 3 parts per million by volume of hydrochloric acid;
- 24 parts per million total hydrocarbons, averaged over 30 days; and
- 10 parts per million by volume of ammonia above baseline concentrations.

In addition, the proposed rule would set a visible opacity standard of 10% for operations other than the cement kiln and clinker cooler (these equipment are subject to a 20% standard in Regulation 6, Rule 1). The proposed rule would set a number of operational requirements to reduce fugitive dust from quarrying, conveying and transport operations. The proposed rule would require that emissions enter the atmosphere from a stack that has been demonstrated through a Health Risk Assessment to pose a risk to the surrounding community below the notification threshold established under the Air Toxics "Hot Spots" Information and Assessment Act requirements set forth in California Health and Safety Code Section 44300 et al. The proposed standards would become effective on September 9, 2013.

RULE DEVELOPMENT PROCESS

Staff has conducted an extensive rule development process, involving Lehigh cement industry experts, elected local government officials, members of the public, representatives of environmental organizations, and California Air Resources Board and EPA staff. Air District staff posted a draft rule and workshop report November 17, 2011 and conducted a public workshop on the draft proposal in Cupertino on December 12, 2011. Staff revised the proposal in response to comments received. Staff reported on the rule development process to the Stationary Source Committee on July 23, 2010 and provided the Committee with a facility status report on Lehigh on March 19, 2012. The facility status report was updated and staff reported on the rule development efforts at a special meeting of the Board of Directors held on May 21, 2012 in Cupertino, CA. Appendix A to the staff report, "BAAQMD Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing"

contains letters from Bay Area cities and comments received from the May 21 meeting and responses.

On July 20, 2012, the final proposed rule, a staff report, California Environmental Quality Act analysis and draft negative declaration, and a socioeconomic analysis were published for comment. The comments received and responses are included as Appendix B of the staff report.

EMISSION REDUCTIONS AND ENVIRONMENTAL IMPACTS

Staff estimates that the proposed rule would reduce NOx emissions by 1.95 tons per day. PM would be reduced by 3.3 pounds per day, not including the fugitive dust controls. Total hydrocarbons would be reduced by 54 pounds per day, hydrochloric acid would be reduced by 125 pounds per day and mercury would be reduced by 0.67 pounds per day.

Pursuant to the California Environmental Quality Act, the Air District has had an initial study for the proposed rule prepared by Environmental Audit, Inc. of Placentia, California, and this initial study concludes that there are no potential significant adverse environmental impacts associated with the proposed rule. A negative declaration (Appendix D to the staff report) is proposed for approval by the Air District Board of Directors. No comments on the CEQA document have been received.

ECONOMIC IMPACTS

The cost effectiveness for the NOx control is $1,828 per ton of NOx reduced. Although the NOx control is very cost effective (most NOx rules have a cost effectiveness in excess of $10,000 per ton), the socioeconomic analysis performed by Bay Area Economics of Emeryville, California has found the costs to be significant. The socioeconomic analysis relies on IRS data for the cement industry and other publicly available data such as annual reports for public companies. The analysis compares the cost of the proposal to the taxable profits, and if the costs exceed 10%, costs are considered significant. As reported in the analysis, attached as Appendix C to the staff report, costs for the NOx control and costs for the TAC control both exceed 10% of taxable profits. Lehigh has not commented that NOx emissions controls to meet the proposed standard are prohibitively expensive.

Lehigh has already constructed the equipment to control TAC emissions. Lehigh will incur these costs under the federal rule, but the Air District proposal requires operation of the control equipment two years earlier than under the federal rule, at which time all the other cement manufacturers in the US will incur the same costs. Staff recommends the earlier compliance date to reduce the impacts of TAC on Bay Area residents. Lehigh is one of the only cement manufacturing plants in the U.S. operating in an urbanized area.

BUDGET CONSIDERATIONS/FINANCIAL IMPACTS

The facility is permitted and Air District staff already inspects the affected facility for compliance with other rules. The adoption of this rule will not require additional Air District resources.

Respectfully submitted,

Jack P. Broadbent
Executive Officer / Air Pollution Control Officer

Prepared by: Robert Cave
Reviewed by: Henry Hilken

Attachments:

Proposed Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter and Toxic Air Contaminants from Portland Cement Manufacturing

Staff Report, including Appendices:

A. Letters from Cities and Written Comments Received at May 21 Board of Directors' Special Meeting and Responses
B. Comments on Final Proposal and Responses
C. Socioeconomic Analysis
D. CEQA Initial Study and Negative Declaration
E. March 29, 2011 Letter from Jack Broadbent, Executive Officer of the Air District, to Supervisor Liz Kniss, Santa Clara County Board of Supervisors

REGULATION 9
INORGANIC GASEOUS POLLUTANTS
RULE 13
NITROGEN OXIDES, PARTICULATE MATTER, AND TOXIC AIR CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

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REGULATION 9
INORGANIC GASEOUS POLLUTANTS
RULE 13
NITROGEN OXIDES, PARTICULATE MATTER, AND TOXIC AIR CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

9-13-100 GENERAL

9-13-101 Description: This rule limits the emissions of nitrogen oxides, particulate matter, and toxic air contaminants from the manufacture of Portland cement.

9-13-200 DEFINITIONS

9-13-201 24-Hour Rolling Average: The arithmetic mean of the emissions as prescribed in Section 9-13-301 of the most recent 24 hours of operation of the kiln. Each hour initiates a new rolling average period.

9-13-202 30-Operating Day Rolling Average: The arithmetic mean of the emissions as prescribed in Section 9-13-301 of the most recent 30 operating days. Each operating day initiates a new rolling average period.

9-13-203 Adequately Wetted: Sufficiently moistened with water to minimize the release of particulate matter into the ambient air as determined by the provisions of Section 9-13-611.

9-13-204 Clinker: The product of feedstock sintered in a kiln which is then ground and mixed with additives to make cement.

9-13-205 Clinker Cooler: Equipment into which clinker leaving the kiln is placed to be cooled by air supplied by a forced draft or natural draft supply system.

9-13-206 Dioxins and Furans (D/F): Tetra-, penta-, hexa-, hepta-, and octa-chlorinated dibenzodioxins and furans.

9-13-207 HEPA Filter: High Efficiency Particulate Air filter used to remove particles less than 1 micron in diameter operating at removal efficiencies of 99.9 percent or greater.

9-13-208 Kiln: Any device including associated preheater and precalciner devices that produce clinker by heating limestone and other raw materials for subsequent production of Portland cement.

9-13-209 Miscellaneous Operations: Any activity performed at the facility that could generate emissions of fugitive dust. Examples of miscellaneous operations include: material conveyance and transporting, vehicular traffic, shoveling and sweeping, and material storage.

9-13-210 Nitrogen Oxides (NOx) Emissions: The sum of nitric oxide (NO) and nitrogen dioxide (NO_2) in the flue gas, collectively expressed as nitrogen dioxide.

9-13-211 **Operating Day:** A calendar day during which Portland cement is manufactured by the kiln. An operating day includes all valid data obtained in any daily 24-hour period during which the kiln operates and excludes any measurements made during the daily 24-hour period when the kiln was not operating or was in startup or shutdown.

9-13-212 **Particulate Matter:** Any material that is emitted as liquid or solid particles or gaseous material which becomes filterable at the testing temperatures specified in the referenced test method.

9-13-213 **Portland Cement Manufacturing Facility:** Any facility that produces Portland cement or associated products, as defined in the Standard Industrial Classification Manual as Industry Number 3241, Portland Cement Manufacturing.

9-13-214 **Shutdown:** The period of time between when kiln raw material feed and fuel to the kiln begin to be decreased to reduce the kiln operating temperature until both feed and fuel are no longer fed into the kiln and it has ceased operation. A shutdown period shall not last more than 24 hours.

9-13-215 **Startup:** The period of time between when fuel is first introduced into the kiln to heat it and when the kiln operating temperature reaches normal operating limits and raw material feed begins. A startup period shall not last longer than 36 hours.

9-13-216 **TEQ:** The international method of expressing toxicity equivalents for dioxins and furans as defined in U.S. EPA, Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and –dibenzofurans (CDDs and CDFs) and 1989 Update, March 1989.

9-13-217 **Total Hydrocarbon (THC):** For the purposes of this rule, total hydrocarbon emissions measured as propane, that also serve as a surrogate for the emissions of organic HAP compounds, as measured in accordance with Section 9-13-606.

9-13-218 **Total Organic HAP:** For the purposes of this rule, the sum of the concentrations of compounds of formaldehyde, benzene, toluene, styrene, m-xylene, p-xylene, o-xylene, acetaldehyde, and naphthalene as measured in accordance with Section 9-13-607.

9-13-219 **Track-Out:** Any bulk material that adheres to or agglomerates on the exterior surfaces of motor vehicles, haul trucks, and/or mobile equipment, including tires and that has fallen or been deposited onto a paved public roadway.

9-13-300 STANDARDS

9-13-301 **Emission Limits:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility unless the following emission limits are met:

301.1 The 30-operating day rolling average of nitrogen oxides (NOx) emissions from the kiln shall not exceed 2.3 pounds per ton of clinker produced;

301.2 Particulate matter (PM) emissions from the kiln shall not exceed 0.04 pounds per ton of clinker produced, based on a three run test average;

301.3 PM emissions from the clinker cooler shall not exceed 0.04 pounds per ton of clinker produced, based on a three run test average;

301.4 The 24-hour rolling average of ammonia (NH_3) emissions from the kiln shall not exceed baseline emission levels by more than 10 ppmv, dry at 7 percent oxygen;

301.5 The 24-hour rolling average dioxins and furans (D/F) emissions from the kiln shall not exceed 0.2 ng-TEQ/dscm at 7 percent oxygen;

301.6 The 30-operating day rolling average of mercury emissions from the kiln shall not exceed 55 pounds per million tons of clinker produced;

301.7 The 30-operating day rolling average of total hydrocarbon (THC) emissions from the kiln shall not exceed 24 ppmv, dry at 7 percent oxygen; or as an alternative, provided the provisions of Section 9-13-403 have been completed, the 30-operating day rolling average of total organic HAP emissions from the kiln shall not exceed 12 ppmv, dry at 7 percent oxygen;

301.8 The 30-operating day rolling average hydrogen chloride (HCl) emissions from the kiln shall not exceed 3 ppmv, dry at 7 percent oxygen.

9-13-302 **Opacity:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility with emissions to atmosphere from any miscellaneous operation or emission point other than from the kiln or clinker cooler that are equal to or greater than ten percent opacity for more than three minutes aggregated in any one-hour period, determined in accordance with Section 9-13-609, or half as dark in shade as that designated as Number 1 on the Ringelmann Chart, as published by the United States Bureau of Mines. Emissions to the atmosphere from the kiln and clinker cooler are subject to the opacity limit in Regulation 6, Rule 1.

9-13-303 **Stack Requirements:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility unless emissions from the kiln are monitored as per Section 9-13-501 and enter the atmosphere from a point or points that, at maximum potential to emit, or maximum permitted emission level, when combined with other facility emissions, have been demonstrated not to exceed the notification threshold established under Air Toxics "Hot Spots" Information and Assessment Act requirements as codified in California Health and Safety Code Section 44300 et al. and the Districts' Air Toxics Hot Spots program.

9-13-304 **Fugitive Dust Mitigation Control Measures:** Any person operating a Portland cement manufacturing facility shall at a minimum implement the following measures to mitigate emissions of fugitive dust:

304.1 Accessed disturbed open areas and unpaved roads shall be watered as needed to maintain adequate wetness.

304.2 In areas that have not had vehicular traffic for more than 7 days, the exposed soils shall be stabilized by the use of water, aggregate, or non-toxic soil stabilizers. Vehicular access to these designated areas shall be limited through the use of signage and vehicular access barricades.

304.3 Ground covering on disturbed areas shall be reestablished as soon as reasonably possible through the use of aggregates, berms, or permanent blockage in combination with hydro-seeding or seeding and watering.

304.4 An operational water truck shall be onsite at all times to prevent fugitive dust emissions. Water shall be applied as needed to comply with Section 9-13-302 for all mining, aggregate, and cement plant operations. Application of

water may be curtailed during wet weather. All water truck operations shall be recorded in a District approved log and include date, times, locations and activities.

304.5 **Material Storage Piles:** Fugitive dust emissions from material storage piles shall be controlled by one or more of the following methods:

- **5.1** Fine, dry material not amenable to water applied dust suppression shall be covered and have wind breaks installed;
- **5.2** Water and/or soil stabilizers shall be employed to reduce windblown dust. Water may be supplied by water truck or water spray equipment; or
- **5.3** In areas surrounding material storage piles, soils shall be stabilized by the use of water, aggregate, or non-toxic soil stabilizers.

304.6 **Material Transfer Processes:** Fugitive dust emissions resulting from all transfer processes, including but not limited to the transfer of material to or from stockpiles, belt conveyors, front end loading equipment, vehicular transport, and bin transfer which involves a free fall of mined, purchased, or manufactured materials, shall be controlled by one or more of the following mitigation methods:

- **6.1** Drop heights shall be minimized for all front end loaders transferring materials for mobile transport (quarry truck, transfer truck, bulk truck);
- **6.2** Incorporation of wind breaks, enclosures, and area covers;
- **6.3** Installation of temporary or permanent water spray systems, or water truck incorporation to increase material moisture content and suppress fugitive dust emissions from infrequent material transfer operations; or
- **6.4** HEPA filter vacuuming of any spilled cement powder during cement bulk loading operations into mobile equipment.

304.7 **Track-out Prevention and Control:** The following mitigation methods shall be employed to prevent fugitive dust emissions from track-out:

- **7.1** All vehicles and equipment owned or operated by the Portland cement manufacturing facility shall be washed prior to exiting the facility onto public paved streets.
- **7.2** All other vehicles shall be washed prior to exit onto public paved streets if they have traveled on unpaved roads on the facility.
- **7.3** A street sweeper shall be operated at least once a day to remove visible track-out from the paved roadway between the plant entrance and the facility boundary.

304.8 **Vehicle Traffic Speed:** The speed of all vehicles and mobile equipment traveling within the facility shall be limited to 15 miles per hour (mph) or less. The operator of the facility shall provide training, signage, and maintain video and photographic monitoring, and speed sensors to ensure compliance with the posted speed limit. The operator of the facility shall maintain records demonstrating compliance with this provision through enforcement of the following actions in progressive order:

- **8.1** Customers or visitors found to be travelling in excess of the posted speed limit; 1) issue verbal warning; 2) facility access to be limited; and 3) facility access to be denied,
- **8.2** Employees found to be travelling in excess of the posted speed limit: 1) issue verbal warning; and 2) progressive discipline up to and including termination.

8.3 Contractors and subcontractors deemed to be travelling in excess of the posted speed limit: 1) issue verbal warning; and 2) site removal and future facility access denied.

304.9 Quarries: All quarried and graded materials shall be kept adequately wet to minimize airborne dust. Blasting shall not occur if hourly averaged wind speeds are 25 mph or greater.

304.10 Material Handling Equipment: At the start of each shift or material handling equipment start-up, the operators shall assess the operational status of the water spray abatement equipment or confirm that the materials are sufficiently wet as to not require water spray abatement and record these determinations in a district approved log.

304.11 Housekeeping and Material Cleanup: All housekeeping activities shall be performed so as to minimize fugitive dust emissions.

304.12 Training: Employees, contracted and subcontracted personnel shall be initially and at least annually thereafter be trained on techniques and best management practices to avoid fugitive dust emissions. Training shall include all relevant procedures identified in facility plans including but not limited to the Fugitive Dust Control Plan, and Operation and Maintenance Plan, and Preventative Maintenance Program for Dust Control. Records shall be maintained to demonstrate compliance with this provision.

9-13-400 ADMINISTRATIVE REQUIREMENTS

9-13-401 Initial and Annual Demonstration of Compliance: No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement shall conduct an initial demonstration of compliance with Section 9-13-301 by conducting a source test according to the methods referenced in Sections 9-13-601 through 608. An annual demonstration of compliance with Sections 9-13-301.1 through 301.4, 301.6 and 301.8 shall be conducted at least once each calendar year following the initial test, and not more than 15 months after the most recently conducted annual demonstration of compliance. A demonstration of compliance with Sections 9-13-301.5 and 301.7 shall be conducted at least once every 30 months.

9-13-402 Baseline Ammonia Emission Level Determination: No later than 90 operating days after rule adoption, any person manufacturing Portland cement shall begin monitoring ammonia emissions from the kiln for the purpose of establishing a baseline emission level for kiln operations prior to the installation and subsequent operation of NOx control equipment. Monitoring shall be conducted according to Section 9-13-501, and determination of the baseline ammonia emission level shall be calculated as specified in regulation 9-13-610.

9-13-403 Total Organic HAP Emissions Test: No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement seeking to satisfy the alternative emission limit in Section 9-13-301.7, shall conduct a source test to determine emissions of total organic HAP according to the methods referenced in Section 9-13-607. Each source test shall consist of three separate runs conducted for at least 1 hour. Concurrent with the source test, THC emissions shall be determined by operating the parametric monitor specified in Section 9-13-501.2. The duration of the source test shall be 3 hours and the average THC concentration during the 3-hour test shall be calculated. A correlation between Total Organic HAP

and THC concentrations shall be determined based on these results. This correlation procedure shall be conducted thereafter at least once every 30 months.

9-13-404 **Health Risk Assessment:** Prior to construction or modification to emission points from the kiln or clinker cooler, the operator of a Portland cement manufacturing facility shall complete and submit to the District a health risk assessment conducted according to Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. District review of the HRA shall be conducted concurrent to review of application of authority to construct and permit to operate submitted for emission point modifications.

9-13-405 **Dioxins and Furans Emissions Test:** No later than 30 operating days after September 9, 2013, any person manufacturing Portland cement shall conduct a source test to determine emissions of dioxins and furans (D/F) according to the methods referenced in Section 9-13-604. Each source test shall consist of three separate runs conducted under representative conditions. Concurrent with the source tests, the temperature of the kiln exhaust gas at the inlet to the PM control device shall be determined by operating the parametric monitor specified in Section 9-13-501.2. The duration of each run shall be at least 3 hours and the average temperature during the 3-hour run shall be calculated. A correlation between D/F concentrations and temperature shall be determined based on these results. This correlation procedure shall be conducted thereafter at least once every 30 months.

9-13-500 **MONITORING AND RECORDS**

9-13-501 **Emissions Monitoring:** Any person who operates a Portland cement manufacturing facility subject to Section 9-13-301 shall provide, properly install, maintain in good working order, and operate the following emission monitoring equipment:

501.1 **Continuous Emissions Monitoring:** A continuous emission monitoring system (CEMS) for each emission point from the kiln, to demonstrate compliance with the provisions of this rule by measuring nitrogen oxides (NOx), and either oxygen (O_2) or carbon dioxide (CO_2). The CEMS shall meet the requirements of the District Manual of Procedures, Volume V, Continuous Emission Monitoring, Policy and Procedures. Each CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive fifteen (15) minute period.

501.2 **Parametric Monitoring:** Suitable instruments to monitor continuously for each emission point from the kiln, to demonstrate compliance with the provisions of this rule by measuring ammonia (NH_3), temperature for dioxins and furans (D/F), mercury (Hg), total hydrocarbon (THC), hydrochloric acid (HCl), operational integrity of PM control device, and volumetric flow. The parametric monitors shall meet the requirements specified in the most recent revision to 40 CFR, Part 60 and Appendices.

9-13-502 **Production Monitoring:** Any person who operates a Portland cement manufacturing facility subject to Section 9-13-301 shall determine hourly clinker production by one of the following two methods:

502.1 Provide, properly install, maintain in good working order, and operate permanent weigh scale system to measure and record weight rates of the

amount of clinker produced in tons of mass per hour. The system of measuring hourly clinker production shall be maintained within 5% accuracy, and the accuracy of the system shall be verified and recorded on a weekly basis. Hourly clinker production rates shall be totaled every 24 hours to provide a daily production rate.

502.2 Provide, properly install, maintain in good working order, and operate permanent weigh scale system to measure and record weight rates of the amount of feed into the kiln in tons of mass per hour. The system of measuring hourly feed into the kiln shall be maintained within 5% accuracy, and the accuracy of the system shall be verified and recorded on a weekly basis. Calculate the hourly clinker production rate using feed to clinker ratio based on reconciled clinker production determined for accounting purposes and recorded feed rates. This ratio shall be updated monthly. If the ratio is changed at monthly reconciliation, the new ratio shall be used to determine clinker production rates going forward but shall not change previously estimated production rates retroactively. Hourly clinker production rates shall be totaled every 24 hours to provide a daily production rate.

9-13-503 Records: Any person subject to the requirements of this rule shall keep records of the following:

503.1 The results of any source testing conducted to determine compliance with Section 9-13-301 as specified in Section 9-13-401.

503.2 The continuous emission monitoring system (CEMS) measurements for NOx, and diluents O_2 or carbon dioxide in ppmv; and hourly (lbs/hour) and daily (lbs/day) NOx emissions from the kiln.

503.3 The parametric monitoring measurements for NH_3, D/F, Hg, HCl, and THC; and hourly (lbs/hour) and daily (lbs/day) NH_3, Hg, HCl, and THC emissions from the kiln.

503.4 The clinker production rate in tons per day for each day of operation of the kiln.

503.5 The calculated NOx, PM, and Hg emission rates from the kiln in pounds per ton of clinker produced for each day of operation of the kiln.

503.6 The calculated PM emission rate from the clinker cooler in pounds per ton of clinker produced for each day of operation of the kiln.

503.7 The daily average NH_3, HCl, and THC concentration emitted in ppmv for each day of operation of the kiln.

503.8 The calculated Total Organic HAP concentration emitted in ppmv for each day of operation of the kiln.

503.9 The calculated daily average D/F concentration emitted in ng-TEQ/dscm for each day of operation of the kiln

503.10 The date, time, and duration of any startup, shutdown or malfunction in the operation of any unit, emissions control equipment or emission monitoring equipment.

503.11 The results of performance testing, evaluations, calibrations, checks, adjustments, and maintenance of all CEMS and parametric monitors required by this rule.

Such records shall be retained for a minimum of 60 months from date of entry and be made available to District staff upon request.

9-13-504 **Reporting Requirements:** A person subject to the requirements of Sections 9-13-301 shall meet the following reporting requirements:

504.1 Report to the APCO any exceedance of Section 9-13-301 in accordance with the requirements of Regulation 1-522 for continuous emission monitoring systems (CEMS), and Regulation 1-523 for parametric monitors.

504.2 Submit a written report for each calendar month to the APCO. The report shall be due on the 30th day following the end of the calendar month and shall include:

2.1 A summary of the data obtained from the CEMS or equivalent parametric monitoring system; and

2.2 The date, time, duration, and magnitude of emissions in excess of the appropriate standards; the nature and cause of the excess (if known); the corrective actions taken; and the preventive measure adopted.

9-13-600 MANUAL OF PROCEDURES

9-13-601 **Determination of Nitrogen Oxides:** Compliance with the emission limit of Section 9-13-301.1 shall be determined by the source tests specified in Section 9-13-401 using ST-13A (nitrogen oxides), ST-14 (oxygen), and ST-5 (carbon dioxide), and by the continuous emission monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of Volume V of the District Manual of Procedures and the federal requirements specified in the most recent revision of the Code of Federal Regulations, Title 40 (40 CFR), Parts 60, 63 and Appendices.

9-13-602 **Determination of Particulate Matter:** Compliance with the limits set forth in Section 9-13-301.2, and 301.3 shall be determined by the source tests specified in Section 9-13-401 using United States Environmental Protection Agency (EPA), Method 5 – Determination of Particulate Matter from Stationary Sources and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet either the requirements of EPA Fabric Filter Bag Leak Detection Guidance (1997) or the requirements of EPA performance specification 11 for PM CEMS, and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-603 **Determination of Ammonia:** Compliance with the ammonia emission limit of Section 9-13-301.4 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in District Manual of Procedures, Volume IV, ST-1B and EPA Method 350.3, and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of EPA Preliminary Performance Specification PPS-001 for Ammonia CEMS.

9-13-604 **Determination of Dioxins and Furans:** Compliance with the D/F emission limit of Section 9-13-301.5 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in EPA Method 23 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-605 **Determination of Mercury:** Compliance with the mercury emission limit of Section 9-13-301.6 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in District Manual of Procedures, Volume IV, ST-10, and by the parametric monitors that have been installed pursuant to Section 9-13-501

and meet the requirements EPA Performance Specifications 12A, or 12b and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-606 **Determination of Total Hydrocarbon:** The THC parametric monitors that have been installed pursuant to Section 9-13-501 shall meet the requirements of EPA Performance Specification 8A and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-607 **Determination of Total Organic HAP:** Compliance with the Total Organic HAP emission limits of Section 9-13-301.7 shall be determined by the source tests specified in Section 9-13-403 using the methods set forth in EPA method 320 or ASTM D6348-03 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-608 **Determination of Hydrochloric Acid:** Compliance with the hydrochloric acid emission limit of Section 9-13-301.8 shall be determined by the source tests specified in Section 9-13-401 using the methods set forth in EPA Method 320, 321 and by the parametric monitors that have been installed pursuant to Section 9-13-501 and meet the requirements of EPA Performance Specification 15 and the federal requirements specified in the most recent revision to 40 CFR, Parts 60, 63 and Appendices.

9-13-609 **Determination of Visible Emissions:** Visible emissions shall be determined by Manual of Procedures, Volume 1 – Enforcement Procedures, Part 1: Evaluation of Visible Emissions.

9-13-610 **Baseline Ammonia Emission Level Calculation:** The following methodology shall be used to calculate baseline ammonia emissions in order to determine compliance with Section 9-13-301.4:

610.1 The baseline period consists of the period immediately preceding the initial operation of control equipment installed to comply with Section 9-13-301.1. The baseline period shall not be less than 6 months in duration. The owner or operator of the Portland cement manufacturing facility shall have sufficient records of the kiln's operation to substantiate the emission rate during the baseline period.

610.2 Baseline emission level, expressed in ppmv, dry at 7 percent oxygen, is the median of the 6 monthly average values of the ammonia (NH_3) emissions from the kiln.

9-13-611 **Determination of Adequately Wetted:** A sample of at least one quart in volume shall be taken from the top three inches from the surface of unpaved road, bare area, or from the surface of a stockpile. The sample shall be poured out from a height of four feet onto a clean hard surface. The material shall be considered to be adequately wetted if there is no observable dust emitted when the material is dropped.

Bay Area Air Quality Management District

939 Ellis Street
San Francisco, CA 94109

Bay Area 2010 Clean Air Plan
Stationary Source Control Measure SSM-9

BAAQMD Regulation 9, Rule 13:

NITROGEN OXIDES, PARTICULATE MATTER, AND TOXIC AIR CONTAMINANTS FROM PORTLAND CEMENT MANUFACTURING

Staff Report
September 2012

Prepared by:

Robert Cave
Senior Air Quality Specialist
Planning, Rules and Research Division

ACKNOWLEDGEMENTS

The following District staff members participated in the development of the proposed amendments to this rule, and deserve recognition for their important contributions:

Brian Bateman – Compliance and Enforcement

Scott Beaver – Planning, Rules and Research

Thu Bui – Engineering

Kristina Chu – Communications and Outreach

Tony Gambardella – Compliance and Enforcement

John Marvin – Compliance and Enforcement

Dick Rodriguez – Compliance and Enforcement

Adan Schwartz – Legal

Eric Stevenson – Technical

Tim Underwood – Technical

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APPENDICES

1.0 Executive Summary

The Bay Area Air Quality Management District ("BAAQMD" or "District") is proposing adoption of Regulation 9, Rule 13: *Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing* ("Regulation 9-13" or "the rule"). This source category was identified for potential emissions reductions of nitrogen oxides (NOx) and particulate matter (PM) in the Bay Area 2010 Clean Air Plan, Stationary Source Control Measure SSM-9. The proposed rule sets emissions standards for NOx, PM, and toxic air contaminants (TACs). The rule also proposes modifications to the emissions stack of the kiln based on analysis of health risk effects to the surrounding community, and would impose fugitive dust control and mitigation measures at the facility to further reduce particulate emissions.

Portland cement manufacturing is a multi-billion dollar industry in the United States, with annual domestic consumption of over 500 pounds per person. One hundred plants across the country produce 85 to 90 percent of this total with imports accounting for the remaining portion. In August of 2010, the United States Environmental Protection Agency (EPA) issued final amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Portland Cement Manufacturing Industry. The revised NESHAP significantly reduces emissions of TACs from new and existing Portland cement kilns, but it has been challenged in Federal Court, and the effective date of the emissions standards may be delayed or the standards reduced in stringency, pending the final version to be issued in December of this year. In order to ensure that emissions of TACs from the manufacture of Portland cement are significantly reduced in the Bay Area, the 2013 effective date of the 2010 amended NESHAP has been retained in the proposed Regulation 9-13.

The Lehigh Southwest Cement Plant (Lehigh) located in unincorporated Santa Clara County, west of Cupertino is the only Portland cement manufacturing facility located in the District. One of the few cement plants in the country located in an urbanized area, it has been in operation since 1939, and has undergone many changes as the surrounding community has developed around it. The cement kiln at Lehigh currently represents the largest single source of NOx emissions in the District without modern add-on controls, emitting an average of 1700 tons of NOx per year. Emissions of TACs and PM, along with others from the plant have generated significant concern from the surrounding community. The most recent renewal of the Title V permit for the facility included a public hearing and two separate public comment periods from which the District received oral comments from 30 individuals and 75 written comments from individuals and organizations.

Adoption of the proposed rule would reduce emissions of NOx, PM, and TACs, and ensure environmental health protections for the surrounding community. The costs associated with the controls and other equipment modifications necessary to meet the standards and other provisions of the rule are not insignificant, but analysis shows the standards of the rule to be cost-effective and feasible considering their synthesis with impending federal standards. An independent analysis found the proposed rule to pose no adverse environmental impacts and a California Environmental Quality Act (CEQA) Negative Declaration is proposed.

2.0 Background

Portland cement is combined with water, gravel, sand, or other aggregate to form concrete, which is used in road building and a variety of other construction projects. Portland cement manufacture is a $10 billion per year industry in the United States. In 2008, Americans consumed 104 million tons of cement nationally, or 675 pounds per person for the year. Between 85% and 90% of that is produced in the United States with the rest imported primarily from China, Canada, Colombia, Mexico and Korea.

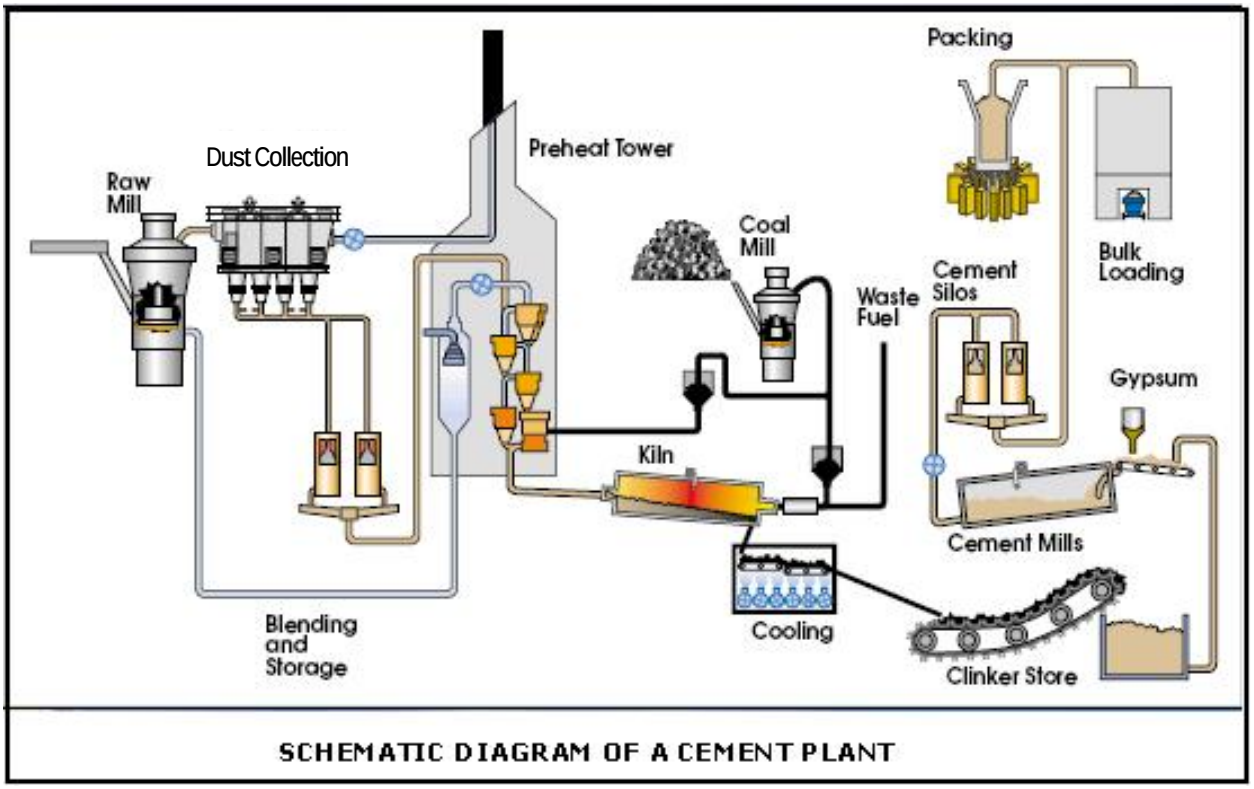
There are 108 Portland cement manufacturing plants operating in 36 states, with 11 in California, three in Northern California, and one in the Bay Area. Lehigh Southwest Cement Plant (Lehigh), located in unincorporated Santa Clara County, west of Cupertino, is the only cement manufacturing facility in the District. Consistent with national trends, Lehigh has reduced production annually since 2006. Their BAAQMD permit limits their production of clinker (a preliminary stage of cement) to 1.6 million tons per year, but in 2010 Lehigh produced 847 thousand tons of clinker, a little over half the permitted amount.

Portland cement manufacturing is the third largest industrial source of emissions of NOx and sulfur dioxide (SO_2) in the nation at 180 thousand tons per year. Lehigh is the Bay Area's largest source of NOx emissions without modern NOx controls such as ultra-low NOx burners, staged combustion, or add-on controls such as catalytic reduction. This facility emitted 1,798 tons of NOx and 181 tons of SO_2 in 2008. The plant has been in operation since 1939, and is subject to a variety of District, State, and federal air quality rules and regulations. District staff has evaluated more stringent standards for NOx, PM, and SO_2. In addition, U.S. EPA has adopted amendments to federal rules affecting this facility, initially with compliance due in September of 2013; however, in June of this year, EPA proposed revisions to some of the emissions limits, monitoring methods, and compliance dates for the rules with final approval for these revisions set for December 20, 2012. Staff has evaluated the standards and compliance deadlines of these federal rules to ascertain their application to this facility and to determine what additional technologies and/or methodologies could be employed to reduce emissions of air pollutants in a cost effective manner.

Portland Cement Kiln Overview

Portland cement is a fundamental ingredient of concrete, consisting of calcium, silicon, aluminum, and iron. These materials are combined in a number of steps requiring careful control to ensure that the final product meets specific chemical and physical specifications required for building and construction needs. Figure 1 shows a schematic diagram of Portland cement manufacturing.

Figure 1 – Schematic of Cement Manufacturing Process



Manufacturing Steps

Portland cement manufacturing is a series of steps which take place at a large industrial facility usually located adjacent to a source of raw materials. Raw materials consist of limestone, shells or chalk, clay, sand, alumina and iron ore. The bulk of these are mined at a quarry, blended, and ground to a powder. This blended material is subjected to intense heat in a kiln to cause a series of chemical reactions, transforming the powdered raw materials into something called cement clinker. Cement clinker consists of grayish-black pellets the size of marbles or golf balls, which is cooled, ground and mixed with gypsum and other additives to form powdered Portland cement.

In the initial manufacturing step, limestone is mined from a quarry near the plant. At the quarry, the material is reduced to a manageable size (from chair or desk size to softball size) by a two-stage primary crusher before stockpiling and transport to the kiln. The limestone is crushed for a third time and then pre-blended to homogenize the quality of the limestone. It is then mixed with bauxite (a source of alumina) and iron ore before being ground inside a ball mill and further blended to create the required proportions necessary for the desired end product.

In older cement manufacturing plants water is added to the raw materials to form a slurry, and grinding and mixing operations are completed in a slurry form. This aids in conveying the material, but the dry method is ultimately more energy efficient. The Lehigh facility converted from wet to dry process in 1981. In order to produce clinker the material must be heated to at

least 2400 degrees Fahrenheit and this is much easier when the raw materials are dry. At modern plants, the materials are preheated before entering the kiln and at many facilities the process of making cement is begun at this stage in a process called precalcining. A preheater/precalciner tower is utilized at the Lehigh facility to heat the material to approximately 1650 degrees F, and begin the cement manufacturing process prior to the material entering the rotary kiln.

At the heart of the manufacturing process is the cement kiln. The blended mixture of raw material is fed from the preheater/precalciner into the upper end of a tilted rotating cylindrical kiln where it will reach temperatures of 2400 to 3000 degrees F. This intense heat causes the material to fuse and undergo chemical reactions to create cement clinker. The clinker is discharged from the lower end of the kiln where it is cooled and then ground into a fine powder. Some of this heat is recovered at this stage and routed to the preheater. The ground clinker is mixed with gypsum and ground one final time to make the final product.

Emissions from Portland Cement Manufacturing

The manufacturing of cement requires the movement and processing of many tons of material as well as the combustion of large amounts of fuel in order to heat that material to extremely high temperatures. Emissions of pollutants are directly attributable to both the fuel combustion and materials processing. The formation of NOx during the manufacture of cement is due to the high temperature, oxidizing atmosphere necessary for clinker formation. Emissions of TACs arise from the presence of these compounds predominantly in the raw materials and to a lesser extent the fuel to fire the kiln. Predominant TACs emitted include mercury, hydrochloric acid (HCl), benzene, dioxins and furans, and dependent on the raw materials used, metals such as lead and hexavalent chrome. Particulate emissions arise from crushing, mixing and storage of raw materials, clinker production and cooling, finish grinding, packaging, and from vehicle traffic.

NOx is linked with a number of adverse effects on the respiratory system. It is a major precursor to the formation of ground level ozone and also a precursor to secondary fine particulate formation. Ozone can worsen the effects of bronchitis, emphysema, and asthma, and is the primary component of photochemical smog. Exposure to fine particulate matter is by far the leading public health risk in the Bay Area, accounting for more than 90% of premature mortality related to air pollution. Coarse particulate can exacerbate respiratory ailments in addition to nuisance complaints.

For the most part, emissions of metallic TACs are limited at Lehigh due to low levels in raw materials and fuel used at the plant, combined with the high level of control from fabric filtration systems in use at the plant. Mercury emissions are more significant than other metallic TACs due to relatively high mercury levels in the limestone quarried at the facility and because the metal is volatilized by the high temperatures of the kiln. Mercury can damage the central nervous system, kidneys, and liver. Short-term or acute exposure can cause skin rashes, diarrhea and respiratory distress. Chronic exposure can cause muscle tremors, irritability, personality changes, and nerve damage ranging from loss of sensitivity in hands and feet to difficulty in walking, slurred speech, and in severe cases paralysis and death. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methyl mercury has caused kidney tumors in male mice.

Other TACs emitted from the kiln include hydrochloric acid (HCL), dioxins, furans, and benzene. HCl may cause eye, nose and respiratory tract irritation and inflammation at acute exposures and chronic exposure at lower concentrations may lead to gastritis, chronic bronchitis, and skin problems. Exposure to dioxins and furans can cause skin disorders, liver problems, impairment of the immune system and effects on the developing nervous system. Long term exposure to benzene causes harmful effects on bone marrow, a decrease in red blood cells, and can impair reproductive organ function in some women. Dioxin, furans, and benzene are all recognized to cause carcinogenic effects from long term exposure.

Federal Regulations

Two federal rules address air emissions from the manufacture of Portland cement: New Source Performance Standards (NSPS) and National Emission Standard for Hazardous Air Pollutants (NESHAP). EPA generally promulgates NSPS for specific industrial operations to address emissions of criteria pollutants from new, modified, and reconstructed sources. NESHAP addresses emissions of TACs (also known as hazardous air pollutants) from both new and existing sources, and may have separate standards for each case.

The NSPS for Portland cement manufacture was originally promulgated in 1971, and has been amended many times. Clean Air Act amendments of 1977 require a quadrennial review of all NSPS and, if deemed appropriate, EPA revises the standard. The most recent amendments to the NSPS were proposed in June of 2008 and finalized in August of 2010. The previous standard remains in effect for all sources constructed after 1971. For facilities constructed, modified or reconstructed after June 6, 2008, emissions standards have been made more stringent, and the monitoring methodology has been modified. EPA is requiring continuous emission monitoring systems (CEMS) for each of the three pollutants covered under the NSPS (PM, NOx, and SO_2). Because the Lehigh facility has not been modified or reconstructed after June 6, 2008, it is not subject to the new emissions standard (modifications to the kiln in 1981 make them subject to the 1979 standard).

EPA initially issued the NESHAP for Portland cement manufacture in 1999 to limit emissions of PM as a surrogate for certain toxic metals contained in cement kiln and clinker cooler PM, to limit dioxin/furan emissions, and to set a hydrocarbon limit for new kilns. Several organizations filed petitions for judicial review of that rule. In 2000, the US Court of Appeals remanded parts of the 1999 standard and instructed EPA to consider standards for hydrochloric acid (HCL), mercury, total hydrocarbons, and metallic hazardous air pollutants. In December of 2006, EPA issued final amendments to the NESHAP to set limits for mercury and total hydrocarbons for kilns built after December 2, 2005 and to require that existing kilns meet “work practice” standards to reduce emissions of mercury and hydrocarbons. In a separate December 2006 action, EPA announced that it would reconsider the emission limits for mercury and total hydrocarbons for new cement kilns. Prior to that action, EPA had been sued by the cement industry, environmental groups, and state environmental agencies on the final amendments, and also received petitions to reconsider the existing source standards for mercury, hydrocarbons, and the decision not to regulate HCl. On April 21, 2009 EPA proposed to amend the NESHAP to reduce emissions of mercury, total hydrocarbons, HCl, and PM from both new and existing cement kilns.

On August 6, 2010, EPA issued final amendments to both rules. These were then appealed directly to EPA, and further challenged in Federal Court. On June 22, 2012, as part of a settlement agreement, EPA revised its proposed emissions limits for PM and Organic HAPs, and made changes to monitoring requirements and extended the compliance date to September 10, 2015. The revised NESHAP significantly reduces hazardous (toxic) emissions from new and existing Portland cement kilns, and the NSPS further limits criteria pollutant emissions from new and modified operations. Table 1 illustrates the standards in the federal NSPS for NOx, SO_2, and PM; and Table 2 shows the NESHAP limits.

Table 1 – 2012 New Source Performance Standards	
Pollutant	Emission Limit
Oxides of Nitrogen (NOx)	1.5 lb/ton of clinker, averaged over 30 days
Sulfur Dioxide (SO_2)	0.4 lb/ton of clinker, averaged over 30 days
Particulate Matter (PM)*	0.02 lb/ton of clinker, averaged over 30 days

Table 2 – 2012 National Emission Standards for Hazardous Air Pollutants		
Pollutant	Existing Facilities	New and Modified Facilities
Mercury	55 lbs/million tons of clinker, averaged over 30 days	21 lbs/million tons of clinker, averaged over 30 days
Dioxins/Furans*	0.2 nanograms/dry standard cubic meter (ng/dscm)(TEQ), averaged over 24 hours	0.2 ng/dscm (TEQ)*, averaged over 24 hours
Total Hydrocarbons	24 parts per million by volume (ppmv), averaged over 30 days	24 ppmv, averaged over 30 days
Total Organic HAP*	12 parts per million by volume (ppmv), averaged over 30 days	12 ppmv, averaged over 30 days
Particulate Matter (PM)*	0.07 lb/ton of clinker, averaged over 30 days	0.02 lb/ton of clinker, averaged over 30 days
Hydrochloric Acid (HCL)	3 ppmv, averaged over 30 days	3 ppmv, averaged over 30 days

**NOTES: The PM standards were raised from 0.01, and 0.04 to 0.02, and 0.07 in the June 2012 proposed revision. The Total Organic HAP standard was raised from 9 to 12 in the June 2012 proposed revision. The Total Organic HAP standard is an alternative to the Total Hydrocarbon Standard. The Dioxin/Furan standard is unchanged from the previous NESHAP standard. Toxic Equivalent (TEQ) weighs the toxicity of less toxic compounds as fractions of the most toxic compound of the group.*

The amended NESHAP will reduce emissions of mercury, total hydrocarbons, HCl, and PM from both new and existing kilns. EPA estimates that by that date the NESHAP will result in national emissions reductions from cement kilns of 92% for mercury, 83% for total hydrocarbons, and 97% for HCl. The federal regulation would reduce emissions at the Lehigh facility by approximately the following amounts: 93% for mercury; 91% for total hydrocarbons;

and 70% for HCl. The Lehigh facility is not "new or modified" and so only the amended NESHAP limits would apply and not the amended NSPS limits.

Legislation has been passed by the US House of Representatives and been introduced in the Senate to stay or rescind these federal regulations. As stated previously, the NESHAP was challenged in Federal Court, and a settlement agreement was reached in April of this year between EPA and the Portland Cement Association and several cement manufacturers. The agreement stayed the litigation and stipulated that EPA publish a notice of proposed rulemaking that addresses the concerns raised regarding the standards and will either propose a two year delay, or leave the NESHAP unchanged and solicit comments on potentially extending the compliance deadline to 2015.

On June 22, 2012, EPA proposed revisions to the emissions standards for PM and Organic HAPs, the methods of determining compliance for PM, and the compliance date. The PM standards were changed from 0.01 pounds per ton of clinker for new kilns, and 0.04 pounds per ton of clinker for existing kilns, to 0.02 pounds per ton of clinker, and 0.07 pounds per ton of clinker. In addition, these limits are no longer averaged over 30 days, but rather over three source test runs, since the revised rules do not rely on a PM CEMS. The standard for Organic HAPs was raised from 9 ppmv to 12 ppmv, but the averaging period remains the same. The date of Compliance was changed from September 9, 2013 to September 10, 2015, to allow facilities more time to install emissions controls in order to comply with the rule requirements.

California Regulations

All cement kilns operating in California are subject to permitting by the local air district. Major sources of air pollution like the Lehigh facility are required to obtain Title V operating permits which incorporate the applicable NESHAP, NSPS and District regulations. There are currently no State rules that specifically regulate cement manufacture, other than greenhouse gas emissions reporting requirements and those rules governing the use of scrap tires as fuel. Several air districts (Antelope Valley, Amador, Kern, Mojave, and Monterey Bay Unified) with cement kilns operating within their jurisdiction have adopted regulations to address emissions of NOx and/or PM from these sources. South Coast Air Quality Management District has adopted several cement manufacturing regulations addressing emissions of NOx, PM, and CO, as well as hexavalent chromium and fugitive dust. At least two of these regulations were adopted to address specific conditions at individual cement manufacturing facilities.

Applicable BAAQMD Regulations

While there is currently no BAAQMD rule which specifically addresses cement manufacturing operations, these operations are subject to a number of District regulations that govern permitting (e.g., Regulation 2-1, 2-2), emissions of toxic or hazardous compounds (Reg. 2-5), and some general or miscellaneous regulations for individual pollutants (Reg. 6-1 for PM, Reg. 8-2 for Volatile Organic Compounds (VOCs), Reg. 9-1 for SO_2, and Reg. 11-1 for lead). Requirements of these rules are incorporated into the Title V permit for Lehigh along with the applicable federal requirements of the NESHAP and NSPS.

3.0 Technical Review

Controlling Emissions from Cement Manufacturing

The manufacturing of cement requires the movement and processing of many tons of material as well as the combustion of large amounts of fuel in order to heat that material to extremely high temperatures. Emissions of pollutants are directly attributable to both the fuel combustion and materials processing. Any improvements to the efficiency of the material handling processes as well as the delivery of heat can result in a reduction in emissions to the atmosphere. Over many years of operation Lehigh has implemented efficiency related modifications to their process as the state-of-the-art of cement manufacturing has developed. The facility has switched from a wet to a dry process, introduced heat recovery methods, and installed a precalcining tower. The driving force behind these modifications has been financial, but the improved efficiency has also reduced emissions. There do not appear to be any obvious additional modifications of this type that might be undertaken at this time. Add-on emissions control or improvements to existing emissions control devices hold far greater potential to reduce emissions in a cost effective manner.

NOx Emissions Control

The formation of NOx during the manufacture of cement is due to the high temperature, oxidizing atmosphere necessary for clinker formation. NOx is primarily formed by two mechanisms: the oxidation of molecular nitrogen in the combustion air or "thermal NOx"; and the oxidation of nitrogen compounds in the fuel or "fuel NOx". Although the contribution of fuel NOx cannot be discounted, in the high temperature zone of cement kilns, thermal NOx is the dominant contributor to NOx formation. Additionally, some NOx may be formed by oxidation of nitrogen compounds from the raw materials or "feed NOx", and a small amount of NOx is formed instantaneously at the flame surface or "prompt NOx." The predominant nitrogen species in cement kiln exhaust gas is NO, at typically up to 90-95%, with NO_2 accounting for the remainder.

A number of post-combustion or add-on control techniques have proven successful at removing NOx in exhaust streams from a variety of industrial combustion sources. These include scrubbing technology utilizing various chemical additives, oxidation technology utilizing hydrogen peroxide, and selective reduction technology utilizing ammonia or urea injection either with or without a catalyst present. The applicability of these add-on NOx controls to the exhaust from cement kilns is somewhat limited by high temperature, high flow rate, and high level of particulate in the exhaust. The cost, availability, and handling requirements of the chemical additives can further restrict their usefulness in this application. The two post-combustion techniques that present the greatest likelihood of successful NOx reduction from cement kiln exhaust are selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR). Both SNCR and SCR utilize a nitrogen based reducing agent (usually ammonia or urea) to convert NOx into molecular nitrogen (N_2) and water vapor (H_2O).

Use of either SNCR or SCR would require substantial equipment upgrades as well as operational modifications to any cement manufacturing plant. Operational plans and equipment are required for the delivery, storage, and mixing of the ammonia-based reagent. The complexity of this depends on the form of the reagent used. The performance of these systems is highly dependent on temperature, residence time, and concentration of the applied reagent. Control systems to monitor these variables as well as CEMS for NOx and ammonia are required to determine the optimum conditions to maximize NOx control and minimize emissions of unreacted ammonia. Emissions to the atmosphere of unreacted ammonia resulting from the use of SNCR and SCR are referred to as "ammonia slip" and can result in odor concerns, stack plume visibility problems and secondary PM formation. Additional issues associated with poorly managed SNCR systems at cement plants include the potential for increased emissions of carbon monoxide (CO), and N_2O (more likely when using urea as a reagent).

SNCR has proven an effective means of NOx control at a number of cement kilns across Europe, Japan, and the United States. The first trial use of this technology in cement manufacturing occurred in Europe in 1979, with further trials carried out at cement plants in Europe and Japan throughout the 1980s. As of 2007, over 60 cement plants across Europe utilized SNCR for the control of NOx emissions achieving control efficiencies in excess of 50%. Higher NOx reduction efficiencies are possible when SNCR is paired with staged combustion or some other combustion modification. In the United States, the application of SNCR to cement kilns is more recent and initially only proved successful on preheater/precalciner kilns. However, there are currently several cement plants across the country utilizing SNCR including wet kilns, long kilns and those using waste derived fuels. Reported NOx control efficiencies for the US applications run from 12% to 65%. Higher efficiencies are generally associated with higher concentrations of ammonia added to the flue gas, and this often results in greater ammonia slip (emissions of unreacted ammonia).

SCR has proven an effective means of NOx control for a variety of combustion sources, from gas turbines at power plants to industrial boilers to diesel locomotives and even automobiles. The application of this technology to cement kilns is much more limited. Primarily, this is due to the high levels of dust in cement kiln gas at the temperature favorable for SCR use. In determining emissions levels for the NSPS, EPA considered lower NOx levels based on performance of SCR, but determined that SCR was not "sufficiently demonstrated technology for this industry."

PM Emissions Control

Particulate emissions arise from a variety of activities at cement manufacturing facilities, some of which are amenable to collection and control by add-on systems and some of which are fugitive in nature (i.e., not emitted from a stack) but which may be nevertheless reduced by mitigation methods. Dust sources amenable to collection and control include crushing, mixing and storage of raw materials, clinker production and cooling, finish grinding, and packaging. Of these sources, the largest single point of emissions are the stack emissions from the kiln including the feed system, fuel firing, and clinker cooling and handling systems. Fugitive

emission come from quarrying and primary crushing of raw materials, storage and handling of raw materials, fuel, clinker, and finished product, and from vehicle traffic.

Fugitive dust emissions are best controlled by efficient site design and lay-out as well as proper maintenance and operation of equipment to reduce spillage and air leakage from collection systems. These can be addressed appropriately in a dust mitigation plan and operation and maintenance plan. Fugitive dust control and mitigation measures may include open pile wind protection, use of water spray or chemical dust suppressors, paving, road wetting, and housekeeping requirements, and humidification of stockpiles. Additional measures may include enclosing or encapsulating dusty operations such as grinding, screening and mixing, covering conveyors and elevators, vacuum systems to prevent formation of diffuse dust from spillage during maintenance operations, and flexible filling pipes for dispatch and loading processes. Particularly dusty operations may require ventilation and collection by a control device similar to that for stack emissions.

Various systems have been employed in the cement industry to control point source or stack emissions in the past, but the predominant means of add-on particulate control currently in use are either fabric filtration (bag houses), electrostatic precipitation (ESP) or a combination of the two (hybrid filters). Hybrid filters are often ESP systems that have been modified to include a bag house in order to extend the useful life of the control device. In some cases a cyclonic separator may be used to remove larger particulate matter upstream of these fine particulate control devices.

Fabric filters are very efficient at dust collection, with the basic principle of a fabric membrane that allows the gas to pass but retains particulate. The most common large scale systems use hanging bags arranged geometrically across the top of a box or chamber, hence the name "bag house." Dust is deposited both on the surface and within the fabric, and in time the dust itself becomes the dominant filtering medium. Periodic cleaning of the fabric membrane is required as dust builds up and resistance to gas flow increases. The most common cleaning methods are compressed air pulsing, reverse airflow, mechanical shaking or vibration. Usually baghouses have multiple chambers that can be isolated in case of bag failure, and to maintain efficiency during the cleaning cycle. Filter bags are available in a variety of woven and nonwoven fabrics with some synthetic fabrics that can operate effectively at temperatures above 500^{o}F. Monitoring systems such as bag leak detectors can ensure continuous efficient operation of the control equipment and often detect failures in advance of emissions excesses.

TACs Emissions Control

The TACs addressed in the proposed regulation as well as the federal NESHAP come in a variety of forms, so that control thereof is equally varied. The addition of adsorptive materials to the production process can be utilized to adsorb organic compounds, ammonia and ammonium compounds, HCl and mercury. The removal of toxic compounds that are emitted in solid form such as lead, beryllium and chrome is also increased slightly by the use of activated carbon. Acidic compounds can be removed through use of scrubbers which either spray caustic liquid

into the kiln itself or into a separate reaction chamber downstream of the kiln. Alternatively, dry lime can be utilized in place of the caustic solution. Dioxins and furans are controlled by activated carbon or through operational controls such as maintaining a lower inlet temperature to the baghouse or other particulate abatement device.

Adsorption addition refers to adding lime or activated carbon to the cement manufacturing process in either a wet or dry form when raw materials are mixed prior to entering the kiln, or directly incorporated into the clinker formation process. The lime may be calcium oxide (CaO) or any of the various chemical and physical forms of quicklime, hydrated lime, or hydraulic lime. Dry scrubbing is another term for the addition of dry CaO and this has already been implemented to a degree at Lehigh. Two raw mills are situated immediately prior to final mixing of the raw materials and test results show a decrease in emissions when these are operating due to the increased addition of pulverized limestone into the flue gas. A suspension of hydrated lime in water may be sprayed into the cement kiln flue gas to reduce emissions and is called lime slurry injection (LSI). Lehigh obtained a permit from the District in 2010 to add LSI to their process (injection point at the last stage of the preheater/precalciner) and the system has been installed and used on a trial testing basis. The facility is awaiting county approval before beginning full scale operation.

Organic compounds, ammonia and ammonium compounds, HCl, mercury, SO_2, and to a lesser extent, residual dust can be removed by adsorption by activated carbon. As stated above, activated carbon can be injected into the cement manufacturing process (ACI), or alternatively the kiln gases can be routed to packed beds or filters. In both cases, the saturated carbon is then added to the fuel mix in the kiln. Lehigh applied for a permit from the District to install ACI primarily to reduce emissions of mercury. The installation was completed and ACI was fully operational beginning in May 2011.

4.0 Regulatory Proposal

Requirements

The District is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of NOx and PM in concert with efforts to bring the Lehigh facility into compliance with limits for TACs consistent with the federal NESHAP. As an existing facility, Lehigh is not subject to the criteria pollutant emissions standards of the amended NSPS. Significant modifications will be required to reduce TAC emissions, including additional controls such as LSI and ACI, as well as enhanced monitoring requirements. The emission limits proposed in Regulation 9, Rule 13 represent the maximum feasible NOx and PM controls as applied to an existing unmodified source. The equipment modifications necessary to meet the proposed NOx emission limit may result in some excess ammonia emissions. Ammonia is a TAC and a precursor to secondary particulate matter formation; for this reason an ammonia emission limit is included in the proposed rule. Additional requirements of the proposed rule address concerns over the present configuration of the emission point from the kiln, and the need for enforceable fugitive dust control and mitigation measures. The proposed effective date of September 9, 2013 corresponds with that of the 2010 amended NESHAP and NSPS.

Criteria Pollutant Emissions Limits

Pursuant to the authority granted by Health & Safety Code Section 40001 to adopt rules to achieve state and federal ambient air standards, the District proposes the following emission limits for Portland cement manufacturing kilns:

- 2.3 pounds NOx per ton of clinker produced averaged over 30 days
- 0.04 pounds PM per ton of clinker produced averaged over 3 source test runs
- 10 ppmv ammonia above baseline, dry at 7% oxygen averaged over 24 hours.

Where possible, limits and averaging times are expressed so as to maintain consistency with federal standards and represent the most stringent limits that Lehigh can achieve for these pollutants in a cost-effective manner. Staff has evaluated the controls required by the federal standards and has proposed these standards based on reasonably achievable emission rates for this facility. These emission limits will require the use of a continuous emission monitoring system (CEMS) or parametric monitors, as well as a means of monitoring and recording the production rates. CEMS, parametric monitors, and production monitoring requirements are detailed in the monitoring and records section of the rule. There is currently no commercially available CEMS for PM, and since the compliance date for the Federal rules has be delayed until 2015, there is no longer a reasonable expectation that this parametric monitoring equipment will become available by September 9, 2013. District staff has proposed a standard that relies on

source testing to determine compliance for PM. In order to ensure the operational integrity of the PM control equipment, the rule specifies parametric monitoring that may take the form of PM CEMS when they become available, or bag leak detection systems in the interim. Lehigh has already installed a parametric monitor to measure ammonia and is currently calibrating and testing this equipment for quality assurance of the measurements. All CEMS and parametric monitors are required to comply with the provisions of the District Manual of Procedures, federal requirements, and to maintain records as provided in District Regulation 1. An initial demonstration of compliance with these emission limits must be performed within 90 operating days of the effective date of the rule and repeated annually thereafter.

TAC Emissions Limits

Pursuant to the authority granted by Health & Safety Code Section 39659 to regulate TACs, the following emission limits are proposed:

- 0.2 nanograms Dioxins/Furans (TEQ) per standard cubic meter, dry at 7% oxygen averaged over 24 hours

- 55 pounds Mercury per million tons of clinker produced averaged over 30 days

- 3 ppmv HCl, dry at 7% oxygen averaged over 30 days

- 24 ppmv Total Hydrocarbons (THC), dry at 7% oxygen averaged over 30 days, or alternatively, 12 ppmv Total Organic HAP, dry at 7% oxygen averaged over 30 days.

The proposed emissions limits are consistent with the revised 2012 NESHAP standards but with compliance deadlines consistent with that of the previous 2010 NESHAP, September 9, 2013. These proposed standards will provide protection to nearby communities should the federal rules be further delayed or overturned either through legislative efforts or pending litigation. Lehigh has already installed control equipment (LSI and ACI) and monitoring equipment (CEMS and parametric monitors) in order to meet the compliance date of the federal rules.

Opacity Standard and Dust Control

District staff proposes an opacity limit of 10 percent opacity lasting for no more than three minutes in any one hour period from any emission point or miscellaneous operation. Compliance with this standard will be facilitated through the following dust mitigation control measures:

- Mitigation measures to minimize fugitive dust emissions from disturbed soil, open areas and unpaved roads

- Surface stabilization methods for material storage piles and dust suppression methods for material transfer processes, material handling equipment, housekeeping, and material cleanup

- Track-out prevention and control provisions to minimize dust emissions from paved roads

- Vehicle traffic speed limits

- Provisions to minimize emissions from material transfer and blasting at rock quarries

- Personnel training procedures.

These fugitive dust mitigation measures were derived from the Fugitive Dust Control Plan (FDCP) that Lehigh developed in cooperation with the District, as part of Lehigh's recent Title V permit renewal. To provide clarity and improve enforceability, additional definitions and test methods were derived from the California Air Resources Board Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations.

Emission Point Requirements

District staff has proposed that emissions from the kiln be monitored continuously, and enter the atmosphere from a point, or points, that have been demonstrated to not cause an unacceptable health risk to the community surrounding the facility. Lehigh anticipates making several modifications to the facility necessary for compliance with NESHAP provisions. The proposed regulation will require anyone operating a Portland cement manufacturing facility to demonstrate that emissions from the kiln, when combined with other facility emissions and operating at maximum permitted throughput, will not trigger the notification requirements of the Air Toxics "Hot Spots" Information and Assessment Act as codified in California Health and Safety Code Section 44300 et.al.

As part of the Air Toxics Hot Spots (ATHS) program, the District required Lehigh to prepare a comprehensive Health Risk Assessment (HRA) based on recently updated California Office of Environmental Health Hazard Assessment (OEHHA) guidelines. After District staff noted several discrepancies and/or errors and requested revisions to the HRA submitted by Lehigh in September 2010, a revised HRA was submitted in March 2011. The HRA included several emissions scenarios covering operation before and after implementation of the sorbent (lime and activated carbon) injection systems, as well as a projected future 2013 scenario considering additional risk reduction measures necessary to comply with NESHAP requirements (e.g. a modified kiln dust collector with higher single exhaust stack, and more stringent emissions standards for toxic air contaminants) and based on maximum permitted capacity (1.6 million tons of clinker). The HRA indicated that health risk levels associated with operation of the facility are below the significance thresholds which would trigger public notification under provisions of the ATHS program. District staff found the HRA to be completed in accordance

with ATHS program guidelines and OEHHA staff reviewed the HRA document and provided comments, but did not note any significant issues.

After initially proposing a single 300 foot stack for their kiln, Lehigh has requested greater flexibility to accommodate other potential stack locations, configurations, and number of emissions points. Structural constraints, dynamic back pressure on the plume, as well as aesthetics and compliance with local building codes place constraints on the actual height of the stack. The number of emissions points is constrained by the continuous monitoring requirement on all emission points, due to the costs associated with installing and operating monitoring equipment. The proposed regulation is written to accommodate these alternatives while ensuring that the reductions in health risk to the surrounding community is maintained.

Sulfur Dioxide

On June 2, 2010, EPA established a new one-hour SO_2 ambient air quality standard which became effective on August 23, 2010. The new national standard, 0.075 ppmv, is considerably more stringent than the existing California ambient air quality standard, 0.25 ppmv. District staff is examining whether existing sources of SO_2, including Lehigh, have emissions sufficient to result in SO_2 concentrations above the new ambient standard. Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh's SO_2 emissions may result in modeled concentrations above the standard; however, monitoring data for several other facilities indicate that modeling may significantly over-estimate ambient concentrations. This is likely due to the complex terrain surrounding the Lehigh facility, which is not adequately accommodated by the AERMOD model. In such instances, the model greatly over-predicts the likely downwind concentration (between 5 and 10 times the monitored data for complex terrain versus twice the monitored data for flat terrain). District staff is evaluating the potential of other models to more closely correlate with existing monitoring and improve the accuracy of the modeled results. Currently Lehigh is limited by permit condition to SO_2 emissions of 481 pounds per hour.

As mentioned previously, the LSI and ACI systems recently installed at Lehigh will reduce SO_2 emissions and the elevated stack will greatly reduce ground level concentrations of this pollutant. No SO_2 emissions standard is being proposed in this rule at this time; however, should future modeling or monitoring results indicate the need for SO_2 reductions from the facility, an emissions standard will be proposed that ensures that Lehigh does not cause an exceedance of the new standard. The facility is required to operate a CEMS to continuously monitor emissions of SO_2 and provide monthly summary reports as part of its Title V permit. District staff will utilize this data in determining any future SO_2 emissions standard.

5.0 Emissions Reductions

Emissions to the atmosphere from the manufacture of cement primarily come from combustion of fuel to heat the kiln, with additional point source particulate emissions from the kiln, grinding and mixing operations, and fugitive particulate emissions from transport of materials. Choice of fuel can impact combustion emissions, whether it is natural gas, coal, petroleum coke, or tires. Currently no cement kiln in the US is fired by natural gas due to substantially higher cost and availability concerns. For other source categories, natural gas presents a cleaner burning fuel option; however, cement kilns have dramatically higher NOx emissions when fired by natural gas as opposed to coal or petroleum coke. Lehigh currently uses 100% petroleum coke, having switched from a mixture of coal and petroleum coke in 2007. Generally, emissions of concern from cement manufacture are the criteria pollutants (NOx, PM, SO_2, and precursor organic compounds) and toxic air contaminants (TACs) from combustion. TACs include benzene, hydrochloric acid, dioxins and furans, as well as trace metals such as mercury, cadmium, arsenic, nickel, chromium, and manganese. In addition, cement kilns generate large amounts of greenhouse gases, primarily carbon dioxide (CO_2).

Emissions Inventory

Table 3 shows the average daily emissions from the cement kiln at Lehigh according to BAAQMD records for 2010. These values are determined by emission factors assigned by District permit engineers, stack testing, mass balance estimates, and the annual throughput of fuel used and clinker produced as reported by the facility. Lehigh reported that they produced 847 thousand tons of clinker in 2010, a little over half the permitted amount of 1.6 million tons per year.

Table 3 – Lehigh Southwest Cement Company Kiln Emissions (2010)

Pollutant	Average emissions in pounds per day	Average emissions in pounds per ton of clinker
Particulate Matter (PM)	32.62	1.40E-02
Precursor Organics (POC)	59.2	2.55E-02
Oxides of Nitrogen (NOx)	9,290	4.00E+00
Sulfur Dioxide (SO_2)	2,665	1.15E+00
Carbon Monoxide (CO)	5,435	2.34E+00
Benzene	16.1	6.84E-03
Hydrochloric Acid (HCL)	179	7.63E-02
Mercury	0.72	3.05E-04
Total Equivalent CO_2	4.08E+06	1.76E+03*

**NOTE: Total equivalent CO2 value calculated based on 2008 inventory scaled by the ratio of reported clinker produced for 2010 and 2008.*

Emissions Reductions

The proposed rule would limit emissions of NOx to 2.3 pounds per ton of clinker produced. This translates to a reduction in NOx emissions from the kiln of 2 tons per day or a 42% reduction over current levels. Lehigh is subject to the NESHAP emission limits and has already taken steps to meet these limits through application of the LSI and ACI systems detailed in the Technical Review section of this report. Operation of this equipment will have a side-benefit of reducing emissions of SO_2 over previous levels, although it would be difficult to estimate the exact reduction in SO_2 emissions.

Reductions in particulate matter emissions are more difficult to quantify than the NOx reductions. The Lehigh kiln currently emits at a rate comparable to the proposed standard for PM which is consistent with the 2010 NESHAP standard for existing sources. Compliance with the fugitive dust control and mitigation provisions of the rule will also help to ensure the continued minimization of fugitive dust emissions. The proposed limit for NOx will decrease the potential for secondary particulate formation, and the proposed standard for ammonia emissions will limit potential secondary particulate formed by increased ammonia emissions resulting from NOx control.

As part of the 2010 Clean Air Plan, District staff developed a multi-pollutant evaluation method (MPEM) to evaluate the benefits of the proposed control measures contained in the plan. The MPEM can be used to calculate the reductions in PM2.5 from its precursors, NOx, SO_2, and ammonia, based on air quality modeling. The emissions reduction of NOx combined with the proposed ammonia emission standard would be equivalent to a PM2.5 emission reduction of 8.7 tons per year. This number would be slightly increased by the side-benefit reduction in SO_2 emissions mentioned previously.

Emissions from the kiln and the expected reduction resulting from the proposed rule are provided in Table 4:

Table 4 – Lehigh Kiln Emissions and Emissions Reductions from proposed Reg. 9-13

Pollutant	Average emissions in pounds per day (2010)	Average emissions reduction in pounds per day
Oxides of Nitrogen (NOx)	9,290	3,900
Particulate Matter (PM)	32.62	3.3*
Precursor Organics (POC)	59.2	54
Benzene	16.1	14.5
Hydrochloric Acid (HCL)	179	125
Mercury	0.72	0.67

**NOTE: Does not include reductions of secondary PM or fugitive dust from miscellaneous sources.*

6.0 Economic Impacts

Cost of Controls

Lehigh is undergoing major modifications at their facility to meet the federally-imposed NESHAP requirements. Regulation 9, Rule 13 is being proposed at this time to integrate controls to reduce NOx into Lehigh's planning process, as well as provide a backstop in the event that amendments to the NESHAP are delayed or rescinded. Some of the cost impacts are a result of the EPA mandates and some are the result of the District proposal. Costs attributable to federal compliance include capital and operational costs for TAC control and monitoring equipment, as well as costs for maintenance and reporting of that equipment. Costs associated with the proposed District rule include capital and operational costs for NOx control equipment, stack modifications, and possibly operation and maintenance costs for TAC control and monitoring if the NESHAP compliance deadline is delayed two years. EPA evaluated the cost impacts of the final amendments to the NESHAP and NSPS in documents issued at the same time as those final rules. The costs are nationwide estimates, based on 140 existing and 16 new kilns, and actual costs may vary at individual facilities. Lehigh has provided estimates of costs anticipated for modifications necessary to comply with both the NESHAP and the proposed District rule. Staff verified these estimates through comparison to EPA studies and other sources of information on the Portland cement industry.

In order to meet the emission limits and monitoring provisions of the NESHAP, Lehigh will need to install control equipment as well as CEMS or parametric monitors for each emission point from the kiln and clinker cooler. The baghouses at Lehigh are compartmentalized and have multiple emission points, so Lehigh representatives have told District staff they plan to manifold these to reduce the number of individual monitoring points. This will allow consolidation of monitoring equipment that would be required at each emission point, saving the cost of multiple monitors. Capital costs for modifications to the kiln mill dust collector (KMDC) and clinker cooler dust collector are $28.5 million. In addition Lehigh anticipates it will need to modify the clinker withdraw building at a cost of $1 million. Lehigh has installed a hydrated lime injection system (LSI) as well as activated carbon injection (ACI) in order to meet the NESHAP emission limits; these cost $700 thousand and $735 thousand respectively. Continuous monitoring equipment for THC, HCl, mercury, and PM are estimated to cost $1.5 million to install. Total capital expenditure for equipment necessary to comply with the federal NESHAP is then $32.4 million.

There are costs associated with the operation of this equipment including power generation, delivery and handling of the activated carbon and hydrated lime, and operation, maintenance and reporting for monitoring equipment. Some of these costs are dependent on the cement production rate at the facility. ACI operation will cost $1.10 per ton of clinker produced or $1.2 million per year based on average production over the last 10 years of operation ($1.7 million at maximum permitted capacity). LSI operation will cost slightly higher per ton of clinker at $1.26 million per year based on the same 10 year average ($1.8 million at max capacity). Operation,

maintenance and reporting costs for the CEMS are estimated at $360 thousand per year. Total operating costs for compliance with the NESHAP are then $2.84 million per year.

The total annualized costs for compliance with the NESHAP is found by annualizing the capital expenditures and adding them to the yearly operating costs. The equipment costs capitalized over a 20 year period using a levelized cash flow method come to $5.52 million per year. Adding this to the annual operating cost provided in the previous paragraphs yields total annual costs due to compliance with the NESHAP of $8.36 million.

Using the EPA estimates for a similarly sized and configured kiln as exists at Lehigh, NOx control utilizing SNCR would have a capital cost of $2.3 million, and an annual operating cost of $922 thousand. Similar to the adsorbent injection systems for control of TAC's, the SNCR operational costs are dependent on cement production levels. Lehigh has provided an estimated capital cost resulting from the District proposal that is consistent with this estimate. The emissions standard for NOx contained in the NSPS is based on control using SNCR combined with a well-designed preheater/precalciner utilizing staged combustion. The estimated costs of modifying Lehigh's facility to include staged combustion in the preheater/precalciner would be $15-20 million. SCR, while well-established as a means of NOx control for other source categories was not considered by EPA as it is relatively unproven as applied to cement kilns (see the Technical Review section of this report). CEMS measurement of NOx emissions is already required by District permit conditions so monitoring costs are not attributed to the proposed rule.

Lehigh has provided estimates for the cost to construct a 300 foot stack based on the updated HRA 2013 emissions scenario as well as the draft rule proposed at workshop. The final configuration of the emissions stack may change but this estimated capital cost of $2.5 million remains a reasonable estimate of the costs associated with compliance with the emissions point provisions of the proposed rule. Lehigh will have to provide an HRA demonstration of the final configuration, which may entail some costs, but the impetus for the 300 foot stack came from the updated HRA and ATHS notification provisions. Whatever the final configuration of the emissions stack, an updated HRA would be required as part of the ATHS program.

The total annualized costs for compliance with the proposed District rule may be found by annualizing the capital expenditures and adding them to the yearly operating costs. The SNCR equipment costs capitalized over a 20 year period using a levelized cash flow method come to $392 thousand per year. The cost for the modified emissions point capitalized over 20 years by the same method comes to $426 thousand per year. Adding this to the annual operating cost for the SNCR provided above yields total annual costs due to compliance with the proposed rule of $1.74 million.

Costs for implementation of the Fugitive Dust Control Measures are considered to be minimal. These provisions are already in place as a condition of Lehigh's Title V permit. The inclusion of these measures as requirements of the proposed rule is meant to codify the FDCP and improve enforceability of the provisions contained therein.

Cost Effectiveness

The cost effectiveness of a rule is the sum of compliance costs divided by the expected emissions reduction. This analysis will be limited to NOx, since the TAC emissions reductions comprise several compounds of varying toxicity, and the costs are attributable to compliance with requirements of the federal NESHAP. The costs for modification of the emissions stack are included as these may largely be attributable to the proposed regulation, although, as previously mentioned, manifolding of stacks allows Lehigh to consolidate monitoring equipment that would be required at each emission point, saving the cost of multiple monitors. Total annualized costs for compliance with the rule amounts to $1.74 million. The average NOx emissions rate prior to implementation of controls was 4.0 pounds per ton of clinker produced, and the proposed emissions standard is 2.3 pounds per ton of clinker produced. Taking the difference and assuming the same 10 year average of production levels as for the cost analysis above, yields a cost effectiveness (C.E.) of:

C.E. = $1.74 million / {(4.0-2.3) * (pounds NOx/ton clinker) * (70%) * (1.6 million tons clinker)}.

Or:

C.E. = $0.91 / {pounds NOx reduced * (1 ton / 2,000 pounds)} = $1,828 per ton NOx reduced.

$1,828 per ton NOx reduced is among the most cost effective NOx rules considered by the District.

Incremental Cost Analysis

Section 40920.6 of the California Health and Safety Code requires an air district to perform an incremental cost analysis for any proposed Best Available Retrofit Control Technology rule or feasible measure. The air district must: (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the air district must "calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option."

To evaluate the incremental cost effectiveness of compliance with a more stringent option, staff compared the NOx standard of the proposed rule (2.3 lbs NOx/ ton of clinker produced) with the NSPS standard (1.5 lbs NOx/ton of clinker produced). Compliance with the NSPS NOx standard would require redesign and construction of the preheater/precalciner. These costs were provided in the preceding Cost of Controls section ($15-20 million). The annualized capital costs using the same 20 year levelized cash flow method would come to $3.4 million (using the high estimate for reconstruction). Using this increment of increased compliance costs for the rule and inserting the difference between the proposed standard and that of the NSPS into the cost effectiveness equation above yields and incremental cost effectiveness (I.C.E) of:

I.C.E. = $3.4 million / {(2.3-1.5) * (pounds NOx/ton clinker) * (70%) * (1.6 million tons clinker)}.

Or:

I.C.E. = $3.8 / {pounds NOx reduced * (1 ton / 2,000 pounds)} = $7,573 per ton NOx reduced.

Meeting the more stringent NSPS emissions level would come at a cost of more than four times the cost of meeting the proposed standard in terms of dollars per ton of additional NOx reduced.

The proposed rule appears to be extremely cost effective, as District rules to reduce NOx typically range between 7 to 20 thousand dollars per ton of NOx reduced; however, the socioeconomic analysis shows that the cost of District and NESHAP controls is a significant economic impact.

Socioeconomic Analysis

Section 40728.5 of the California Health and Safety Code requires an air district to assess the socioeconomic impacts of the adoption, amendment or repeal of a rule if the rule is one that "will significantly affect air quality or emissions limitations." BAE Urban Economics of Emeryville, California has prepared a socioeconomic analysis of the proposed rule and it is attached to this report as Appendix C.* The analysis concludes that the proposed regulation would have a significant economic impact to the affected industry. BAE Urban Economics found an average profit margin for the Portland cement manufacturing sector of 6.5% of total revenue. The annual profit for Lehigh was estimated to be $6.6 million. Compliance with the rule would result in an 18% reduction in established profit, which is above the California ARB 10% threshold used to determine cost burden.

The cost burden for compliance with emissions standards in the federal rules is even higher. If the District were to impose the NSPS limit of 1.5 pounds NOx per ton of clinker, compliance would result in a 30% reduction in profit. As this is three times the ARB threshold, it is easier to see the infeasibility of such a requirement even given the seemingly low incremental cost-effectiveness of this more stringent standard. Compliance with the requirements of the NESHAP already imposes compliance costs representing 43% of Lehigh's annual profit.

The Portland cement manufacturing industry may be able to pass these compliance costs on to consumers. An industry's ability to pass through costs is more likely when a product is demand-

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** NOTE: The Socioeconomic Analysis conducted by BAE Urban Economics uses a straight line depreciation method for calculating costs. This divides total costs by time period considered. Capital costs are annualized over 20 years. For the purposes of calculating cost effectiveness and incremental cost effectiveness, staff used the levelized cash-flow method typical of District regulatory economic analyses. The levelized cash flow method incorporates an interest rate into the capital recovery factor for annualized costs, in this case 5%.*

inelastic, but in the case of this industry that ability is somewhat unknown. The United States imports about 20% of cement to meet construction needs, so the impact on one facility, or the nation's facilities in the case of the NESHAP, may not be able to be passed through to customers without increasing imports. For Lehigh to reduce the costs of compliance with the proposed District rule to the 10% threshold, the cost of cement would have to increase by 0.72% or 72 cents per ton. The NESHAP costs are 43% of Lehigh's annual profit, and to pass these costs onto consumers, the price of cement would need to increase by $3.18 per ton (3.18%). Combining the costs of compliance with the proposed rule and the NESHAP, Lehigh would need to increase the cost of cement by $4.48 per ton to completely offset the costs of both rules, and by $3.53 to reduce the cost impact to the 10% threshold.

As part of the analysis of their amendments to the NESHAP, EPA examined the economic impacts in the report, "Regulatory Impact Analysis: Amendments to the National Emissions Standards for Hazardous Air Pollutants and New Source Performance Standards (NSPS) for the Portland Cement Manufacturing Industry, Final Report" issued August 2010. EPA estimated that compliance with the NESHAP standards could raise the price of cement $4.50 to $5.00 per ton (2005 prices). They further estimated that cement imports could rise by 10% to offset reduction in domestic production and price increases.

On June 22, 2012, EPA proposed revisions to the NESHAP as a response to a settlement agreement signed by EPA and the cement manufacturing industry. Among the proposed revisions was that of the effective date from September 9, 2013 to September 10, 2015. As a result, if the federal proposal is finalized without change, the proposed District rule would result in two years costs of compliance and monitoring of the TACs addressed in the NESHAP. After which, all Portland cement facilities in the US would be subject to the same standards.

7.0 Environmental Impacts

California Environmental Quality Act

Pursuant to the California Environmental Quality Act, the District has had an initial study for the proposed rule prepared by Environmental Audit, Inc. of Placentia, California. The initial study concludes that there are no potential significant adverse environmental impacts associated with the proposed rule. A negative declaration is proposed for approval by the District Board of Directors. A copy of the negative declaration and initial study is attached to this report as Appendix D and was made available for public comment. No comments on the CEQA document have been received.

Greenhouse Gas Emissions

In June, 2005, the District's Board of Directors adopted a resolution recognizing the link between global climate change and localized air pollution impacts. Climate change, or global warming, is the process whereby emissions of anthropogenic pollutants, together with other naturally-occurring gases, absorb infrared radiation in the atmosphere, leading to increases in the overall average global temperature.

While carbon dioxide (CO2) is the largest contributor to global climate change, methane, halogenated carbon compounds, nitrous oxide, and other species also contribute to climate change. Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. Direct effects occur when the gas itself is a greenhouse gas (GHG). While there is relative agreement on how to account for these direct effects of GHG emissions, accounting for indirect effects is more problematic. Indirect effects occur when chemical transformations of the original compound produce other GHGs, when a gas influences the atmospheric lifetimes of methane, and/or when a gas affects atmospheric processes that alter the radiative balance of the earth (e.g., affect cloud formation).

Adoption of Regulation 9, Rule 13 will not result in any adverse impact on the emissions of GHGs. The regulation includes an emissions standard for total hydrocarbons that may result in a reduction of methane emissions, although consistent with the NESHAP, the rule contains an alternative standard for total Organic HAP emissions which would exclude methane emissions. Operation of the controls necessary to meet the other emissions standards may result in a minimal increase in energy demand, but is unlikely to increase emissions of GHGs from the kiln itself.

8.0 Regulatory Impacts

Section 40727.2 of the Health and Safety Code requires an air district, in adopting, amending, or repealing an air district regulation, to identify existing federal and district air pollution control requirements for the equipment or source type affected by the proposed change in air district rules. The air district must then note any difference between these existing requirements and the requirements imposed by the proposed change.

As stated in the Background section of this report, there are two federal rules which govern air emissions from the manufacture of Portland cement. The NSPS provides emissions standards for NOx, SO2, and PM from new or modified Portland cement kilns and the NESHAP provides emissions standards for TACs from all Portland cement kilns with one set of standards for existing kilns, and one for new or modified kilns. The kiln at Lehigh has not undergone sufficient modification to be deemed new or modified after the effective dates of either rule, so is subject to only the existing source emissions standards contained in the NESHAP. All of these standards for TACs are included in the District's proposed rule. The proposed rule has an effective date of September 9, 2013 which is consistent with the 2010 version of the NESHAP, but this date has been proposed to be delayed two years pending EPA's final decision due in December of 2012. In addition, the proposed federal PM standard has been raised to 0.07 pounds per ton of clinker. The District's proposed 0.04 pounds per ton of clinker standard for PM would be more stringent. The proposed rule contains a NOx standard that is less stringent than that contained in the NSPS, but since the Lehigh facility is not new or modified, this proposed standard is in effect more stringent than what is required by federal rules. Additionally, the proposed rule contains an emissions standard for ammonia, dust mitigation measures, and a HRA demonstration for emissions points. These are not addressed in the federal rules, so these elements may be considered more stringent than federal requirements.

There are currently no State rules that specifically regulate cement manufacture, other than greenhouse gas emissions cap and trade (AB 32), and those rules governing the use of scrap tires as fuel. Several air districts (Antelope Valley, Amador, Kern, Mojave, and Monterey Bay Unified) with cement kilns operating within their jurisdiction have adopted regulations to address emissions of NOx and/or PM from these sources. South Coast Air Quality Management District has adopted several cement manufacturing regulations addressing emissions of NOx, PM, CO, as well as hexavalent chromium and fugitive dust. At least two of these regulations were adopted to address specific conditions at individual cement manufacturing facilities. These regulations are different in format, and include provisions tailored to the facilities in their jurisdiction. Staff believes that the proposed rule is no less stringent than any of the regulations governing cement manufacture from other air district in California, and is more stringent in terms of actual emissions standards for NOx, and TACs.

9.0 Rule Development Process

The District has developed rule language and provided a basis for its provisions in this staff report. The proposal is based in part on proposed federal regulations and in consideration of existing regulations in other air districts in California, as well as those of other jurisdictions in the United States and Europe. Elements of the proposed rule have been tailored to meet considerations specific to the Lehigh facility. Staff has consulted with officials from Lehigh Southwest Cement Company, Portland cement industry experts, elected local government officials, concerned members of the public and environmental organizations, California Air Resources Board staff, and EPA staff during the preparation of this document.

A public workshop was held December 12, 2011 in the City of Cupertino to provide pertinent background information and present elements of the draft rule provisions. Rule Development staff was supported by staff from Compliance & Enforcement, Communications & Outreach, and Technical Divisions, with exhibits on air monitoring and health risk assessment efforts in the local community. The workshop was attended by members of the public, Cupertino City Councilmembers, staff from Lehigh Southwest Cement Company, representatives of local environmental organizations, and the local press. Verbal comments and questions were addressed at the meeting, and the District received several written comments and continued to accept comments well after the initial comment period ending date. Written comments were provided by members of the public, Bay Area for Clean Environment, Citizens Against Pollution, QuarryNo, San Francisco Baykeeper, the Loma Prieta Chapter of the Sierra Club, West Valley Citizens Air Watch, and Lehigh Hansen, Inc., the parent company of Lehigh Southwest Cement Company, LLC. Issues raised are identified and staff's proposed resolutions are provided below.

On May 21, 2012, the Board of Directors conducted an informational meeting at the Quinlan Community Center in Cupertino, CA followed by a visit to the periphery of the Lehigh facility. Written comments were submitted at the meeting and shortly thereafter by the Loma Prieta Chapter of the Sierra Club, and individual members of the public. Additionally in the months following the public workshop, letters from three Santa Clara County cities (Cupertino, Los Altos Hills, and Los Altos) were submitted encouraging the District to adopt stringent standards. Jack Broadbent, Executive Officer of the District responded directly to these letters. Appendix A contains copies of the letters from the Bay Area cities, responses from Jack Broadbent, and comments received at the May 21 meeting and staff responses.

On July 20, 2012, the final proposed rule, a staff report, California Environmental Quality Act analysis and draft negative declaration, and a socioeconomic analysis were published for comment. The comments received and staff responses are included as Appendix B of this report.

Proposed Standards versus Federal Standards

Several comments requested that emissions standards in the rule be as stringent as those applied to "new or modified" sources under the NSPS and NESHAP regulations. Some proposed that

Lehigh should be considered a "new or modified" facility due to facility modifications dating back decades (but after the initial promulgation of the NSPS in 1971), more recent changes in fuel use and emissions control methods installed in anticipation of the proposed NESHAP, or due to modifications of their Title V permit. Others suggested that Lehigh be subject to "new or modified" standards due to its proximity to a large, urbanized population. Additionally, some commenters requested inclusion of an SO_2 emissions standard in the rule. Lehigh requested that the proposed rule mirror the EPA's final NESHAP rule, as they contended that any differences between the District and federal rules would pose a competitive disadvantage to the Lehigh Southwest Cement Company as compared with facilities operating outside of the District.

Since their initial adoption, the NSPS (1971) and NESHAP (1999) have undergone several amendments with standards generally becoming more stringent at each revision. Dates are provided with each amendment to indicate the applicable sets of standards for facilities modified or commencing operation before or after said date. The pertinent dates for the most recent amendments to the federal rules are June 16th, 2008 for the NSPS, and May 6th, 2009 for the NESHAP. In the code of federal regulations (40 C.F.R. Section 60.14(a)), "Modification" is defined as "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies…Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere." The code goes on to exclude from consideration routine maintenance, repair, and replacement. Also excluded are increases in production rate or emissions increases that do not involve a capital expenditure in excess of 50% of the fixed capital costs required to construct an entirely new comparable facility. Furthermore, modifications to permit conditions that do not result in an increase in emissions do not trigger new or modified standards. Neither do modifications undertaken to bring a facility into compliance with newly adopted regulations.

The District does not have information establishing that Lehigh has undertaken any changes in operation or equipment after the effective dates that could be deemed as "modifications" per the definitions contained in the appropriate sections of the code of federal regulations. The standards contained in the proposed District regulation represent reasonably achievable cost-effective emission standards for the facility, and in fact represent more stringent standards than the applicable federal rules since as an existing facility Lehigh is not subject to the amended NSPS or NESHAP standards for "new or modified" facilities. Some commenters suggested that these federal standards have been proven to be feasible and cost effective by the EPA for all cement manufacturing facilities. However, if this were the case, the more stringent standards would be applied all kilns, including those at existing facilities, rather than only for those at "new or modified" facilities.

As stated earlier in this report, the issue of attainment of the recently revised national one-hour ambient air quality standard for SO_2 is currently in flux and as yet undetermined. District air quality monitoring data show SO_2 levels well below the standard. It is not expected at this time that SO_2 emissions reductions at Lehigh will be required to attain the ambient SO_2 standard. Should the District determine a need for SO_2 reductions from the facility in the future, staff may

propose that the rule be amended to include a standard that ensures emissions from the Lehigh facility do not cause an exceedance of the new one-hour ambient air quality standard for SO_2.

The District has authority under California law to adopt emission limits more stringent than those required under federal regulations; however, any emission standard adopted by the District must be evaluated for cost-effectiveness and socio-economic impact. These analyses are part of this report, and staff believes that the proposed rule balances costs with necessary emissions reductions. The proposed regulation contains emissions standards that are as stringent as or more stringent than the applicable standards contained in the federal rules.

Emissions Monitoring

Several members of the public expressed concerns over emissions monitoring equipment, methodology, and averaging methods, with some commenters requesting that emissions monitoring data be made more readily available to the public. Some suggested that emissions be posted on the internet in real time similar to that provided by weather monitoring stations (and District ambient air measurements) and others felt that the community at large could provide a resource to analyze the raw data on the District's behalf. Some commenters questioned the use of rolling averages, the distinctions between parametric monitors and continuous emissions monitors, and whether all 32 stacks of the existing kiln dust collection system would be monitored.

The District is committed to accurate measurement of emissions from all regulated sources and to providing emissions monitoring data to the public to the extent feasible. Obtaining CEMS data from an active cement kiln is far more complex than ambient monitoring, and measurements need to be verified for accuracy before they can be made available to the public. Furthermore, emissions standards are tied to the production rate, and averaged over a 30 day period, so providing emissions data at or near real time would do little to enable the public to determine compliance of the facility. Nevertheless, CEMS data reported to the District is currently available for public review, through Public Records Requests by calling (415) 749-4761, or by visiting: http://www.baaqmd.gov/Divisions/Legal/Public-Records-Request.aspx. The District is working on developing increased accessibility to CEMS data by posting these reports on-line for major facilities, but believes a District-wide approach to this effort to be more appropriate than one specific to a single facility. The District currently provides real time on-line access to data from its ambient air monitoring network including the station located in Monta Vista Park in Cupertino, one mile east of the Lehigh Facility (see: http://gate1.baaqmd.gov/aqmet/aq.aspx). Unlike CEMS data, air monitoring data is a direct measurement of the quality of air typical of what the surrounding population breathes every day. Staff believes that this data is far more useful in making judgments about the health effects of the air in the Cupertino area.

The proposed regulation is worded to ensure consistency with federal standards where appropriate. Rolling averages are commonly used with data measured at uniform time intervals to smooth out short-term fluctuations and highlight longer-term trends or cycles. A longer averaging period allows for the standard to be a lower number as compared to a shorter

compliance interval and 30-days was chosen by EPA to allow for variations in Portland cement production cycles.

District Manual of Procedures Volume V (Continuous Emission Monitoring Policy and Procedures) addresses the requirements which must be met by CEMS installations for those persons subject to District Regulations. Volume V currently only addresses measurement of opacity, sulfur dioxide, nitrogen dioxide, oxygen, and carbon dioxide. For this reason, the proposed regulation differs from federal regulations in calling for "parametric monitoring" for continuous monitoring of ammonia, mercury, total hydrocarbons, and hydrochloric acid. Federal test methods and performance specifications are cited for these pollutants rather than District test methods, and in all intents, the parametric monitoring shall consist of a CEMS. The CEMS equipment for these latter pollutants has only recently become available, at least in their application to cement manufacture, and in the case of PM, is not yet commercially available. As the use of this equipment becomes more commonplace, the District may consider amendments to the Manual of Procedures for their inclusion in Volume V.

The proposed regulation requires emissions monitoring of each emission point from the kiln and clinker cooler. Lehigh has indicated that they will be modifying their dust control system to duct all the 32 stacks to either a single elevated stack, or possibly several stacks (though far less than 32). The multiple stacks from the clinker cooler are also expected to be combined together to eliminate the need for multiple banks of CEMS. Nevertheless, the regulation is worded so that continuous emissions monitoring is required on each emissions point regardless of the number. This presents a strong economic incentive to minimize the number of emission points due to the expense of duplicative emissions monitoring equipment.

Mercury Emissions

Of all the pollutants emitted from the kiln, mercury is of particular concern for many community members surrounding the Lehigh facility, along with local environmental organizations concerned with water quality. Comments pertaining to mercury emissions included requests for an annual cap rather than an emissions standard tied to production levels, and questions regarding the potential for increased mercury levels in nearby waterways, as well as increased mercury content in finished cement resulting from operations of the Kiln Mill Dust Collector (KMDC) recycling and ACI systems. Additionally, one commenter was concerned that increased mercury levels in finished cement could impact do-it-yourself consumers, and another commenter suggested that it could result in elevated mercury emissions from concrete recycling efforts at nearby Stevens Creek Quarry.

The health impacts from emissions of mercury from Lehigh have been addressed in a recently updated Health Risk Assessment. Lehigh's Title V air permit already contains limits on annual and hourly emissions of mercury for compliance with the Air Toxics Hot Spots Program. The emissions standards in the proposed rule are consistent with the federal NESHAP and ensure efficient operation because emissions levels are tied to the production rate. Compliance with this standard ensures that mercury emissions would be lower than the Title V cap should production

be lower than the maximum permitted operating limit. Mercury contamination in San Francisco Bay and other water ways is being addressed by the California Regional Water Quality Control Board and is beyond the scope of this rule making effort.

Regarding the potential for increased mercury levels in finished concrete, EPA has authorized KMDC dust shuttle systems at several facilities as a method to reduce mercury emissions and meet pending NESHAP standards. The levels of mercury in the finished cement will be very low, and unlikely to cause a noticeable effect at concrete recycling facilities. Lehigh is responsible for complying with all relevant product warning requirements for the finished product.

Dispersion Modeling

Some commenters questioned the veracity of the updated HRA, given that the workshop report stated that for the purposes of determining compliance with the federal one-hour SO_2 standard, the AERMOD model does not adequately accommodate the complex terrain surrounding the Lehigh Facility. Others questioned the HRA in more general terms based on the emissions inventory, risk factors assigned to various compounds, and possible synergistic interactions for the various toxic compounds.

AERMOD is the most validated model that EPA has ever approved for use (17 field study validations); however, for short term concentrations, the model always over-predicts the measured concentration at a monitor. For flat terrain, this is usually within a factor of 2 and for complex terrain it can be 5 to 10 times higher than monitored values. The application of AERMOD to model 1-hour SO_2 concentrations is very different from using it to assess the health impacts due to a lifetime exposure. Modeling short term impacts such as the 1-hour SO_2 concentration is inherently difficult because of short term turbulent nature of the atmosphere. Comparisons to actual monitoring data are almost always better for long term averages. For an HRA, any over-prediction of actual concentrations actually serves to be health protective, since the calculated health risk is proportional to the modeled concentrations. That is why health risks are always reported as an upper bound on health impact such “no more than 1 case in a million.”

The District believes that the ATHS program is a health protective risk management program. The HRA is required to be completed in accordance with OEHHA guidelines and these consider the effects of different compounds additively but not synergistically. For more information regarding the District’s position on synergistic toxicity, please see the March 29, 2011 letter from Jack Broadbent to Supervisor Liz Kniss found in Appendix E at the end of this report.

Alternative Fuels

The use of natural gas to fire the cement kiln was suggested as a means of lowering emissions by some commenters, while others expressed their desire to be notified should Lehigh seek to fire the kiln by fuels other than those currently in use according to their permit. Some commenters

drew comparisons to natural gas fired power plants in California that have reduced emissions as compared to coal fired power plants in the Eastern United States.

As applied to power generation, natural gas does result in more efficient burning and less greenhouse gas emissions; however it results in significantly higher NOx emissions when used to fire cement kilns. SCR is a proven technology for controlling NOx emissions from power generation, but is relatively unproven for cement manufacturing due to the dust entrained in the flue gasses. In order to adequately control the increased NOx emissions, Lehigh would need to use more ammonia in their SNCR system, and this would likely result in greater ammonia emissions which would offset any gains in reducing secondary particulate emissions. Natural gas is also generally much more expensive than either coal or petroleum coke (approximately 10 times the cost per BTU), the costs are much more variable, and delivery in the amounts necessary to fire the kiln would pose economic and logistical burdens inconsistent with any possible emissions reduction likely to be gained from its use. Should Lehigh seek to utilize a new fuel other than what is currently allowed by permit, it would require modification of their Title V operating permit, and this would entail the notification and comment provisions of that program.

Opacity Standard

Some commenters raised objections to the use of a Ringlemann smoke chart for determining opacity readings as insufficient, and others suggested utilizing a “high quality monitor” in place and use comparisons to the Ringlemann chart as an adjunct.

The opacity standard to be met by miscellaneous sources at the facility are stated in both Ringelmann number (for dark plumes) and percent opacity (for white plumes), but these are meant to indicate a set standard to be met, rather than the means of measurement. District staff is trained and certified to read opacity using the Ringelmann chart, and these readings are more appropriate for the many sources, such as mining operations, conveyor belts, and roads that do not lend themselves to in-stack monitors. All emission points from the kiln and clinker cooler are required by the proposed rule to be measured by periodic source testing. This is consistent with Federal rules that exempt kilns and clinker coolers from opacity standards since particulate matter is more accurately monitored by direct measurement. Both the kiln and clinker cooler are still subject to a 20% opacity limit as per District Regulation 6, Rule 1.

Compliance Dates and Penalties

Some commenters were concerned that the source testing provisions of the proposed rule allow for up to 30 operating days before an initial demonstration of compliance must be performed. Other commenters asked for interim deadlines for the installation of specific control equipment as a means of ensuring progress toward meeting the standards. Several others requested that the rule contain punitive measures for noncompliance along with other provisions of the proposed rule.

Compliance with the emissions standards begins on the effective date specified in the rule. This will be predominately determined by emissions monitors that measure emissions continuously. The source testing requirement is a duplicative verification of compliance. In either case, if the results show noncompliance with the standards, the violation begins on the date of effectiveness, not one month after. The standards are stated as a monthly average to be consistent with federal rules, so compliance with the standard cannot be made until 30 days have elapsed. EPA staff has indicated that this is consistent with their views regarding initial determination of compliance.

District staff believes that interim deadlines are unnecessary, and compliance with the standards on the effective date is required regardless of the means of control to meet those standards. The control equipment for toxic emissions has already been installed. Modifications to the stack, and installation of NOx control equipment has not yet begun, but Lehigh must comply with the proposed rule on the effective date or be subject to enforcement action. Noncompliance with any District rule is subject to enforcement procedures that may include punitive measures. There is no need to add provisions to the proposed rule for additional punitive measures. It is the view of District staff that adoption of this rule furthers enforcement powers.

Workshop Comment Process

Some commenters expressed concerns regarding the comment process itself with calls for an extension of the comment period deadline, and requests for point by point responses posted on-line. The timing of the workshop in early December may have contributed to these concerns, as some pointed to the holidays as a basis for requests to extend the comment period. Some commenters may have been frustrated due to the extended review period for comments related to Lehigh's Title V permit renewal.

The District has continued to accept comments well after the stated January 3, 2012 comment period deadline, and made this known to all parties requesting extensions. All comments have been considered and responses are provided in this document. Responses to Title V comments were posted on the District website February 16, 2012, along with all other documents provided to EPA for their review.

Miscellaneous Comments

The district received several comments related to issues beyond the scope of this rule making effort. Several commenters brought up the Spare the Air program; either requesting that the facility shut down on Spare the Air days or proposing that emissions from Lehigh were the cause of the increased number Spare the Air days of this last winter. Some commenters requested that truck traffic to and from the facility be included in the measures considered in the proposed rule. Additionally some requested an analysis of the use of urea versus aqueous ammonia for use in the NOx control system.

Cement manufacturing is not a process that can be run intermittently. The kiln in which reactions take place is 16 feet in diameter and 250 feet long, and it must be heated to temperatures in excess of 2,500 degrees Fahrenheit. Shutting down the kiln can take up to 24 hours, and start-up can take up to 36 hours to bring the kiln to operating temperatures. District Regulation 4, Air Pollution Episode Plans does require major facilities to prepare plans to curtail operations during advisories, alerts, warnings and emergencies as defined by the regulation; however, the air pollution concentrations at which a facility must follow its curtailment plan are much higher than those generally found in the District even on Spare the Air days.

The Spare the Air program was established by the District to educate people about air pollution and to encourage them to change their behavior to improve air quality. This voluntary outreach campaign has been operated for nearly two decades with alerts in summer when ground-level ozone or "smog" becomes a pollution problem and in winter when particulate matter concentrations are expected to be unhealthy. District meteorologists evaluate the air pollution levels and meteorological conditions in order to forecast which days may have unhealthy air quality. Winter Spare the Air alerts are generally called on cold still winter days with stagnant air. With the passage of the District's Wood Smoke rule (Regulation 6, Rule 3) in 2008, Winter Spare the Air includes a mandatory curtailment of wood burning on days forecast to exceed the 24-hour National Ambient Air Quality Standard for $PM_{2.5}$. At this time, the Spare the Air program provides a means of curtailing sources of particulate emissions that are otherwise not regulated or controlled through District permitting of prohibitory regulations.

Emissions from trucks do not fall within the category of stationary sources and are therefore outside the authority of the District. The California Air Resources Board regulates truck emissions. Truck traffic to and from the facility is beyond the scope of this regulation, but the fugitive dust control measures included in the proposed regulation will help control dust emissions from trucks through on-site speed limits, truck washing, and other track-out minimization provisions.

The proposed regulation provides emissions standards but does not specify the control equipment to meet those standards; however the proposed standards do include a limit on ammonia emissions to ensure that NOx control equipment does not result excess secondary particulate formations. Aqueous ammonia is a preferred agent for NOx reduction because urea is hazardous to transport and store. This is addressed in the CEQA analysis.

10.0 Conclusion

Pursuant to Section 40727 of the California Health and Safety Code, the proposed rule amendments must meet findings of necessity, authority, clarity, consistency, non-duplication, and reference before the Board of Directors adopt, amend, or repeal a rule. The proposed Rule is:

- Necessary to protect public health by ensuring reduction in toxic air contaminants to nearby residents and by reducing ozone and PM precursors to meet the commitment of Control Measure SSM-9 of the Bay Area 2010 Clean Air Plan;

- Authorized by California Health and Safety Code Sections 40000, 40001, 40702, and 40725 through 40728;

- Clear, in that the rule specifically delineates the affected industry, compliance options, and administrative requirements for industry subject to this rule, so that its meaning can be easily understood by the persons directly affected by it;

- Consistent with other California air district rules, and not in conflict with state or federal law;

- Non-duplicative of other statutes, rules, or regulations; and,

- Implementing, interpreting and making specific and the provisions of the California Health and Safety sections 40000 and 40702.

A socioeconomic analysis prepared by Bay Area Economics has found that the proposed regulation could have a significant economic impact or cause regional job loss; however, staff believes that the costs are necessary to protect public health and make progress towards attainment of air quality standards and that the proposed rule is cost effective. A California Environmental Quality Act (CEQA) analysis prepared by Environmental Audit, Inc., concludes that the proposed amendments would not result in adverse environmental impacts. District staff have reviewed and accepted this analysis as well. The CEQA document was made available for public comments prior to the public hearing, and no comments were received.

The proposed Rule has met all legal noticing requirements, has been discussed with the regulated community and other interested parties, and reflects the input and comments of many affected and interested parties. District staff recommends adoption of proposed Regulation 9, Rule 13: *Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing*; and adoption of the CEQA Negative Declaration.

11.0 References

1. Bay Area Air Quality Management District; *Bay Area 2010 Clean Air Plan, "SSM 9 – Cement Kilns"*, Volume 2, September 15, 2010.

2. Portland Cement Association; *Overview of the Cement Industry, Economics of the U.S Cement Industry,* December 2009; www.cement.org

3. National Association of Clean Air Agencies, Andrew Ginsburg, and Ursula Kramer Co-Presidents of Board of Directors; *NACAA comment on Portland Cement NSPS and attachments;* September 30, 2008.

4. Pete Grannis, Commissioner of the New York State Department of Environmental Conservation, *"Grannis Hails Clean Air Settlement with Cement Manufacturer", Environmnet DEC Newsletter*; February 2010.

5. BAAQMD Emission Inventory, base year 2009.

6. Lehigh Southwest Cement, Permanente Plant; www.lehighpermanente.com

7. US EPA; *National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants*; Federal Register / Vol. 75, No. 174 / September 9, 2010.

8. US EPA; *FACT SHEET for Final Amendments to National Air Toxics Emission Standards and New Source Performance Standards for Portland Cement Manufacturing*; August 9, 2010.

9. Keith Barnett, US EPA; *Final Portland Cement MACT and NSPS Standards Webinar*; November 17, 2010.

10. Consultation with Mr. Henrik Wesseling, Plant Manager of Lehigh Southwest Cement Company; July 2010.

11. Zephyr Environmental Corporation; *Summary of Control Techniques for Nitrogen Oxide,* SN3049, Portland Cement Association; 2008.

12. US EPA, Office of Air Quality Planning and Standards; *Alternative Control Techniques Document Update - NO_x Emissions from New Cement Kilns,* EPA-453/R-07-006; November 2007.

13. European Commission Joint Research Centre, Institute for Prospective Technological Studies, Integrated Pollution Prevention and Control, *Draft Reference Document on Best Available Techniques in the Cement, Lime and Magnesium Oxide Manufacturing Industries*; May 2009; http://eippcb.jrc.ec.europa.eu.

14. Al Armendariz, Ph. D; *The Costs and Benefits of Selective Catalytic Reduction on Cement Kilns for Multi-Pollutant Control*; Department of Environmental and Civil Engineering, Southern Methodist University; February 11, 2008.

15. US EPA; *United States Announces Two Major Clean Air Act New Source Review Settlements at 28 Industrial Plants Nationwide*; January 21, 2010

16. US EPA; *Summary of Environmental and Cost Impacts of Final Amendments to Portland Cement NESHAP (40 CFR Part 63, Subpart LLL)*; Docket Number EPA-HQ-OAR-2002-0051; August 6, 2010.

17. US EPA; *Summary of Environmental and Cost Impacts of Final Revisions to Portland Cement New Source Performance Standards (40 CFR PART 60, subpart F);* Docket Number EPA-HQ-OAR-2007-0877; August 6, 2010.

18. US EPA, Office of Air Quality Planning and Standards; *Regulatory Impact Analysis: Amendments to the National Emissions Standards for Hazardous Air Pollutants and New Source Performance Standards (NSPS) for the Portland Cement Manufacturing Industry Final Report*; August 2010

19. Consultation with Mr. Henrik Wesseling and Mr. Scott Renfrew of Lehigh Southwest Cement Company, Mr. Timothy Matz of Lehigh Hanson, and Mr. Shane Alesi of Heidelberg Cement Group; October 12, 2010.

20. Bay Area Air Quality Management District; *Multi-Pollutant Evaluation Method Technical Document*, April 2010.

21. Bay Area Air Quality Management District; *BACT/TBACT Handbook*, 2002.

22. US EPA; *National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants; 40 CFR Parts 60 and 63*[EPA-HQ-OAR-2011-0817; FRL-9629-9] RIN 2060-AQ93; June 25, 2012.

23. US EPA; *Proposed Amendments to Air Toxics Standards and New Source Performance Standards for Portland Cement Manufacturing FACT SHEET;* June 25, 2012.

24. US EPA, Office of Air Quality Planning and Standards; *Fabric Filter Bag Leak Detection Guidance*, EPA-454/R-98-015;September 1997

APPENDIX A

LETTERS FROM CITIES AND WRITTEN COMMENTS RECEIVED AT MAY 21 BOARD OF DIRECTORS' SPECIAL MEETING AND RESPONSES

Appendix A – Letters from Cities and Written Comments Received at May 21 Board of Directors' Special Meeting and Responses

In the months following the December 12, 2011 public workshop, letters from three cities in Santa Clara County were sent to Jack Broadbent, and he responded directly to each. On May 21, 2012, the Board of Directors conducted an informational meeting at the Quinlan Community Center in Cupertino, CA followed by a visit to the periphery of the Lehigh facility. Written comments were submitted at the meeting and shortly thereafter by three individuals and one organization. A summary of the comments and staff responses is provided below. Following the summary are copies of all written comments received, and direct responses sent.

Cupertino City Council in a letter dated 7 February 2012:

Comment/questions:

1. This Council agrees with the District's objective to adopt a rule that will achieve the maximum feasible, cost effective emissions reductions of nitrogen oxides (NOx) and particulate matter (PM) as well as compliance with current and future federal emissions limits for toxic air contaminants (TACs) in order to protect the health of our citizens.
2. This Council strongly requests that the District adopt the more stringent new and modified standards for Portland cement manufacturing facilities.
3. We wish to express our city's support for the District in applying the highest possible regulatory standards to the Lehigh cement plant that is immediately adjacent to our community.

Responses

1. Reducing emissions of NOx and PM will enable the District to make progress towards attaining federal and state ozone and PM standards. In addition, the proposed regulation includes emissions limits for TACs consistent with those found in the federal National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect public health of area residents.
2. District staff has evaluated the technical feasibility and costs associated with these federal standards as applied to the Lehigh facility. The standards contained in the proposed District regulation represent reasonably achievable cost-effective emission standards for the facility, and in fact represent more stringent standards than the applicable federal rules since, as an existing facility, Lehigh is not subject to the amended NSPS or NESHAP standards for "new or modified" facilities. The District has the authority to adopt emission limits more stringent than those required under federal regulations; however, any emission standard adopted by the District must be evaluated for cost-effectiveness and socio-economic impact as per California law. These analyses are part of the staff report, and staff believes that the proposed rule balances costs with necessary emissions reductions. The proposed regulation contains emissions standards that are as stringent as or more stringent than the applicable standards contained in the federal rules.

3. The District appreciates the City of Cupertino's support in efforts to apply regulatory standards to sources of air pollution in the region and encourages continued interest in rule development efforts.

Los Altos Hills City Council in a letter dated 17 February 2012:

Comment/questions:

4. See comments/questions 1, 2, and 3 above.

Responses

4. See responses 1, 2 and 3 above.

Los Altos City Council in a letter dated 3 April 2012:

Comment/questions:

5. See comments/questions 1, 2, and 3 above.

Responses

5. See responses 1, 2 and 3 above.

Dr. Gary Latshaw in a letter dated 21 May 2012:

Comment/questions:

6. I have been analyzing material on the pollutant emissions from the Lehigh facility along with other related materials. I conclude that current emissions from Lehigh have negative health implications of approximately $600 million over 10-years using the District's Clean Air Plan methodology. My conclusions are substantiated in the attached report, "Citizen's Report on Cement Plant Regulation in the San Francisco Bay Area."
7. The draft regulation does not address sulfur dioxide (SO_2) at all.
8. The draft regulation has a limit for particulate matter (PM) of 0.04 lb/ton of clinker that is substantially above the current PM emissions rate (value of the 0.014 lb/ton of clinker obtained in 2010).
9. The draft regulation should include a PM limit equal to the EPA standard for new and modified plants (0.01 lb/ton of clinker).
10. The draft regulation does not seriously consider emissions reductions achieved by other plants such as the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States.
11. No effort was made to regulate indirect-source emissions from diesel trucks carrying material to and from the facility.

Responses

6. The provided report, "Citizen's Report on Cement Plant Regulation in the San Francisco Bay Area," describes the commenter's estimates of the health costs and benefits of alternative scenarios of emissions at Lehigh based on the District's Multi-Pollutant Evaluation Method (MPEM) described in the 2010 Clean Air Plan. Dr. Latshaw's report took the monetized value of various pollutants and calculated the "health costs" associated with various levels of emissions from Lehigh, including the proposal, the NSPS and a newly permitted plant in Florida. However, the MPEM is not meant to be used to calculate the monetized health effects of emissions from a single source. The monetized values in the MPEM are based on ambient concentrations which accrue from all sources, both natural and anthropogenic, and are applied across the entire region. Staff believe that the proposed limits will reduce emissions and benefit public health, and are the most stringent that are economically feasible.
7. The issue of attainment of the recently revised national one-hour ambient air quality standard for SO_2 is currently in flux and as yet undetermined. District air quality monitoring data show ambient SO_2 levels well below the standard. It is not expected at this time that SO_2 emissions reductions at Lehigh will be required to attain the SO_2 standard. Should the District determine a need for SO_2 reductions from the facility in the future, staff may propose that the rule be amended to include a standard that ensures emissions from the Lehigh facility do not cause an exceedance of the new one-hour ambient air quality standard for SO_2.
8. It is important to note that emissions vary over time due to changes in the production cycle. The proposed PM emission limit that must be met at all times is essentially a one-hour standard as compliance is determined by the average of three one-hour test runs. The 2010 PM emission rate provided in Table 3 is based on an annual average which may include periods when the facility is not in operation. This annual average is based on available emissions data prior to abatement and an assumed abatement efficiency of 99.9%. The PM standard in the proposed rule is 40% less than the applicable federal standard.
9. See response 8 above. The NESHAP standards were modified in the reconsidered proposal of July 18, 2012. The proposed standard for "new and modified" facilities is now 0.02 lb/ton of clinker, and that for existing facilities is 0.07 lb/ton of clinker. The emission limit for PM in the proposed rule is more stringent than the standard in the amended NESHAP (as proposed in June 2012) and is based on that which is achievable utilizing the state of the art controls.
10. It is difficult to apply emissions reductions to the Lehigh facility based on demonstrated performance of control equipment at other facilities. A particular form of control equipment may have a demonstrated control efficiency at one plant, but may not perform as efficiently at another due to differences specific to the two facilities. For example, selective non-catalytic reduction along with staged combustion utilized in the preheater/precalciner can achieve NOx reductions equal to the NSPS standard, but Lehigh does not have staged combustion in their preheater/precalciner. The costs associated with reconstructing their preheater/precalciner in order to meet the NSPS standard would greatly increase the already significant economic impact of the standard proposed in regulation 9-13.

11. Emissions from trucks do not fall within the category of stationary sources and are therefore outside the authority of the District. The California Air Resources Board regulates truck emissions. Truck traffic to and from the facility is beyond the scope of this regulation, but the proposed regulation does include fugitive dust control measures that will help control dust emissions from trucks through on-site speed limits, truck washing, and other track-out minimization provisions.

Rod Sinks in an Email dated 21 May 2012:

Comment/questions:

I ask you to review Dr. Latshaw's report and help all of us by publishing answers to the following questions:

12. Is Dr. Latshaw's analysis accurate? If not, can staff refine or correct it so we all have an accurate assessment of health costs under various scenarios?
13. Who should be paying the large health care cost?
14. If the numbers are right, the draft standard seems to bring down costs a very minor fraction - from $620 mil to $570 mil. Why is the PM 2.5 requirement more lenient than current actuals?
15. If SO2 emissions are such a significant component of health cost, why does the draft not regulate it?
16. Why not require state-of-the-art control using maximum feasible technology and get the cost down to $100 mil?
17. If Lehigh or the Air Board staff claim costs are too high to use maximum feasible technology and meet aggressive standards, what are the financials, specifically, what are the capital costs and how much would the price of cement rise in the Bay Area with the Air Board's proposal and with additional measures toward max feasible technology?
18. Can and will the Air Board staff quantify the health effects of heavy metal pollutants, particularly Mercury and Chromium, as Dr. Latshaw has done for other pollutants?

Responses

12. See responses 6 above. District staff has met with Dr. Latshaw on at least two occasions to discuss his analysis and responded to several emails requesting clarification on information in published reports. See Appendix B for responses to Dr. Latshaw's comments.
13. District staff does not believe Dr. Latshaw's analysis accurately assesses the health care costs, as it applies a model meant for other purposes. Staff believes the question is based on an invalid premise, and is otherwise beyond the scope of this rulemaking effort.
14. The analysis is not valid. See response 8 above.
15. See response 7 above.
16. Again, the analysis is not valid. Staff believes that the proposed rule represents the maximum cost effective standards achievable by the facility at this time. See section 6.0 Economic Impacts of the staff report for more detail.
17. See section 6.0 Economic Impacts and the Socioeconomic Analysis found in appendix C of the Staff report.

18. Staff believes that the MPEM is not appropriate to apply to a single facility. Quantifying health effects as suggested by the commenter goes well beyond the scope of this rule making effort. It is much more appropriate to analyze health effects from ambient concentrations as has been done in the report titled Bay Area Air Quality Management District Summary and Analysis of Cupertino Air Monitoring Results Updated May 16, 2012. This report is available on the District's website in the special reports page of the Air Toxics section of Engineering (http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Special-Reports.aspx).

Bill Almon in a letter provided to the Board of Directors at the meeting 12 May 2012:

Comment/questions:

19. The Lehigh Fact Sheet contains several omissions and inaccurate or false statements in the opinion of the commenter.

Responses

19. Facility Fact Sheets are prepared and periodically updated by District staff to apprise the District Board of Directors and interested members of the public as to the current status of major facilities within the District. This document is not particularly germane to the discussion of rule development efforts, but the status of rule development efforts are contained in the fact sheet. District staff has arranged to meet with Mr. Almon to discuss his comments on the document.

Loma Prieta Chapter of the Sierra Club in a letter dated 9 July 2012:

Comment/questions:

20. The purpose of this letter is to apprise the District of information detailing the health costs of Lehigh's emissions under various pollution control alternatives. Dr. Latshaw's report was provided as an attachment to the letter.
21. Why is it that the draft regulation for particulate matter (PM) of 0.04 lb/ton of clinker is substantially above the value of the 0.014 lb/ton of clinker obtained in 2010?
22. Why is it that the proposed regulation does NOT include sulfur dioxide (SO_2) regulation?
23. Why is it that the regulation for nitrogen oxides (NOx) is 2.3 lb/ton of clinker and not the more protective regulation of 1.5 lb/ton of clinker, which the EPA stipulates in the NSPS regulations?
24. Emissions from Lehigh should be regulated to the same extent as other facilities.

Responses

20. See response 6 above.
21. See response 8 above.
22. See response 7 above.
23. The standards contained in the proposed District regulation represent reasonably achievable cost-effective emission standards for the facility and will result in significant emissions reductions. The imposition of the NSPS limit of 1.5 pounds NOx per ton of

clinker would require a rebuild of the kiln to incorporate staged combustion, in addition to the SNCR control technology that the current standard requires, and at considerably higher cost.

24. Since their initial adoption, the NSPS (1971) and NESHAP (1999) have undergone several amendments with standards generally becoming more stringent at each revision. The pertinent dates for the most recent amendments to the federal rules are June 16, 2008 for the NSPS, and May 6, 2009 for the NESHAP. Lehigh has not undertaken any changes in operation or equipment after the effective dates that could be deemed as "modifications" per the definitions contained in the appropriate sections of the code of federal regulations. The standards contained in the proposed District regulation represent reasonably achievable cost-effective emission standards for the facility, and in fact represent more stringent standards than the applicable federal rules since, as an existing facility, Lehigh is not subject to the amended NSPS or NESHAP standards for "new or modified" facilities.

CUPERTINO

OFFICE OF THE MAYOR
CITY HALL
10300 TORRE AVENUE • CUPERTINO, CA 95014-3255
(408) 777-3212 • FAX (408) 777-3366

February 7, 2012

Jack Broadbent, Director
BAAQMD
939 Ellis Street
San Francisco, CA 94109

Dear Director Broadbent,

We understand that the Bay Area Air Quality Management District (BAAQMD) is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of Oxides of Nitrogen (NOx) and Particulate Matter (PM). We support them in their efforts to ensure that the Lehigh facility complies with current and future emission limits for toxic air contaminants (TACs) consistent with the federal National Emission Standard for Hazardous Air Pollutants (NESHAP). This Council agrees with BAAQMD's objective in order to protect the health of our citizens.

Many of our citizens complain and are concerned about detrimental health effects from the emissions from the plant. The Bay Area is in "non-attainment" for ambient levels of ozone and PM. Because NOx contributes to the formation of ozone, and SO2 and PM contribute to increased levels of PM, reducing emissions of these pollutants would help the Bay Area achieve attainment status. This would make the air we breathe healthier for everyone.

It is the opinion of the Council that maximum feasible, cost effective emission limits can be found in the EPA's new source performance standards for new and modified existing cement plants. Regardless of whether Lehigh meets the legal definition of a modified existing plant, it is in a densely populated area. Thus, this Council strongly requests that the Bay Area Air Quality Management District adopt the more stringent new and modified standards for Portland cement manufacturing facilities.

Air pollution drives up health care costs as well as human suffering. By applying the emission limits found in the new source performance standards to Lehigh, we believe these impacts to our citizens would be reduced.

On behalf of the Cupertino City Council, I wish to express our city's support for BAAQMD to apply the highest possible regulatory standards to the Lehigh cement plant that is immediately adjacent to our community.

The support and ongoing work of the District and its staff is greatly appreciated.

Sincerely,

Mark Santoro
Mayor

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 1, 2012

Mayor Mark Santoro
City of Cupertino
10300 Torre Avenue
Cupertino, CA 95014

Dear Mayor Santoro:

Thank you for your recent letter of support of Bay Area Air Quality Management District (District) rule development efforts to reduce emissions of air pollutants from Portland Cement Manufacturing (proposed Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing). Reducing emissions of nitrogen oxides (NOx) and particulate matter (PM) will enable the District to make progress towards attaining federal and state ozone and particulate standards. In addition, the proposed regulation includes emission limits for toxic air contaminants consistent with those found in the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) to ensure that these emissions are significantly reduced in the Bay Area to protect public health of area residents.

Since the Public Workshop held December 12th of last year at Monta Vista High School in Cupertino, we have received numerous comments from members of the public. Many of these comments have suggested more stringent limits, consistent with the federal New Source Performance Standards. We are in the process of evaluating the technical feasibility and costs associated with these emissions standards as applied to the Lehigh facility. We recognize the important health benefits of improved air quality in the region through the reduction of air pollutant emissions from industrial sources.

We appreciate your support of our efforts to apply regulatory standards to sources of air pollution in the region, and we encourage your continued interest in our rule development efforts. Thank you again for taking the time to express your concerns to the District.

Sincerely,

Jack P. Broadbent
Executive Officer/APCO

JPB:rec

LOS ALTOS HILLS
CALIFORNIA

February 17, 2012

Jack Broadbent
Director
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Re: Proposed Regulation for Portland Cement Manufacturing Facilities

Dear Mr. Broadbent:

It is our understanding that the Bay Area Air Quality Management District (BAAMQD) is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of Oxides of Nitrogen (NOx), Particulate Matter (PM) and other toxic air contaminants. On behalf of the City Council of the Town of Los Altos Hills, I would like to express our wholehearted support for the District's efforts to regulate cement manufacturing facility emissions. We have strong concerns with regard to cement plant emissions because of the Town's proximity to the Lehigh Cement Company's quarry and cement processing operations in neighboring Cupertino. The scope of the proposed rule appears to ensure that the Lehigh facility will comply with current and future emission limits for toxic air contaminants (TACs) consistent with the National Emission Standard for Hazardous Air Pollutants (NESHAP). The Los Altos Hills City Council completely agrees with BAAMQD's objective in order to protect the health of our citizens.

Many of our citizen complaints and concerns are regarding the detrimental health effects from the emissions from the plant. The Bay Area is in "non-attainment" for ambient levels of ozone and PM. Because NOx contributes to the formation of ozone, and SO2 contributes to increased levels of PM, reducing emissions of these pollutants would help the Bay Area achieve attainment status. This would make the air we breathe healthier for everyone.

It is the opinion of the City Council that maximum feasible, cost effective emission limits can be found in the EPA's new source performance standards for new and modified existing cement plants. Regardless of whether Lehigh meets the legal definition of a modified existing plant, it is in a densely populated area. Thus, this Council strongly

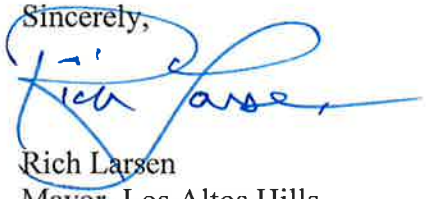
26379 Fremont Road
Los Altos Hills
California 94022
650/941-7222
Fax 650/941-3160

urges the BAAQMD Board to adopt the more stringent new and modified standards for Portland cement manufacturing facilities.

Air pollution drives up health care costs as well as human suffering. By applying the emission limits found in the new source performance standards to Lehigh, we believe these impacts to our citizens would be reduced.

The support and ongoing work of the District and staff in protecting and improving our air quality is greatly appreciated.

Sincerely,



Rich Larsen
Mayor, Los Altos Hills

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 1, 2012

Mayor Rich Larsen
City of Los Altos Hills
26379 Fremont Road
Los Altos Hills, CA 94022

Dear Mayor Larsen:

Thank you for your recent letter of support of Bay Area Air Quality Management District (District) rule development efforts to reduce emissions of air pollutants from Portland Cement Manufacturing (proposed Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing). Reducing emissions of nitrogen oxides (NOx) and particulate matter (PM) will enable the District to make progress towards attaining federal and state ozone and particulate standards. In addition, the proposed regulation includes emission limits for toxic air contaminants consistent with those found in the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) to ensure that these emissions are significantly reduced in the Bay Area to protect public health of area residents.

Since the Public Workshop held December 12th of last year at Monta Vista High School in Cupertino, we have received numerous comments from members of the public. Many of these comments have suggested more stringent limits, consistent with the federal New Source Performance Standards. We are in the process of evaluating the technical feasibility and costs associated with these emissions standards as applied to the Lehigh facility. We recognize the important health benefits of improved air quality in the region through the reduction of air pollutant emissions from industrial sources.

We appreciate your support of our efforts to apply regulatory standards to sources of air pollution in the region, and we encourage your continued interest in our rule development efforts. Thank you again for taking the time to express your concerns to the District.

Sincerely,

Jack P. Broadbent
Executive Officer/APCO

JPB:rec

Office of the Mayor
One North San Antonio Road
Los Altos, California 94022-3087
(650) 947-2720
Fax (650) 941-2731

April 3, 2012

Jack Broadbent
Director
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

SUBJECT: PROPOSED REGULATION FOR PORTLAND CEMENT MANUFACTURING FACILITIES

Dear Mr. Broadbent:

We understand that the Bay Area Air Quality Management District (District) is considering adoption of Regulation 9, Rule 13 to achieve maximum feasible, cost effective emissions reductions of Oxides of Nitrogen (NOx), Particulate Matter (PM) and other toxic air contaminants.

The City Council of Los Altos wholeheartedly supports the District's efforts to adopt this Rule that will better equip the District to regulate in particular cement plant emissions. We have strong concerns about cement plant emissions from the nearby Lehigh Cement Company's quarry and cement manufacturing operations in the unincorporated area southwest of Los Altos. The scope of the proposed rule appears to ensure that the Lehigh facility will comply with current and future emission limits for toxic air contaminants consistent with the National Emission Standard for Hazardous Air Pollutants. The Los Altos City Council completely agrees with the District's objective in order to protect the health of our citizens.

Awareness of the Lehigh Cement Company's activities has increased recently as a result of the public process for permitting of continued and expanded uses of the Lehigh facility. The existence of the operations involved with cement processing in close proximity to residential areas and schools suggests the need for close oversight of activities that could potentially pose unwanted health and environmental impacts. The Bay Area is in "non-attainment" for ambient levels of ozone and PM. Because NOx contributes to the formation of ozone, and cement plant activities contribute to PM, reducing emissions of these pollutants would help the Bay Area achieve attainment status. The air we breathe would be healthier for everyone.

It is the opinion of the City Council that maximum feasible, cost effective emission limits can be found in the EPA's new source performance standards for new and modified existing cement plants. Regardless of whether Lehigh meets the legal definition of a modified existing plant, it is in a densely populated area. Thus, the Los Altos City Council strongly urges the District's Board to adopt the more stringent new and modified standards for Portland cement manufacturing facilities.

Air pollution drives up health care costs as well as human suffering. By applying the emission lmits found in the new source performance standards to Lehigh, we believe these impacts to our citizens would be reduced.

Thank you for the support and ongoing work of the District and staff in protecting our health and improving air quality.

Sincerely,

Valorie Cook Carpenter
Mayor, City of Los Altos

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

May 17, 2012

Mayor Valorie Cook Carpenter
City of Los Altos
One North San Antonio Road
Los Altos, CA 94022

Dear Mayor Carpenter:

Thank you for your recent letter of support of Bay Area Air Quality Management District (District) rule development efforts to reduce emissions of air pollutants from Portland Cement Manufacturing (proposed Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing). Reducing emissions of nitrogen oxides (NOx) and particulate matter (PM) will enable the District to make progress towards attaining federal and state ozone and particulate standards. In addition, the proposed regulation includes emission limits for toxic air contaminants consistent with those found in the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) to ensure that these emissions are significantly reduced in the Bay Area to protect public health of area residents.

Since the Public Workshop held December 12th of last year at Monta Vista High School in Cupertino, we have received numerous comments from members of the public. Many of these comments have suggested more stringent limits, consistent with the federal New Source Performance Standards. We are in the process of evaluating the technical feasibility and costs associated with these emissions standards as applied to the Lehigh facility. We recognize the important health benefits of improved air quality in the region through the reduction of air pollutant emissions from industrial sources.

We appreciate your support of our efforts to apply regulatory standards to sources of air pollution in the region, and we encourage your continued interest in our rule development efforts. Thank you again for taking the time to express your concerns to the District.

Sincerely,

Jack P. Broadbent
Executive Officer/APCO

JPB:rec

To: Ms Gayle B. Uilkema, Chairperson of the Stationary Source Committee of BAAQMD, John Gioia, Vice Chariperson, committee members: Susan Garner, Carol Klatt, Jim Spering, Johanna Partin, David Hudson, Eric Mar, John Avalos, and , Mr. Jack Broadbent, Chief Executive Office/Air Pollution Control Officer for BAAQMD,

From: Gary Latshaw, Ph.D., retired physicist in Cupertino

Subject: Regulations for Cement Plants (Regulation 9, Rule 13)

Date: May 21, 2012

I have been analyzing materials on the pollutant emissions from the Lehigh Cement Plant. This analysis has included the Federal Regulations for Cement Plants, the BAAQMD's Clean Air Plan 2010, the BAAQMD's Draft Regulations (as described in the Workshop Report dated November 20110), the Florida Technical Evaluation for their CEMEX Cement Plant, and other related materials. Computer files of these materials are in the attached CD.

My conclusion, which is substantiated in the attached report "Citizen's Report on Cement Plant Regulation in the San Francisco Bay Area" (print and file attached), is simply that the current emissions from the Lehigh Cement Plant have negative health implications of approximately 600 million dollars (assuming 2010 emission ratios at full production) over 10-years using BAAQMD's CAP methodology.

The proposed regulations described in the workshop report only reduce this by about 10%. Applying more protective regulations such as those described by the EPA for "New or Modified" Plants would result in a 60% reduction over 2010 emission rates. The EPA's position on this matter can be substantiated by the Table 10 in the referenced Florida report, which shows many plants regulated at levels below those for "New and Modified" (reproduced in my appendix E).

Moreover, my analysis has revealed a multitude of techniques that offer even greater protection. I am estimated as much as 80% of the current health impact dollars could be reduced. The attached Citizen's Report references many plants and techniques achieving high levels of protection

Specific deficiencies in the Draft Regulations are:

- The draft regulation does not address SO_2 at all.
- The draft regulation for particulates actually stipulates an emission ratio that is greater (less protective) than what was observed in 2010 (2010 actuals: 0.014 lb/ton of clinker vs proposed regulation: 0.04 lb/ton of clinker)!
- The WS draft regulation for particulates should adopt the EPA's for "New and Modified" Plants (0.01 lb/ton clinker).
- The analysis in developing the draft regulations did not seriously consider emission reduction ratios achieved by other plants such the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States (see Appendix E and Removal Techniques section).
- No attempt was made to regulate the indirect-source emissions from diesel trucks carrying material to and from the facility.

As the BAAQMD continues to refine the regulations, I hope their deliberations lead to more protective measures than the November draft regulations. As BAAQMD's Clean Air Plan states, it is the most vulnerable amongst us who are most directly effected by air pollution. The young, the elderly and those suffering repertory diseases are the ones most dependent on BAAQMD insisting on the most advanced technologies are applied to protect the health of all Bay Area residences.

Sincerely,

Gary Latshaw, Ph.D.
Glatshaw@gmail.com

Attachments: Hardcopy "Citizen's Report on Cement Plant Regulation in the San Francisco Bay Area"; CD with files: Citizen's Report; BAAQMD Workshop November 2011, BAAQMD Clean Air Plan 2010, Florida Technical Evaluation…,, Letter to BAAQMD and Stationary Source Committee May 21, 2012

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

This is an analysis of the 10-year health implications of the air pollution from the Lehigh Cement Plant using alternative emission scenarios. The analysis is based on documents from Bay Area Air Quality Management District (BAAQMD) and the Environmental Protection Agency (EPA). The primary results are summarized in the graph below.

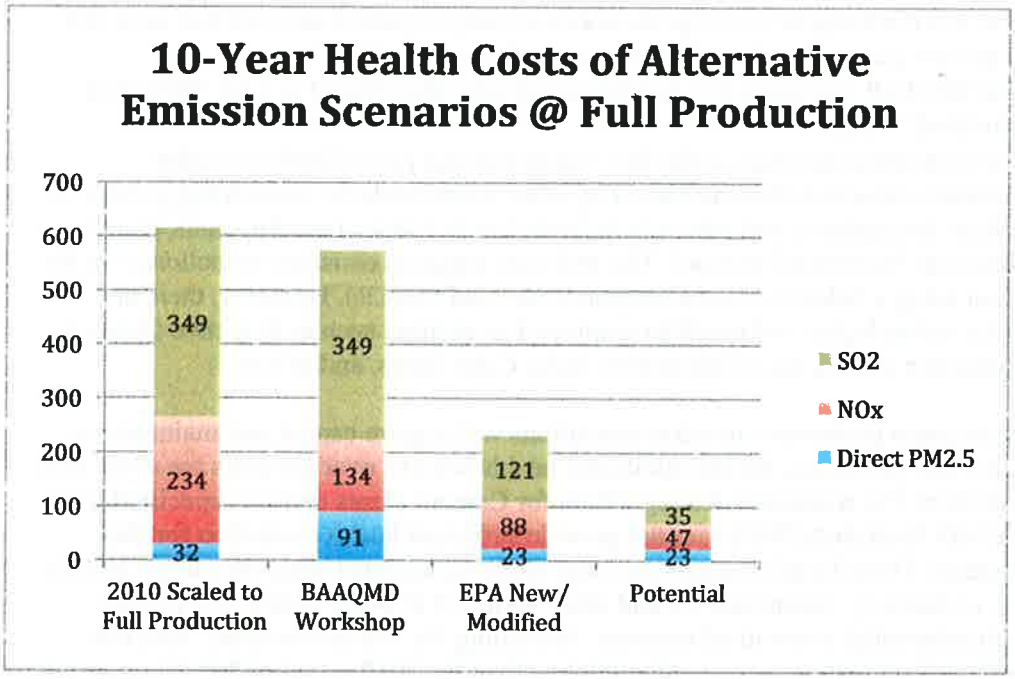


Figure 1 – 10-Year Health Costs (or Benefit of Removing Pollutants) All calculations presume full production of 1,600,000 tons of clinker.

As seen in the graph:

- The proposed regulations in the BAAQMD Workshop (WS) result in only minimal improvement (reduction) in health costs (41 million dollars) relative to actual 2010 emission ratios.
- The regulations by the EPA for "New and Modified" Plants would result in much greater improvement (reduction) to health costs (384 million dollars).
- Moreover, there are technologies that have not been fully investigated that could potentially provide even greater health savings (511 million dollars)
- The assignment of health costs to the emissions is based on the methodology in BAAQMD's Clean Air Plan 2010 (CAP). The use of the term "health costs" in this analysis is synonymous to the CAP's terminology "$$Benefit of Reducing".
- It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker. These health impacts do not include the effects of mercury, chromium VI, and other toxins.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

While the state-of-the-art in assigning health implications vs. emission levels is only approximate, I believe it is accurate to state that the costs over 10 years are many hundreds of millions of dollars while the equipment to reduce them substantially have costs of tens of millions of dollars. The WS regulations have these specific deficiencies:

- The WS draft regulation does not address SO_2 at all.
- The WS draft regulation for particulates actually stipulates an emission ratio that is greater (less protective) than what was observed in 2010!
- The WS draft regulation for particulates should adopt the EPA's for "New and Modified" Plants.
- The analysis in developing the WS regulations did not seriously consider emission reduction ratios achieved by other plants such the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States (see Appendix E and Removal Techniques section). The WS draft suggests emission reduction from the plant using a Selective Non-Catalytic Reduction (SNCR). However, there are other technologies that could be employed in addition such as Selective Catalytic Reduction (SCR), use of alternative fuels, Coke filters, and others.

Certainly the more protective emission regulations will require capital and maintenance costs are the part of Lehigh, but the additional health benefits over 10-years are about half a billion dollars! The recommended regulation for Cement Plants that was specified in the BAAQMD Workshop (WS) does not provide sufficient health protection for Bay Area Residents. These health impacts are most likely understated since they don't include the effects of mercury, chromium VI, and other toxins. It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA regulation for "New and Modified" Plants of 21 lb/ton-clinker.

The Federal Register in describing the regulations specifies proven technologies that have reduced emissions even more than those regulations. US Public Health Code 42 USC 7416 allows local government agencies to impose stricter regulations than the EPA regulation. In particular, since the Bay Area is already a non-attainment region regarding air quality, and the Lehigh Plant is unique in California for being adjacent to a large metropolitan area, I feel it is appropriate to regulate to the most technologically achievable emissions. Those technologies are apparently capable of removing almost all the emissions. As I explain in the section "Removal Techniques," I surmised after evaluating these materials that the regulations could be placed at on 10% of the SO_2 2010 emission ratios and at 20% of the NOx 2010 emission ratios. The Florida Division of Air Regulation (FLTE) did an analysis that provides evidence (see Appendix E) of actual regulations at many plants near my suggested SO_2 level in 2007.

Residents of the entire Bay Area would receive the health benefits from more protective regulations. While the residents near the plant have been the most vociferous in their requests for more protective measures, the health benefits will come to the entire community. The 500 million dollar savings due to reduced emissions would most likely far exceed the capital equipment and maintenance costs that Lehigh would incur.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

The health benefits from the more protective regulations are, because of the limited information available, understated from what would likely be achieved. The CAP only treated ten pollutants (excluding CO2), and the emissions from the plant were only available for nine of those pollutants. This results in not treating the health costs from mercury, chromium VI, ammonia, and other pollutants with known health effects. The proposed regulations depart from BAAQMD's recommended regulations in the treatment of SO_2, NOx, and particulates (PM).

CO2 was not included in this analysis since although the effects of CO2 on climate change and health effects are real and significant, the CO2 emissions will occur either locally or somewhere else to produce the needed cement.

Diesel Truck Emissions

Also, neither this analysis nor the BAAQMD's analysis considers the impacts of the diesel truck traffic on the residents who live near the segments of Steven's Creek Blvd and Foothill Expressway where most of the truck traffic travels. In recent years, it has become evident to scientists that diesel exhaust has significant health effects to those who live near major diesel traffic routes.

Analysis

The subsequent tables (1-4) provide detailed the health impacts by each pollutant from Lehigh for different scenarios. Colors are used in the tables to indicate the source of information. Appendix A is a reference where all the sources are identified. An emission ratio is the amount of a pollutant emitted (in pounds) per ton of clinker produced. Clinker is the primary product of cement production. These tables assume the licensed production of 1,600,000 tons of clinker. The tables present the results for the primary pollutants: SO_2, NOx, and PM 2.5, which were described in Figure 1 along with minor contributions from other pollutants. The other pollutants are reactive organics (ROG), benzene, diesel PM2.5, 1,3-butadiene, acetaldehyde, formaldehyde, and ammonia. Appendix C shows the health impact factors (red) that have been used from the CAP.

In developing the health impact costs, emission ratios of ROG, Benzene, Diesel PM 2.5, 1,3-Butadien, Formaldehyde, and Ammonia were calculated using the emission values in the "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix". This report was produced by the consulting firm of AMEC Geomatrix under contract to Lehigh. In particular, Table ES-2 (see Appendix D), was used to develop the emission ratios based on a low production of 847,000 tons of clinker in 2010. The emission ratios are displayed with a brown background. The values are much smaller than the top three pollutants.

The tables represent annual health costs, but decisions on "health costs" vs. "reduction equipment and maintenance costs" should consider a 10-year period since most of the

costs for reduction are capital equipment costs, which would be amortized over 10-years or even longer. Note that over 99% of the health impact is due to NOx, SO_2 , and PM emissions. Table 5 summarizes the emission ratios used throughout.

Table 1 – BAAQMD Recommendations in Workshop Report (November 2011) based on EPA "Existing" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	1.150	920.00	$34,868,000	WS page 6 -2010 actuals
NOx	$7,300	2.300	1,840.00	$13,432,000	WS page 15
Direct PM2.5[2]	$456,400	0.014	19.84	$9,054,976	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$57,500,130	

[1]SO2 is not proposed to be regulated in this case. Actual emission ratios based on the WS report were used.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

Table 2 assumes the plant operates with the EPA regulations for "New or Modified" Plants and is operating at full licensed capacity. The table shows 57.5 million dollars in annual health costs.

Table 2 EPA "New or Modified" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	**0.40**	320.00	$12,128,000	WS page 7
NOx	$7,300	**1.500**	1,200.00	$8,760,000	WS page 7
Direct PM2.5[2]	$456,400	**0.01**	4.96	$2,263,744	WS page 7
ROG	$4,800	**2.550E-02**	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$23,296,898	

[1]SO2 is now assumed to be regulated.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012

Table 3 assumes that the plant is operating at licensed production levels of 1,600,000 tons of clinker. The emission ratios for SO_2 are 10% of 2010 actuals and NOx are 20% of 2010 actuals based on what has been achieved elsewhere. The PM ratio is directly from the EPA's regulation for "New or Modified" Plants

Table 3: Technologically Achievable

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2	$37,900	0.115	92.00	$3,486,800	WS: page 6
NOx	$7,300	0.80	640.00	$4,672,000	WS: page 6
Direct PM2.5	$456,400	0.01	4.96	$2,263,744	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$10,567,698	

Gary Latshaw, Ph.D.

Table 4 is provided for comparison to these alternative regulations as it represents the actual emission ratios (from WS: page 6) and then presumes full licensed production of 1,600,000 tons of clinker.

Table 4 -2010 actual ratios @ 1,600,00 tons Production

Pollutant	$Benefit/yr-ton	avg lb/ton clinker	tons/year	Cost/yr	Notes on Emission Ratios
SO2	$37,900	1.150E+00	920.00	$34,868,000	WS: page 6
NOx	$7,300	4.000E+00	3,200.00	$23,360,000	WS: page 6
Direct PM2.5	$456,400	8.680E-03	6.94	$3,169,242	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$61,542,395	

Table 5 shows the emission ratios used in creating the health costs. These emission ratios were multiplied by the licensed production of clinker (1,600,000 tons/yr). With the exception of "Potentially Achievable", the ratios in this table are from the WS. The "Potentially Achievable" are my estimate based on reading the literature.

Table 5 Alternative Regulations (Pounds of Pollutant/ton of clinker)

Pollutant	2010 Actuals	Draft Workshop	EPA New/ Modified	Potentially Achievable
SO2	1.15	None*	0.40	0.115
NOx	4.00	2.300	1.50	0.80
PM 2.5	0.014	0.04	0.01	0.01

Since no regulation of SO_2 was proposed, this analysis assumed that the 1.15 actual for 2010. The health impacts from these three pollutants represent 99% of the total impact.

Citizen's Report on Cement Plant Regulation in the
San Francisco Bay Area
Gary Latshaw, Ph.D. May 20, 2012
Gary Latshaw, Ph.D.

Removal Techniques

The rationale for recommending more protective measures for SO_2, NOx, and particulates (PM) than the WS recommended is presented subsequently. The following analysis argues that more protective techniques are available to reduce the emissions to even less than the EPA's "New/Modified".

SO_2

This analysis reveals that there is the potential to regulate Lehigh at a SO2 production ratio of 0.115 lb/ton or perhaps even more protective. At this production ratio, health benefits associated with SO_2 reduction of 314 million dollars would accrue over 10 years (relative to 2010). The 2010 actual ratio was 1.15 lb/ton. The WS has no regulation for SO2 stipulated. The EPA level for "New or Modified" Plants is 0.4 lb/ton.

As stated the WS does not specify any regulation on SO2. The WS (page 17) states that: "Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh may trigger an exceedance of the new ambient standard; however, these modeling results do not correlate well with local monitoring data." The WS goes on to argue that the complex terrain makes these modeling results suspect. However, what is not discussed is that the majority of the monitoring is at a site that is close to trees and insulated from the Plant by hills. These trees will remove pollutants from the atmosphere and the hills will divert most of the pollutants away from the monitoring station.

SO2 is an extremely potent pollutant with a very high health benefit of removal – hundreds of millions of dollars over 10 years. In addition to the chemical having harmful health effects, it is also a precursor to the development of fine particulate (PM2.5) in the atmosphere, According to the FAR (page 54984): "Reducing SO2 emissions also reduces PM2.5 formation, human exposure, and the incidence of PM2.5-related health effects, among them premature mortality and cardiovascular and respiratory morbidity."

The NESHAP federal regulations require for "New and Modified" Cement Plants a limit of SO_2 emissions at 0.4 lb/ton of clinker. According to the table on page 6 of WS, Lehigh emitted 1.15 lb/ton of clinker of SO2 in 2010. The report indicates in several places that measures to reduce the production of other pollutants should also lower SO2 levels. I feel it is only reasonable to specify a regulation. It is noteworthy that Lehigh emitted 181 tons of SO_2 in 2008 (page 3 of WS). If production levels in 2008, which were not specified, were similar to 2010, then in 2008 the ratio of SO_2/ton of clinker would be 0.2 lb/ton of clinker – an emission ratio less than the proposed regulation.

The referenced statements below provide evidence that 90% of the SO_2 emissions (relative to 2010) can be removed. A removal efficiency of 90% relative to 2010 actuals would provide an emissions ratio of 0.115 lb/ton of clinker. However, the 2010 production of SO2 is 1.15 lb/ton, which has been reduced from completely unregulated

probably due to the injection of lime in the kiln. Starting at an already reduced level may not allow the post-processing methods to extract 90% of the remaining.

- Appendix A of the CAP (page A-26) states that retrofitting an SO_2 scrubber into the flue gas train would remove 90% of the SO_2.

- The WS identifies in some detail the way a SO2 can be controlled by scrubbing, but then never suggests any regulation of SO2. On page 14 of the WS:

    - "Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser extent metal and ammonia emissions. This is the most commonly used method of desulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased CO_2 emissions, increased water consumption and risk of water contamination, and increased operational costs."

- The FAR has several examples of very high efficiencies in removing SO_2. Quoting the FAR in several places:

    - "We also note that SO2 scrubbers in the utility industry have consistently achieved 90 percent SO2 since since the 1970s. We see no technical reason that the same removal levels are not achievable in the cement industry." (page 55019)

    - "State commenters (60) and (72) state that the Ash Grove Chanute PH/C kiln in Kansas achieves less than 0.30 lb SO2/ton despite high sulfur in the raw materials without even using a wet scrubber. State commenter (60) states that this performance is attained using important innovations (The F.L. Smidth DeSOx system and Envirocare Micromist Lime system) not yet assessed by EPA. Attachments provided as part of the comment describe these technologies. State commenter (60) states that without controls, the proposed Chanute kiln would emit SO2 at the high rate of 12 lb/ton from raw material sources alone (*i.e.,* exclusive of fuel SO2). According to state commenter (60), using the described technology, actual emissions from the Ash Grove Chanute kiln are less than 0.25 lb SO2/ ton." (page 55016)[Note: The reduction at Ash Grove from an unregulated

production of 12 lb/ton to 0.25 lb/ton represents a 98% removal efficiency.]

- "According to State commenter (60), the Holcim Siggenthal PH kiln in Switzerland achieves approximately 0.05 lb SO2/ton using the POLVITEC coke filter installed in the 1990's. The POLVITEC system is used with various concurrent operational practices to control NH_3 (from an SNCR system), SO2, PM and metals. Among several functions, the coke filter captures the non-fuel SO2 generated in the PH. The coke is subsequently crushed and then burned with fuel in the main kiln burner. The SO2 from the PH then behaves like fuel SO2 and is incorporated into the clinker. Further details are available in an attachment submitted with the comment. The State commenter also states that SO2 emissions would be significantly less than 0.10 lb/ton of clinker. According to the State commenter, the Siggenthal plant emits much less SO2 than the average of Holcim cement plants in Switzerland and clearly less than 0.10 lb SO2/ton." (page 55016)

- "State commenter (60) states that good SO2 control will make it possible to employ more aggressive NO_X control and that the control of NO_X and SO2 will also minimize the formation of ozone and fine PM in the environment. State commenters (68, 70, 71) stated that State and local experts, who have had long experience with this industry, believe that the proposed NSPS limit for SO2 does not reflect what most plants are capable of achieving." (page 55016) [Note: NSPS refers to an emission ratio of 0.4 lb/ton.]

NOx

This analysis reveals that it is reasonable to regulate Lehigh at a NOx production ratio of 0.8 lb/ton (This represents an 80% reduction over 2010). At this production ratio, health benefits of 187.0 million dollars would accrue over 10 years (relative to 2010). The 2010 actuals were 4.0 lb/ton. The WS has suggested 2.3 lb/ton. The EPA level for "New or Modified" Plants is 1.5 lb/ton.

Nox is a major contributor to the formation of ozone, which is an established pollutant causing both ill health and eye irritation. Although the health benefit in reducing Nox is less than that for SO_2, there are substantial health benefits in regulating it to the maximum feasible level. Reducing the SO_2 emissions will aid in the removal of Nox.

Nox has two distinct sources in the production of clinker:

- Since nitrogen N_2 is a major component of air (80%), the high temperatures reached in the kiln cause N_2 to oxidize and form various nitrous oxides (Nox).

- Nitrogen compounds are frequently found in input materials and therefore contribute to the formation of Nox during the combustion process.

The referenced documents below provide ample evidence that 80% of these emissions (relative to 2010) can be removed. A removal efficiency of 80% relative to 2010 actuals would provide an emissions ratio of 0.8 lb/ton of clinker. Quotes are from the FAR.

- Selection of the fuel can greatly effect the production of Nox.
  - More volatile fuels burn more efficiently at a lower temperature and produce lower Nox during combustion.
  - Nitrogen in the combustion material will contribute to increased emissions. "Typically, fuel nitrogen in coals used by PH/PC kilns varies between 1.0 and 2.0 percent. This difference can impact the uncontrolled NOX by as much as 1.5 lb/ ton of clinker." (page 55014)
  - Given the above advantages of a low-volatile, low-nitrogen fuel, consideration should be made of returning to the use of natural gas, whose price has come down recently.

- "The results from the existing Radici Cementeria di Monselice PH kiln where emission reductions to values as low as 0.20 lb NOX/ton were demonstrated by installation of a SCR system. The supplier guaranteed reduction of 90 percent and realized reductions as high as 97 percent." (page 55010)

- "The commenter states that with the improved processes that lower uncontrolled NOX emissions and with the addition of SCR, NOX limits of 0.25–0.5 lb NOX/ton clinker are achievable." (page 55010 and 55011)

- "State commenter 60 states that based on the foregoing, reductions on the order of 75 percent are achieved by well-designed SNCR systems and 90 percent by SCR." (page 55010) [Note: This analysis is recommending only a 80% reduction.]

The high levels of emission removal were achieved by using two complementary technologies: Selective Catalytic Removal (SCR) and Selective Non-Catalytic Removal (SNCR). The WS discusses the two technologies, but requests only the SNCR be implemented. Even more reduction is probably available thorough the use of POLVITEC coke filter installed in the 1990's in Switzerland.

Particulates

This analysis adopts a PM emission ratio of 0.01 lb/ton. At this production rate, a 10-year savings in health costs of 90.6 million dollars would accrue. This ratio was adopted from the EPA's recommendation for "New and Modified" Plants. That ratio was based on the use of existing fabric and membrane technologies (page 54995 of the FAR). The 2010 production ratio was 0.014 lb/ton or only 40% greater than this recommendation. The WS

specified a production ratio of 0.04 lb/ton – this is a ratio, which is more relaxed than the 2010 actuals.

The health impact of particulates is primarily due to the fine particulate component – particulates smaller than 2.5 um. There are no known measurements of the PM 2.5 fraction from Lehigh. In doing the calculations, it was assumed that the ratio of PM 2.5/PM was 62% - a figure from the California Air Resource Board that may not reflect the conditions at Lehigh.

Monitoring

The monitoring of the emissions from the plant must be upgraded as follows:

- All emissions should be released from a single stack.
- Continuous Monitoring of the gases must be adopted to quickly detect faulty equipment. Also, ammonia emissions must be monitored. The removal mechanisms for NOx can result in an inadvertent release of ammonia, which is not a problem at this time, so monitoring is essential in the future.
- Continuous Monitoring of particulate emissions must be adopted to quickly detect faulty equipment – in particular rips in the filter bags

Citizen's Report on Cement Plant Regulation in the
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Appendix A – Color Coding and Abbreviation of References

(CAP) Clean Air Plan Voume 1, BAAQMD, Adopted Sept 15, 2010 by ABAG, MTC, BCDC http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20II%20%20Appendices.ashx http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20II_Sections%20A-F.ashx
AMEC Report: "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix Note: This report was provided on a DVD by BAAQMD
(WS) Workshop Report by Robert Cave," BAAQMD Reg 9, Rule 13:…", November 2011" Bay Area Clean Air Plan Stationary Source Control Measure SSM-9 – Workshop Report November 2011" http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/Workshops/2011/0913_WR_111511.ashx?la=en
Emission Calculation based on AMEC Report, and WS Clinker Production, Table ES-2,
(FAR) Federal Register Vol 75, No. 174, Thursday, September 9, 2010, Rules and Regulations http://www.gpo.gov/fdsys/pkg/FR-2010-09-09/pdf/2010-21102.pdf
(FLTE) The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. http://www.dep.state.fl.us/air/emission/construction/cemex/TEPD384A.pdf

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Pollutant Reduction Equipment
Appendix B

Input Materials

Aside from the equipment itself, the emissions will be dependent on the input materials used in the processing. The source of heating fuel and carbon material for the processing can be coke, coal, or natural gas. In general, natural gas will have fewer impurities such as sulfur or mercury. Various purities of coke and coal are available.

Injection of Absorbent Materials

Activated Charcoal or lime can be injected into the process to remove toxics such as mercury and control SO2. The type, amount and rate of injection will all effect the efficiency removal.

Selective Non-Catalytic Reduction (SNCR)

This technique involves the injection of an nitrogen rich chemical such as ammonia or urea into the exhaust streams. It is employed to remove NOx and is recommended in the WS.

Selective Catalytic Reduction (SCR)

This technique is similar to SNCR, but a catalyst is present. It operates at a lower temperature (570-700 F). SCR is a less tested technique and does require removal of dust. As pointed out in the WS, some plants do have both SNCR and SCR. Both of these techniques use the introduction of a nitrogen rich chemical and thus care must be taken that only minimal amounts of ammonia are emitted. This concern is called "ammonia slip."

Coke Filter

The entire exhaust stream can be filtered coke. The coke acts as an absorbent and removes pollutants. The highly efficient Swiss Plant Holcim Siggenthal PH has a POLVITEC coke filter.

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Appendix C – Health Impact Factors
From BAAQMD's CAP

Relative Value of Emission Reductions Based on MPEM

The MPEM can be used to compare the benefit of reducing the various air pollutants, as shown in Table 1-2. For this exercise, the MPEM was used to calculate the value of reducing one ton of each pollutant or precursor that is included in the methodology. The relative weight for each pollutant was then determined, using ROG as the unit of comparison. Since studies show that PM is the predominant cause of air pollution-related mortality, as discussed below, and mortality has by far the highest value ($6.9 million) among the health endpoints used in the MPEM, it is not surprising that the MPEM-derived weighting factor for PM reductions is much higher than for the other pollutants analyzed. These weighting factors are instructive for purposes of comparing the value of reducing the various pollutants. They can also be used to calculate the weighted tons of emissions reduced by various control measures for purposes of comparing their overall air quality and climate protection benefit.

Table 1-2. Dollar value of reducing one ton per year of each pollutant using MPEM.

Pollutant	$$ Benefit: Reducing One Ton Per Year	Weighting Factor *
ROG	$4,800	1.0
NOx	$7,300	1.5
Diesel PM2.5	$459,300	96.1
Direct PM2.5 (no diesel)	$456,400	95.5
SO2	$37,900	7.9
Ammonia	$53,500	11.2
Acetaldehyde	$5,300 ($500 plus $4,800 as ROG)	1.1
Benzene	$ 12,000 ($7,200 plus $4,800 as ROG)	2.5
1,3-Butadiene	$30,200 ($25,400 plus $4,800 as ROG)	6.3
Formaldehyde	$ 6,000 ($1,100 plus $4,800 as ROG)	1.2
CO2 equivalent	$28	0.03

TABLE ES-2

SUMMARY OF FACILITY EMISSION RATES
Lehigh Southwest Cement Company
Cupertino Facility

		Annual Average (lb/yr)			Maximum Hourly (lb/hr)		
CAS No.	Chemical	2005 Production	Average Production in 2008/2009	2010 Production [1]	2005 Production	Average Production in 2008/2009	2010 Production [1]
75070	Acetaldehyde	1.16E+03	6.71E+02	7.03E+02	1.68E-01	1.68E-01	1.68E-01
107028	Acrolein	4.49E+01	2.61E+01	2.73E+01	6.51E-03	6.51E-03	6.51E-03
7440382	Arsenic	2.30E+00	1.37E+00	1.43E+00	4.83E-04	4.83E-04	4.83E-04
56553	Benz[a]anthracene	1.31E-02	7.60E-03	7.96E-03	1.90E-06	1.90E-06	1.90E-06
71432	Benzene	9.65E+03	5.60E+03	5.86E+03	1.40E+00	1.40E+00	1.40E+00
50328	Benzo[a]pyrene	2.95E-04	1.71E-04	1.79E-04	4.27E-08	4.27E-08	4.27E-08
205992	Benzo[b]fluoranthene	1.87E-03	1.08E-03	1.14E-03	2.71E-07	2.71E-07	2.71E-07
207089	Benzo[k]fluoranthene	2.95E-04	1.71E-04	1.79E-04	4.27E-08	4.27E-08	4.27E-08
100447	Benzyl chloride	1.01E+02	5.87E+01	6.14E+01	1.47E-02	1.47E-02	1.47E-02
7440417	Beryllium	7.35E-01	4.44E-01	4.63E-01	1.47E-04	1.47E-04	1.47E-04
106990	1,3-Butadiene	9.18E+01	5.33E+01	5.58E+01	1.33E-02	1.33E-02	1.33E-02
7440439	Cadmium	1.04E+00	6.26E-01	6.54E-01	2.22E-04	2.22E-04	2.22E-04
56235	Carbon tetrachloride	6.16E+01	3.57E+01	3.74E+01	8.94E-03	8.94E-03	8.94E-03
108907	Chlorobenzene	5.54E+02	3.21E+02	3.37E+02	8.04E-02	8.04E-02	8.04E-02
67663	Chloroform	2.87E+01	1.66E+01	1.74E+01	4.16E-03	4.16E-03	4.16E-03
18540299	Chromium VI	2.19E+00	1.29E+00	1.35E+00	3.97E-04	3.97E-04	3.97E-04
218019	Chrysene	3.86E-02	2.24E-02	2.35E-02	5.60E-06	5.60E-06	5.60E-06
7440508	Copper	1.51E+01	9.25E+00	9.64E+00	3.44E-03	3.44E-03	3.44E-03
1175	Crystalline silica	1.04E+03	7.27E+02	7.48E+02	3.28E-01	3.28E-01	3.28E-01
53703	Dibenz[a,h]anthracene	2.95E-04	1.71E-04	1.79E-04	4.27E-08	4.27E-08	4.27E-08
106467	p-Dichlorobenzene	5.89E+01	3.42E+01	3.58E+01	8.54E-03	8.54E-03	8.54E-03
75343	1,1-Dichloroethane	1.98E+01	1.15E+01	1.20E+01	2.87E-03	2.87E-03	2.87E-03
78875	1,2-Dichloropropane	2.71E+01	1.57E+01	1.65E+01	3.94E-03	3.94E-03	3.94E-03
542756	1,3-Dichloropropene	1.11E+02	6.45E+01	6.75E+01	1.61E-02	1.61E-02	1.61E-02
9901	Diesel PM	2.47E+01	2.47E+01	2.47E+01	9.73E-01	9.73E-01	9.73E-01
75003	Ethyl chloride	3.87E+01	2.25E+01	2.35E+01	5.62E-03	5.62E-03	5.62E-03
100414	Ethylbenzene	9.59E+02	5.56E+02	5.83E+02	1.39E-01	1.39E-01	1.39E-01
106934	Ethylene dibromide	6.02E+01	3.49E+01	3.66E+01	8.73E-03	8.73E-03	8.73E-03
107062	Ethylene dichloride	2.38E+01	1.38E+01	1.44E+01	3.45E-03	3.45E-03	3.45E-03
50000	Formaldehyde	6.31E+01	3.66E+01	3.83E+01	9.15E-03	9.15E-03	9.15E-03
35822469	1,2,3,4,6,7,8-HpCDD	9.63E-06	5.58E-06	5.85E-06	1.40E-09	1.40E-09	1.40E-09
67562394	1,2,3,4,6,7,8-HpCDF	4.67E-06	2.71E-06	2.84E-06	6.77E-10	6.77E-10	6.77E-10
55673897	1,2,3,4,7,8,9-HpCDF	1.20E-06	6.98E-07	7.31E-07	1.75E-10	1.75E-10	1.75E-10
39227286	1,2,3,4,7,8-HxCDD	2.69E-06	1.56E-06	1.63E-06	3.90E-10	3.90E-10	3.90E-10

Citizen's Report on Cement Plant Regulation in the
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Gary Latshaw, Ph.D. May 20, 2012
Gary Latshaw, Ph.D.
Appendix E – Table from Florida Department of Environmental Protection

The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. In developing their regulations, the report summarized regulations at other cement plants within the United States. Although the report was prior to the EPA NESHAPs Regulation in 2010, half the plants had SO_2 ratios of 0.2 lb/ton and all but a couple had NOx ratios of less than 2.0 lb/ton. The WS report has no regulation proposed for SO_2 (2010 actuals were 1.15 lb/ton) – almost ten times the regulation of these plants. The WS report regulates NOx at 2.3 lb/ton, which although this is an improvement over 2010 actual ratios, is still above the ratio for the majority of these other plants.

Table 10. Emission Limits for in Recent Cement Plant Permits in lb/ton of Clinker.

Project	NO_X (lb/ton)	SO_2 (lb/ton)	CO (lb/ton)	VOC (lb/ton)	PM_{10} (lb/ton)	Total[a] (lb/ton)
CEMEX Brooksville (Application)	1.95	0.20	2.9	0.12	0.23	2.50
CEMEX Brooksville (Draft BACT)	1.50	0.20	2.0	0.115	0.15	1.97
Drake Cement LLC. AZ	1.14/1.95	0.06	3.6	0.12	0.21	1.53
Ash Grove/Moapa. NV (Draft BACT)	1.95	0.42	1.05	0.0625	0.095	2.53
Sumter Cement. Center Hill	1.95	0.20	2.9	0.115	0.15	2.42
American Cement. Sumterville	1.95	0.20	2.9	0.12	0.15	2.42
Suwannee American. Branford Kiln 2	1.95	0.20	2.9	0.12	0.17	2.44
Florida Rock. Newberry Kiln 2	1.95	0.28	3.6	0.12	0.28	2.63
Rinker/FCS. Brooksville Kiln 2	1.95	0.23	3.6	0.12	0.20	2.50
Holcim Lee. Missouri (2004)[d]	2.4/1.6	1.26	6.0	0.33	0.35	4.34
CEMEX Brooksville Kiln 2 (rev. 2007)[b]	2.0	0.20	2.0	0.115	0.15	2.47
Titan Florida Medley (1999. rev. 2006)[c]	2.17	0.50	2.0	0.14	0.10	2.91

Robert Cave

From: Rod Sinks <rodsinks@gmail.com>
Sent: Tuesday, May 22, 2012 10:58 AM
To: Robert Cave
Cc: Dan Belik; Henry Hilken
Subject: Re: Your comments from yesterday's Board of Directors meeting

Hi Robert,

Just arrived in Sacramento on a SVLG lobbying trip.

Here are my remarks from yesterday. I had to abbreviate them when I spoke from 3 minutes to 2. I would appreciate your forwarding them to the clerk of the board to be incorporated as part of the record of the meeting.

Regards,

Rod

BAAQMD Board Meeting
Quinlan Center, Cupertino
May 21, 2012

I'm Rod Sinks and am a city council member from Cupertino but am here speaking as an individual rather than as a representative of the city.

Welcome to Cupertino and this key part of Silicon Valley, where we take pride in having built a major economic engine for the world, based largely on attracting the best minds from around the world. We need to keep Silicon Valley residents' minds and lungs healthy to stay competitive.

As you go through the process of determining what regulations to apply to the cement plant upwind of Silicon Valley, note that the City Councils of Cupertino and Los Altos Hills have both weighed in, asking you to consider more stringent regulation than the draft prepared by Air Board staff, and you do have the power to do so.

This plant is special because of its size and location next to an urban area. I note there are 9 other cement plants in the state; cement makes up only 10% of finished concrete, and as it was transported from here to build Shasta Dam, that 10% component can also be brought in

from the other 9 plants in the state, 90% is aggregate supplied locally that does not go through a kiln. Interestingly, Lehigh has recently been importing higher quality limestone from British Columbia to burn in the local facility.

I ask you to review Dr. Latshaw's report and help all of us by asking staff to prepare and publish answers to the following questions:

1) Is Dr. Latshaw's analysis accurate? If not, can staff refine or correct it so we all have an accurate assessment of health costs under various scenarios?

2) Who should be paying the large health care cost?

3) If the numbers are right, the draft standard seems to bring down costs a very minor fraction - from $620 mil to $570 mil. Why is the PM 2.5 requirement more lenient than current actuals?

4) If SO2 emissions are such a significant component of health cost, why does the draft not regulate it?

5) Why not require state-of-the-art control using maximum feasible technology and get the cost down to $100 mil?

6) If Lehigh or the Air Board staff claim costs are too high to use maximum feasible technology and meet aggressive standards, what are the financials, specifically, what are the capital costs and how much would the price of cement rise in the Bay Area with the Air Board's proposal and with additional measures toward max feasible technology?

7) Can and will the Air Board staff quantify the health effects of heavy metal pollutants, particularly Mercury and Chromium, as Dr. Latshaw has done for other pollutants?

Our health is in your hands and we think publishing answers to these questions and letting the public weigh in is the responsible thing for this board to do prior to making a decision.

Please come back to Cupertino for your September public hearing.

Thank you very much for your attention and action.

Sent from my iPad

On May 22, 2012, at 10:30 AM, Robert Cave <RCave@baaqmd.gov> wrote:

> Hello Mr. Sinks,
>
> It was nice to speak with you again in Lehigh's parking lot.
>
> You gave comments yesterday, listing about 6 questions for the District related to Dr. Latshaw's submittal.
>
> If you have a copy of your remarks written down, could you please forward them to me?
>
> Thanks,
>
> Robert Cave
> Senior Air Quality Specialist
> Rules and Research Division
> Bay Area Air Quality Management District
> rcave@baaqmd.gov
> (415) 749-5048

MISSING FACTS IN LEHIGH FACT SHEET

Page 1, No mention that Lehigh is the largest source of NOX without modern NOX controls. (Reference BAAQMD Workshop Report November 2011: Robert Cave)

Page 3, No mention that the permitting of Gypsum Feeders was forced by a NOV issued stating the Feeders were operating without a Permit. (Reference same)

Page 4, No mention that EPA has not approved District's PSD regulations. (Reference minutes of Stationary Source Committee meeting January 9, 2012)

Page 5, No mention that AERMOD model used in HRA was flawed. (Reference BAAQMD Workshop Report November 2011, Page 17 Robert Cave)

Page 6, No mention made that Lehigh currently does not meet ground level Ozone requirements. (Reference Staff comment made at December 11, 2012 Workshop)

Page 6, No mention made of historic forthcoming PM 2.5 Offset program that will impact public commuting with Lehigh's 100,000 diesel truck trips per year a major source of PM2.5. (Reference statement of record by Messrs. Crockett& Broadbent at Stationary Source Committee meeting January 9, 2012)

Page 7, No mention made that forthcoming OEEHA revisions for Exposure Assessment and Stochastic Analysis will likely show an increase in public health risk from TACs emitted by the Lehigh Cement Plant. (Reference OEHHA draft document Air Toxics Hot Spots Program)

Page 8, No mention made of Letter from the Town of Los Altos Hills to BAAQMD asking for tighter regulation of the Lehigh Cement Plant. (Reference LAH letter dated February 17, 2012 to Jack Broadbent)

Page 8, No mention made that Lehigh is the prime emitter of GHG in Santa Clara County (4 million tons/day) now treated as a pollutant by EPA. (Reference BAAQMD Workshop Report November 2011: Robert Cave)

These comments were previously made to the BAAQMD Stationary Source Committee at their meeting on March 19, 2012. Mr. Broadbent told the Committee they were not correct.

Loma Prieta Chapter of the Sierra Club
3921 E Bayshore Rd. Suite #204
Palo Alto, CA 94303
loma.prieta.chapter@sierraclub.org

9 July 2012

Ms. Kristina Chu
Public Information Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Reference: Proposed Portland Cement Plant Regulation 9, Rule 13, posted 11/18/2011

Dear Ms. Chu:

I am writing on behalf of the Sierra Club Loma Prieta Chapter's Air Quality Committee. Since writing to you on February 15, 2012, more information about the implications of the draft Portland Cement Plant regulations, as they would apply to the Lehigh Southwest Cement facility, has surfaced. The purpose of this letter is to apprise BAAQMD of this information. Also, a report is included that provides details on the health costs of Lehigh's emissions under various pollution control alternatives.

Our updated comments are:

1. **Why is it that the draft regulation for PM is 0.04 lb/ton of clinker is substantially above the value of 0.014 lb/ton of clinker obtained in 2010?** According to the BAAQMD Workshop Report dated November 2011, the Lehigh facility currently achieves a PM emission rate of 0.014 lb/ton of clinker – nearly meeting the recommended limit. The draft regulation proposes a PM emission rate almost three times that rate. This would be the equivalent of increasing the speed limit on highways from 65 mph to over 200 mph while hoping that motorists would still drive at the safer speed of 65 mph. It is incomprehensible why the agency would allow so much more PM emissions than Lehigh is already releasing. This is further confusing as the agency promotes at significant costs restricting the use of fireplaces because of PM pollution.

2. **Why is it that the proposed regulation does NOT include SO_2 regulation?** Although the Lehigh plant emitted 1.15 lb of SO_2/ton of clinker in 2010, the proposed regulations do not even cap emissions at this already achieved level. Your Clean Air Plan 2010 assigns a health cost benefit of $37,900/ton of SO_2 removed, which is the highest ratio for any conventional pollutant. In a report by the Department of Environmental Protection in Florida (DEP File No. 0530010-029-AC) seven Portland cement plants in the United States are reported to have an SO_2 emission limit of 0.2 lb/ton of clinker. In addition, the attached report

documents that there are many options to cost-effectively reduce SO_2. Because SO_2 is a significant source of respirable particulate matter, why isn't the agency doing more to regulate this pollutant?

3. **Why is it that the regulation for NOx is 2.3 lb/ton of clinker and not the more protective regulation of 1.5 lb/ton of clinker, which the EPA stipulates in the NSPS regulations.** The draft NOx emission limit of 2.3 lb/ton of clinker will apparently require the installation of SNCR. However, the Florida report sited above states a high-efficiency SNCR installation in Germany achieves emissions of 0.9 lb/ton of clinker. That report (page 32) also provides metrics to assess the cost of achieving these rates. Using these metrics against the Lehigh production of 1.6 million tons of clinker/year, we calculate that the cost of a SNCR system is about 2 million dollars. This cost is consistent with the BAAQMD's workshop report on page 19. Given that an SNCR is capable of reducing emissions to 0.9 lb/ton of clinker, we feel a lower emission level of NOx is appropriate.

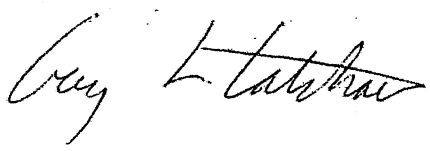
4. **Emissions from Lehigh should be regulated to the same extent as other facilities.** As cited several times above, and in the attached report, there are well-established, cost-effective pollution control techniques to provide more protection for the public. These techniques have been required by other agencies to regulate SO_2 emission levels to 0.2 lb/ton. Given the estimated health costs caused by emissions from the plant – 600 million dollars over 10 years – we believe it is the agency's responsibility to require these same techniques. If for some reason these other techniques would not work at the Lehigh facility, a clear and detailed explanation should be provided to the public.

We are attaching a report that describes the health costs associated with Lehigh's air pollution emissions using the methodology of BAAQMD's Clean Air Plan 2010. It is our view, in light of this analysis, that limiting Lehigh's emissions to the values shown in the column "potentially achievable" in the table below, or at the very least the EPA's NSPS limits, will allow Lehigh to continue to operate while providing much more protection to the public health.

Pollutant	2010 Actuals	Draft Workshop	EPA NSPS	Potentially Achievable
SO2	1.15	None*	0.40	0.115
NOx	4.00	2.300	1.50	0.80
PM	0.014	0.04	0.01	0.01

The goal of these recommendations to ensure and improve public health, a goal that both Sierra Club and BAAQMD share. By adopting the stricter standards, BAAQMD will achieve this common goal. The costs of achieving the more restrictive regulations are very modest.

Thank you for the opportunity to comment on the proposed rules. We hope that you agree with us that the cement produced at this facility should only be produced in a way that does not degrade the health of our community.



Gary Latshaw, Ph.D.
Chairman of the Air Quality Committee
Loma Prieta Chapter of the Sierra Club
Contact: glatshaw@gmail.com
cc: Robert Cave, BAAQMD

Robert Cave

From: Barbara Kelsey <loma.prieta.chapter@sierraclub.org>
Sent: Monday, July 09, 2012 1:58 PM
To: Kristina Chu; Robert Cave
Cc: 'Gary Latshaw'; MichaelJFerreira@gmail.com
Subject: Sierra Club Letter to the Bay Area Air Quality Management District
Attachments: letter to BAAQMD as sent 7 9 2012.pdf; sierra club report on lehigh as sent 7 9 2012.pdf

Dear Ms Chu and Mr Cave,

Please find attached a letter (and back up exhibit document) from our Air Quality Committee regarding more information about the implications of the draft Portland Cement plant regulations. The purpose of this letter is to apprise BAAQMD of this information. Also, a report is included that provides details on the health costs of Lehigh's emissions under various pollution control alternatives.

Best regards,

Barbara Kelsey
Chapter Coordinator
Sierra Club, Loma Prieta Chapter
3921 E. Bayshore Rd, Suite 204
Palo Alto, CA 94303
ph 650-390-8411
fax 650-390-8497

Loma Prieta Chapter of the Sierra Club
3921 E Bayshore Rd. Suite #204
Palo Alto, CA 94303
loma.prieta.chapter@sierraclub.org

Assessment of Cement Plant Regulation in the San Francisco Bay Area

Air Quality Committee of the
Loma Prieta Chapter of the Sierra Club

Gary Latshaw, Ph.D.
(glatshaw@gmail.com)

9 July 2012

This is an analysis of the health implications of the air pollution from the Lehigh Cement Plant using alternative emission scenarios. The analysis is based on documents from Bay Area Air Quality Management District (BAAQMD) and the Environmental Protection Agency (EPA). The primary results are summarized in the graph below. A period of 10-years was adopted since a capital expenditure to achieve these levels would last 10 years or longer.

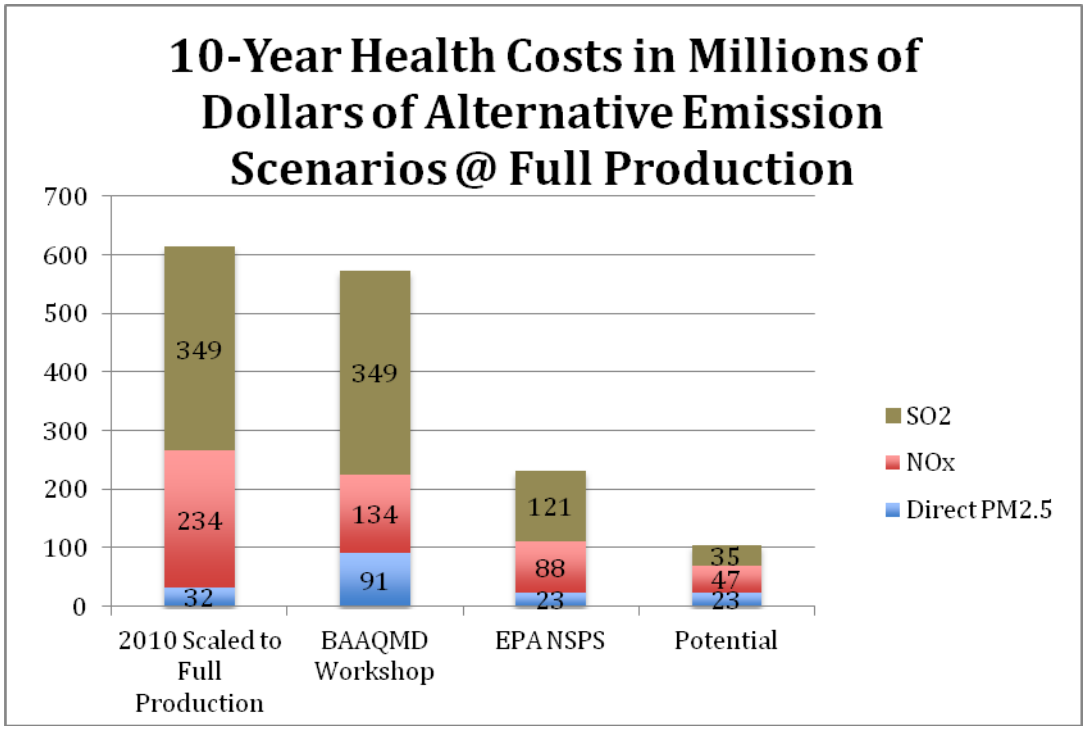


Figure 1 – 10-Year Health Costs (or Benefit of Removing Pollutants) All calculations presume full production of 1,600,000 tons of clinker.

As seen in the graph:

- The proposed regulations in the BAAQMD Workshop (WS) result in only minimal improvement (reduction) in 10-year health costs (41 million dollars) relative to actual 2010 emission ratios.
- The EPA NSPS regulations would result in much greater improvement (reduction) to health costs (384 million dollars).
- Moreover, there are technologies that have not been fully investigated by BAAQMD that could potentially provide even greater health savings (511 million dollars)
- The assignment of health costs to the emissions is based on the methodology in BAAQMD's Clean Air Plan 2010 (CAP). The use of the term "health costs" in this analysis is synonymous to the CAP's terminology "$$Benefit of Reducing".

- It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA NSPS regulation of 21 lb/ton-clinker. These health impacts do not include the effects of mercury, chromium VI, and other toxins.

While the state-of-the-art in assigning health implications vs. emission levels is only approximate, we believe it is accurate to state that the costs over 10 years are many hundreds of millions of dollars while the equipment to reduce them substantially have costs in the tens of millions of dollars. The WS regulations have these specific deficiencies:

1. **Why is it that the draft regulation for PM is 0.04 lb/ton of clinker is substantially above the value of 0.014 lb/ton of clinker obtained in 2010?**
   According to the BAAQMD Workshop Report dated November 2011, the Lehigh facility currently achieves a PM emission rate of 0.014 lb/ton of clinker-nearly meeting the recommended limit. The draft regulation proposes a PM emission rate almost three times that rate. This would be the equivalent of increasing the speed limit on highways from 65 mph to over 200 mph while hoping that motorists would still drive at the safer speed of 65 mph. It is incomprehensible why the agency would allow so much more PM emissions than Lehigh is already releasing. This is further confusing as the agency promotes at significant costs restricting the use of fireplaces because of PM pollution.

2. **Why is it that proposed regulation does NOT include SO_2 regulation?** Although the plant emitted 1.15 lb/ton of clinker in 2010, the proposed regulations do not even cap the emissions at this already achieved level. Your own report (Clean Air Plan 2010) assigns the benefit of reducing SO_2 at $37,900, which is the highest ratio for any gas chemical! This is not to say the regulation should be as high as 1.15 lb/ton as the EPA stipulates 0.4 lb/ton of clinker in the NSPS regulation. Also in the report by the Department of Environmental Protection in Florida (DEP File No. 0530010-029-AC) seven plants in the United States are shown to be regulated to the protective value of 0.2 lb/ton of clinker. There are many options to inexpensively reduce SO_2. Again, since the primary health effects of SO_2 is to form particulates, which you are attempting to control via your program to restrict the use of fireplaces, you appear to be undermining your own goals in this matter.

3. **Why is it that the regulation for NOx is 2.3 lb/ton of clinker and not the more protective regulation of 1.5 lb/ton of clinker, which the EPA stipulates the NSPS regulations.** The draft NOx emission limit of 2.3 lb/ton of clinker will apparently require the installation of SNCR. However, the Florida report sited above states a high-efficiency SNCR installation in Germany achieves emissions of 0.9 lb/ton of clinker. The report (page 32) also provides metrics to assess the cost of achieving these rates. Using these metrics against the Lehigh production of 1.6 million tons of clinker/year, we calculate that the cost of a SNCR system is about 2 million dollars. This cost is consistent with the BAAQMD's workshop report on page 19. Given that

an SNCR is capable of reducing emissions to 0.9 lb/ton of clinker, we feel a lower emission level of NOx is appropriate.

4. **Why is it that other cement plants have more protective regulations than the proposed?** As sited several times above, and there are well-established, inexpensive techniques to provide more protection for the public. These techniques have allowed other agencies to regulate SO_2 emission levels to 0.2 lb/ton of clinker. Given the high-health costs currently resulting from the emissions from the Lehigh plant – 600 million dollars over 10 years, we believe it is the agency's responsibility to require these same techniques. If for some reason these other techniques would not work at the Lehigh facility, a clear and detailed explanation should be provided to the public.

   The analysis in developing the WS regulations did not seriously consider emission reduction ratios achieved by other plants such the Holcim Siggenthal PH kiln in Switzerland, and other plants in the United States (see Appendix E and Removal Techniques section). The WS draft suggests emission reduction from the plant using a Selective Non-Catalytic Reduction (SNCR). However, there are other technologies that could be employed in addition such as Selective Catalytic Reduction (SCR), use of alternative fuels, Coke filters, and others.

Certainly the more protective emission regulations will require capital and maintenance costs on the part of Lehigh, but the health benefits over 10-years are about half a billion dollars! The recommended regulation for Cement Plants that was specified in the BAAQMD Workshop (WS) does not provide sufficient health protection for Bay Area Residents. These health impacts are most likely understated since they don't include the effects of mercury, chromium VI, and other toxins. It is worth noting that Lehigh would emit substantial amounts of mercury. According the WS information: 55lb/ton-clinker with WS regulation, which, although less than the 2010 actual of 305 lb/ton, is not as protective as the EPA NSPS Plants of 21 lb/ton-clinker.

The Federal Register in describing the NSPS regulations specifies proven technologies that have reduced emissions even more than those regulations. US Public Health Code 42 USC 7416 allows local government agencies to impose stricter regulations than the EPA regulation. In particular, since the Bay Area is already a non-attainment region regarding air quality, and the Lehigh Plant is unique in California for being adjacent to a large metropolitan area, <u>we feel it is appropriate to regulate to the most technologically achievable emissions</u>. Those technologies are apparently capable of removing almost all the emissions. As we explain in the section "Removal Techniques," We surmised after evaluating these materials that the regulations could be placed at on 10% of the SO_2 2010 emission ratios and at 20% of the NOx 2010 emission ratios. The Florida Division of Air Regulation (FLTE) did an analysis that provides evidence (see Appendix E) of actual regulations at many plants near my suggested SO_2 level in 2007.

Residents of the entire Bay Area would receive the health benefits from more protective regulations. While the residents near the plant have been the most vociferous in their requests for more protective measures, the health benefits will come to the entire

community. The 500 million dollar savings due to reduced emissions would far exceed the capital equipment and maintenance costs that Lehigh would incur.

The health benefits from the more protective regulations are, because of the limited information available, understated from what would likely be achieved. The CAP only treated ten pollutants (excluding CO2), and the emissions from the plant were only available for nine of those pollutants. This results in not treating the health costs from mercury, chromium VI, ammonia, and other pollutants with known health effects. The proposed regulations depart from BAAQMD's recommended regulations in the treatment of SO_2, NOx, and particulates (PM).

CO_2 was not included in this analysis since although the effects of CO_2 on climate change and health effects are real and significant, the CO_2 emissions will occur either locally or somewhere else to produce the needed cement.

Diesel Truck Emissions

Also, neither this analysis nor the BAAQMD's analysis considers the impacts of the diesel truck traffic on the residents who live near the segments of Steven's Creek Blvd and Foothill Expressway where most of the truck traffic travels. In recent years, it has become evident to scientists that diesel exhaust has significant health effects to those who live near major diesel traffic routes.

Analysis

The subsequent tables (1-4) provide detailed the health impacts by each pollutant from the Lehigh Cement Plant for different scenarios. Colors are used in the tables to indicate the source of information. Appendix A is a reference where all the sources are identified. An emission ratio is the amount of a pollutant emitted (in pounds) per ton of clinker produced. Clinker is the primary intermediate product of cement production. These tables assume the licensed production of 1,600,000 tons of clinker. The tables present the results for the primary pollutants: SO_2, NOx, and PM 2.5, which were described in Figure 1 along with minor contributions from other pollutants. The other pollutants are reactive organics (ROG), benzene, diesel PM2.5, 1,3-butadiene, acetaldehyde, formaldehyde, and ammonia. Appendix C shows the health impact factors (red) that have been used from the CAP.

In developing the health impact costs, emission ratios of ROG, Benzene, Diesel PM 2.5, 1,3-Butadien, Formaldehyde, and Ammonia were calculated using the emission values in the "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix". This report was produced by the consulting firm of AMEC Geomatrix under contract to Lehigh. In particular, Table ES-2 (see Appendix D), was used to develop the emission ratios based on a low production of 847,000 tons of clinker in 2010. The emission ratios are displayed with a brown background. The values are much smaller than the top three pollutants.

The tables represent annual health costs, but decisions on "health costs" vs. "reduction equipment and maintenance costs" should consider a 10-year period since most of the costs for reduction are capital equipment costs, which would be amortized over 10-years or even longer. Note that over 99% of the health impact is due to NOx, SO_2, and PM emissions. Table 5 summarizes the emission ratios used throughout.

Table 1 – BAAQMD Recommendations in Workshop Report (November 2011) based on EPA "Existing" Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	1.150	920.00	$34,868,000	WS page 6 -2010 actuals
NOx	$7,300	2.300	1,840.00	$13,432,000	WS page 15
Direct PM2.5[2]	$456,400	0.014	19.84	$9,054,976	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$57,500,130	

[1]SO2 is not proposed to be regulated in this case. Actual emission ratios based on the WS report were used.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

Table 2 assumes the plant operates with the EPA NSPA regulations for Plants and is operating at full licensed capacity. The table shows 57.5 million dollars in annual health costs.

Table 2 EPA NSPS Plants

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2[1]	$37,900	0.40	320.00	$12,128,000	WS page 7
NOx	$7,300	1.500	1,200.00	$8,760,000	WS page 7
Direct PM2.5[2]	$456,400	0.01	4.96	$2,263,744	WS page 7
ROG	$4,800	2.550E-02	20.40	$97,920	assume 2010 WS actuals
Benzene	7,200	6.919E-03	5.53	$39,851	assume 2010 HRA actuals
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	assume 2010 HRA actuals
1,3-Butadiene	$25,400	6.588E-05	0.05	$1,339	assume 2010 HRA actuals
Acetaldehyde	$500	8.300E-04	0.66	$332	assume 2010 HRA actuals
Formaldehyde	$1,100	4.522E-05	0.04	$40	assume 2010 HRA actuals
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$23,296,898	

[1]SO2 is now assumed to be regulated.

[2]The Direct PM 2.5 ratio is the product of the PM/clinker-ton times 62%. 62% is from the ARB and cannot necessarily assigned to this plant.

Table 3 assumes that the plant is operating at licensed production levels of 1,600,000 tons of clinker. The emission ratios for SO_2 are 10% of 2010 actuals and NOx are 20% of 2010 actuals based on what has been achieved elsewhere. The PM ratio is directly from the EPA's NSPS regulation and it is unchanged from Table 2.

Table 3: Technologically Achievable

Pollutant	$Costs/yr-ton	avg lb/ton clinker	tons/year	Cost /yr	Notes on Emission Ratios
SO2	$37,900	0.115	92.00	$3,486,800	WS: page 6
NOx	$7,300	0.80	640.00	$4,672,000	WS: page 6
Direct PM2.5	$456,400	0.01	4.96	$2,263,744	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$10,567,698	

Table 4 is provided for comparison to these alternative regulations as it represents the actual emission ratios (from WS: page 6) and then presumes full licensed production of 1,600,000 tons of clinker.

Table 4 -2010 actual ratios @ 1,600,00 tons Production

Pollutant	$Benefit/yr-ton	avg lb/ton clinker	tons/year	Cost/yr	Notes on Emission Ratios
SO2	$37,900	1.150E+00	920.00	$34,868,000	WS: page 6
NOx	$7,300	4.000E+00	3,200.00	$23,360,000	WS: page 6
Direct PM2.5	$456,400	8.680E-03	6.94	$3,169,242	WS: page 6*
ROG	$4,800	2.550E-02	20.40	$97,920	WS: page 6
Benzene	7,200	6.919E-03	5.53	$39,851	WS: page 6
Diesel PM2.5	$459,300	constant: 24.7 lb/yr	0.01235	$5,672	HRA Table E-2
1,3-Butadien	$25,400	6.588E-05	0.05	$1,339	HRA Table E-2
Acetaldehyde	$500	8.300E-04	0.66	$332	HRA Table E-2
Formaldehyde	$1,100	4.522E-05	0.04	$40	HRA Table E-2
Ammonia	$53,500		0.00	$0	
CO2 equivalent	$28			N/A	
				$61,542,395	

Table 5 shows the emission ratios used in creating the health costs. These emission ratios were multiplied by the licensed production of clinker (1,600,000 tons/yr). With the exception of "Potentially Achievable", the ratios in this table are from the WS. The "Potentially Achievable" levels are our estimate based on reading the literature.

Table 5 Alternative Regulations (Pounds of Pollutant/ton of clinker)

Pollutant	2010 Actuals	Draft Workshop	EPA NSPS	Potentially Achievable
SO2	1.15	None*	0.40	0.115
NOx	4.00	2.300	1.50	0.80
PM	0.014	0.04	0.01	0.01

Since no regulation of SO_2 was proposed, this analysis assumed that the 1.15 actual for 2010. The health impacts from these three pollutants represent 99% of the total impact.

Removal Techniques

The rationale for recommending more protective measures for SO_2, NOx, and particulates (PM) than the WS recommended is presented subsequently. The following analysis argues that more protective techniques are available to reduce the emissions to even less than the EPA's NSPS regulation

SO_2

This analysis reveals that there is the potential to regulate Lehigh at a SO2 production ratio of 0.115 lb/ton or perhaps even more protective. At this production ratio, health benefits associated with SO_2 reduction of 314 million dollars would accrue over 10 years (relative to 2010). The 2010 actual ratio was 1.15 lb/ton. The WS has no regulation for SO_2 stipulated. The EPA NSPS regulation is 0.4 lb/ton of clinker.

As stated the WS does not specify any regulation on SO_2. The WS (page 17) states that: "Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh may trigger an exceedance of the new ambient standard; however, these modeling results do not correlate well with local monitoring data." The WS goes on to argue that the complex terrain makes these modeling results suspect. However, what is not discussed is that the majority of the monitoring is at a site that is close to trees and usually not downwind of the plant. These trees will remove pollutants from the atmosphere and the hills will divert most of the pollutants away from the monitoring station.

SO_2 is an extremely potent pollutant with a very high health benefit of removal – hundreds of millions of dollars over 10 years. In addition to the chemical having harmful health effects, it is also a precursor to the development of fine particulate (PM2.5) in the atmosphere, According to the FAR (page 54984): "Reducing SO2 emissions also reduces PM2.5 formation, human exposure, and the incidence of PM2.5-related health effects, among them premature mortality and cardiovascular and respiratory morbidity."

The EPA's NSPS a regulation for SO_2 emissions is 0.4 lb/ton of clinker. According to the table on page 6 of WS, Lehigh emitted 1.15 lb/ton of clinker of SO_2 in 2010. The report indicates in several places that measures to reduce the production of other pollutants should also lower SO_2 levels. We feel it is only reasonable to specify a regulation. It is noteworthy that Lehigh emitted 181 tons of SO_2 in 2008 (page 3 of WS). If production levels in 2008, which were not specified, were similar to 2010, then in 2008 the ratio of SO_2/ton of clinker would be 0.2 lb/ton of clinker – an emission ratio less than the proposed regulation.

The referenced statements below provide evidence that 90% of the SO_2 emissions (relative to 2010) can be removed. A removal efficiency of 90% relative to 2010 actuals would provide an emissions ratio of 0.115 lb/ton of clinker.

However, the 2010 production of SO_2 is 1.15 lb/ton, which has been reduced from completely unregulated probably due to the injection of lime in the kiln. Starting at an already reduced level may not allow the post-processing methods to extract 90% of the remaining.

- Appendix A of the CAP (page A-26) states that retrofitting an SO_2 scrubber into the flue gas train would remove 90% of the SO_2.

- The WS identifies in some detail the way a SO_2 can be controlled by scrubbing, but then never suggests any regulation of SO_2. On page 14 of the WS:

    - "Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser extent metal and ammonia emissions. This is the most commonly used method of desulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased CO_2 emissions, increased water consumption and risk of water contamination, and increased operational costs."

- The FAR has several examples of very high efficiencies in removing SO_2. Quoting the FAR in several places:

    - "We also note that SO_2 scrubbers in the utility industry have consistently achieved 90 percent SO_2 since the 1970s. We see no technical reason that the same removal levels are not achievable in the cement industry." (page 55019)

    - "State commenters (60) and (72) state that the Ash Grove Chanute PH/C kiln in Kansas achieves less than 0.30 lb SO2/ton despite high sulfur in the raw materials without even using a wet scrubber. State commenter (60) states that this performance is attained using important innovations (The F.L. Smidth DeSOx system and Envirocare Micromist Lime system) not yet assessed by EPA. Attachments provided as part of the comment describe these technologies. State commenter (60) states that without controls, the proposed Chanute kiln would emit SO2 at the high rate of 12 lb/ton from raw material sources alone (*i.e.,* exclusive of fuel SO2). According to state commenter (60), using the described technology, actual

emissions from the Ash Grove Chanute kiln are less than 0.25 lb SO_2/ ton." (page 55016)[Note: The reduction at Ash Grove from an unregulated production of 12 lb/ton to 0.25 lb/ton represents a 98% removal efficiency.]

- "According to State commenter (60), the Holcim Siggenthal PH kiln in Switzerland achieves approximately 0.05 lb SO2/ton using the POLVITEC coke filter installed in the 1990's. The POLVITEC system is used with various concurrent operational practices to control NH_3 (from an SNCR system), SO2, PM and metals. Among several functions, the coke filter captures the non-fuel SO2 generated in the PH. The coke is subsequently crushed and then burned with fuel in the main kiln burner. The SO2 from the PH then behaves like fuel SO_2 and is incorporated into the clinker. Further details are available in an attachment submitted with the comment. The State commenter also states that SO_2 emissions would be significantly less than 0.10 lb/ton of clinker. According to the State commenter, the Siggenthal plant emits much less SO_2 than the average of Holcim cement plants in Switzerland and clearly less than 0.10 lb SO_2/ton." (page 55016)

- "State commenter (60) states that good SO2 control will make it possible to employ more aggressive NO_X control and that the control of NO_X and SO2 will also minimize the formation of ozone and fine PM in the environment. State commenters (68, 70, 71) stated that State and local experts, who have had long experience with this industry, believe that the proposed NSPS limit for SO2 does not reflect what most plants are capable of achieving." (page 55016) [Note: NSPS refers to an emission ratio of 0.4 lb/ton.]

A report by the engineering firm Sargent & Lundy LLC entitled "Economics of Lime and Limestone for Control of Sulfur Dioxide", sites several methods of controlling SO_2 emissions. Although the report focuses on power plants, the engineering problems associated with SO_2 removal in the effluent from cement plants is the same as power plants. There report consistently sites very high – in excess of 90% - removal rates of SO_2. Such removal rates make the recommended emission rates easily achievable at moderate costs.

NOx

This analysis reveals that it is reasonable to regulate Lehigh at a NOx production ratio of 0.8 lb/ton (This represents an 80% reduction over 2010). At this production ratio, health benefits of 187.0 million dollars would accrue over 10 years (relative to 2010). The 2010 actuals were 4.0 lb/ton. The WS has suggested 2.3 lb/ton. The EPA NSPS level is 1.5 lb/ton.

NOx is a major contributor to the formation of ozone, which is an established pollutant causing both ill health and eye irritation. Although the health benefit in reducing Nox is less than that for SO_2, there are substantial health benefits in regulating it to the maximum feasible level. Reducing the SO_2 emissions will aid in the removal of Nox.

Nox has two distinct sources in the production of clinker:

- Since nitrogen N_2 is a major component of air (80%), the high temperatures reached in the kiln cause N_2 to oxidize and form various nitrous oxides (Nox).
- Nitrogen compounds are frequently found in input materials and therefore contribute to the formation of Nox during the combustion process.

The referenced documents below provide ample evidence that 80% of these emissions (relative to 2010) can be removed. A removal efficiency of 80% relative to 2010 actuals would provide an emissions ratio of 0.8 lb/ton of clinker. Quotes are from the FAR.

- Selection of the fuel can greatly effect the production of NOx.
    - More volatile fuels burn more efficiently at a lower temperature and produce lower NOx during combustion.
    - Nitrogen in the combustion material will contribute to increased emissions. “Typically, fuel nitrogen in coals used by PH/PC kilns varies between 1.0 and 2.0 percent. This difference can impact the uncontrolled NOX by as much as 1.5 lb/ ton of clinker.” (page 55014)
    - Given the above advantages of a low-volatile, low-nitrogen fuel, consideration should be made of returning to the use of natural gas, whose price has come down recently.

- “The results from the existing Radici Cementeria di Monselice PH kiln where emission reductions to values as low as 0.20 lb NOX/ton were demonstrated by installation of a SCR system. The supplier guaranteed reduction of 90 percent and realized reductions as high as 97 percent.” (page 55010)

- “The commenter states that with the improved processes that lower uncontrolled NOX emissions and with the addition of SCR, NOX limits of 0.25–0.5 lb NOX/ton clinker are achievable.” (page 55010 and 55011)

- "State commenter 60 states that based on the foregoing, reductions on the order of 75 percent are achieved by well-designed SNCR systems and 90 percent by SCR." (page 55010) [Note: Our report is recommending only a 80% reduction.]

- The FLTE provides metrics (page 32) to assess the cost of achieving an emission rate of 0.9. lb/ton of clinker. Using these metrics against the Lehigh production of 1.6 million tons of clinker/year, we calculate that the cost of a SNCR system is about 2 million dollars. This is consistent with the BAAQMD WS. Two million dollars will save hundreds of millions in health costs.

The high levels of emission removal were achieved by using two complementary technologies: Selective Catalytic Removal (SCR) and Selective Non-Catalytic Removal (SNCR). The WS discusses the two technologies, but requests only the SNCR be implemented. Even more reduction is probably available thorough the use of POLVITEC coke filter installed in the 1990's in Switzerland.

Particulates

This analysis adopts a PM emission ratio of 0.01 lb/ton. At this production rate, a 10-year savings in health costs of 90.6 million dollars would accrue. This ratio was adopted from the EPA's NSPS regulation. That ratio was based on the use of existing fabric and membrane technologies (page 54995 of the FAR). The 2010 production ratio was 0.014 lb/ton or only 40% greater than this recommendation. The WS specified a production ratio of 0.04 lb/ton – this is a ratio, which is more relaxed than the 2010 actuals.

The health impact of particulates is primarily due to the fine particulate component – particulates smaller than 2.5 um. There are no known measurements of the PM 2.5 fraction from Lehigh. In doing the calculations, it was assumed that the ratio of PM 2.5/PM was 62% - a figure from the California Air Resource Board that may not reflect the conditions at Lehigh.

Monitoring

The monitoring of the emissions from the plant must be upgraded as follows:

- All emissions should be released from a single stack.
- Continuous Monitoring of the gases must be adopted to quickly detect faulty equipment. Also, ammonia emissions must be monitored. The removal mechanisms for NOx can result in an inadvertent release of ammonia, which is not a problem at this time, so monitoring is essential in the future.
- Continuous Monitoring of particulate emissions must be adopted to quickly detect faulty equipment – in particular rips in the filter bags

Ambient Air Monitoring

BAAQMD has had a monitoring station located at Monta Vista Park for over one year. The measurements from this station are sometimes cited as indicative of the impact of Lehigh Cement emissions. Three meteorologist have been consulted in evaluating this assertion. However, because the Monta Vista Park site is nominally not downwind of the effluent stacks and the monitoring inlets are below and near trees, which can scrub the air of some pollutants, these measurements cannot be considered an indicator of emissions from the plant. A more suitable location for the monitoring station is just north of Permanente Road and to the west of the railroad tracks.

(CAP) Clean Air Plan Voume 1, BAAQMD, Adopted Sept 15, 2010 by ABAG, MTC, BCDC http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20I%20%20Appendices.ashx http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Plans/2010%20Clean%20Air%20Plan/CAP%20Volume%20II_Sections%20A-F.ashx
AMEC Report: "Revised AB 2588 Health Risk Assessment 2005, Average 2008/2009, and 2013 Production Scenarios" (Lehigh/ AMEC Report) prepared by AMEC Geomatrix Note: This report was provided on a DVD by BAAQMD
(WS) Workshop Report by Robert Cave," BAAQMD Reg 9, Rule 13:…", November 2011" Bay Area Clean Air Plan Stationary Source Control Measure SSM-9 – Workshop Report November 2011" http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/Workshops/2011/0913_WR_111511.ashx?la=en
Emission Calculation based on AMEC Report, and WS Clinker Production, Table ES-2,
(FAR) Federal Register Vol 75, No. 174, Thursday, September 9, 2010, Rules and Regulations http://www.gpo.gov/fdsys/pkg/FR-2010-09-09/pdf/2010-21102.pdf
(FLTE) The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. http://www.dep.state.fl.us/air/emission/construction/cemex/TEPD384A.pdf

Sierra Club's Report on Cement Plant Regulation in the
San Francisco Bay Area
9 July 2012
Pollutant Reduction Equipment
Appendix B

Input Materials

Aside from the equipment itself, the emissions will be dependent on the input materials used in the processing. The source of heating fuel and carbon material for the processing can be coke, coal, or natural gas. In general, natural gas will have fewer impurities such as sulfur or mercury. Various purities of coke and coal are available.

Injection of Absorbent Materials

Activated Charcoal or lime can be injected into the process to remove toxics such as mercury and control SO2. The type, amount and rate of injection will all effect the efficiency removal.

Selective Non-Catalytic Reduction (SNCR)

This technique involves the injection of an nitrogen rich chemical such as ammonia or urea into the exhaust streams. It is employed to remove NOx and is recommended in the WS.

Selective Catalytic Reduction (SCR)

This technique is similar to SNCR, but a catalyst is present. It operates at a lower temperature (570-700 F). SCR is a less tested technique and does require removal of dust. As pointed out in the WS, some plants do have both SNCR and SCR. Both of these techniques use the introduction of a nitrogen rich chemical and thus care must be taken that only minimal amounts of ammonia are emitted. This concern is called "ammonia slip."

Coke Filter

The entire exhaust stream can be filtered coke. The coke acts as an absorbent and removes pollutants. The highly efficient Swiss Plant Holcim Siggenthal PH has a POLVITEC coke filter.

Relative Value of Emission Reductions Based on MPEM

The MPEM can be used to compare the benefit of reducing the various air pollutants, as shown in Table 1-2. For this exercise, the MPEM was used to calculate the value of reducing one ton of each pollutant or precursor that is included in the methodology. The relative weight for each pollutant was then determined, using ROG as the unit of comparison. Since studies show that PM is the predominant cause of air pollution-related mortality, as discussed below, and mortality has by far the highest value ($6.9 million) among the health endpoints used in the MPEM, it is not surprising that the MPEM-derived weighting factor for PM reductions is much higher than for the other pollutants analyzed. These weighting factors are instructive for purposes of comparing the value of reducing the various pollutants. They can also be used to calculate the weighted tons of emissions reduced by various control measures for purposes of comparing their overall air quality and climate protection benefit.

Table 1-2. Dollar value of reducing one ton per year of each pollutant using MPEM.

Pollutant	$$ Benefit: Reducing One Ton Per Year	Weighting Factor *
ROG	$4,800	1.0
NOx	$7,300	1.5
Diesel PM2.5	$459,300	96.1
Direct PM2.5 (no diesel)	$456,400	95.5
SO2	$37,900	7.9
Ammonia	$53,500	11.2
Acetaldehyde	$5,300 ($500 plus $4,800 as ROG)	1.1
Benzene	$ 12,000 ($7,200 plus $4,800 as ROG)	2.5
1,3-Butadiene	$30,200 ($25,400 plus $4,800 as ROG)	6.3
Formaldehyde	$ 6,000 ($1,100 plus $4,800 as ROG)	1.2
CO2 equivalent	$28	0.03

Page 1-13 from "Bay Area Clean Air Plan 2010 Final Clean Air Plan – Volume I" adopted September 15, 2010; BAAQMD, Association of Bay Area Governments: bcdc; Metropolitan Transportation Commission

TABLE ES-2

SUMMARY OF FACILITY EMISSION RATE
Lehigh Southwest Cement Company
Cupertino Facility

CAS No.	Chemical	Annual Average (lb/yr)		
		2005 Production	Average Production in 2008/2009	2010 Production [1]
75070	Acetaldehyde	1.16E+03	6.71E+02	7.03E+02
107028	Acrolein	4.49E+01	2.61E+01	2.73E+01
7440382	Arsenic	2.30E+00	1.37E+00	1.43E+00
56553	Benz[a]anthracene	1.31E-02	7.60E-03	7.96E-03
71432	Benzene	9.65E+03	5.60E+03	5.86E+03
50328	Benzo[a]pyrene	2.95E-04	1.71E-04	1.79E-04
205992	Benzo[b]fluoranthene	1.87E-03	1.08E-03	1.14E-03
207089	Benzo[k]fluoranthene	2.95E-04	1.71E-04	1.79E-04
100447	Benzyl chloride	1.01E+02	5.87E+01	6.14E+01
7440417	Beryllium	7.35E-01	4.44E-01	4.63E-01
106990	1,3-Butadiene	9.18E+01	5.33E+01	5.58E+01
7440439	Cadmium	1.04E+00	6.28E-01	6.54E-01
56235	Carbon tetrachloride	6.16E+01	3.57E+01	3.74E+01
108907	Chlorobenzene	5.54E+02	3.21E+02	3.37E+02
67663	Chloroform	2.87E+01	1.66E+01	1.74E+01
18540299	Chromium VI	2.19E+00	1.29E+00	1.35E+00
218019	Chrysene	3.86E-02	2.24E-02	2.35E-02
7440508	Copper	1.51E+01	9.25E+00	9.64E+00
1175	Crystalline silica	1.04E+03	7.27E+02	7.48E+02
53703	Dibenz[a,h]anthracene	2.95E-04	1.71E-04	1.79E-04
106467	p-Dichlorobenzene	5.89E+01	3.42E+01	3.58E+01
75343	1,1-Dichloroethane	1.98E+01	1.15E+01	1.20E+01
78875	1,2-Dichloropropane	2.71E+01	1.57E+01	1.65E+01
542756	1,3-Dichloropropene	1.11E+02	6.45E+01	6.75E+01
9901	Diesel PM	2.47E+01	2.47E+01	2.47E+01
75003	Ethyl chloride	3.87E+01	2.25E+01	2.35E+01
100414	Ethylbenzene	9.59E+02	5.56E+02	5.83E+02
106934	Ethylene dibromide	6.02E+01	3.49E+01	3.66E+01
107062	Ethylene dichloride	2.38E+01	1.38E+01	1.44E+01
50000	Formaldehyde	6.31E+01	3.66E+01	3.83E+01
35822469	1,2,3,4,6,7,8-HpCDD	9.63E-06	5.58E-06	5.85E-06
67562394	1,2,3,4,6,7,8-HpCDF	4.67E-06	2.71E-06	2.84E-06
55673897	1,2,3,4,7,8,9-HpCDF	1.20E-06	6.98E-07	7.31E-07
39227286	1,2,3,4,7,8-HxCDD	2.69E-06	1.56E-06	1.63E-06

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Page 2 of 3 in Table ES-2

Sierra Club's Report on Cement Plant Regulation in the
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Appendix E – Table from Florida Department of Environmental Protection

The Department of Environmental Protection, Division of Air Resources Management, Bureau of Air Regulation produced a report "Technical Evaluation Preliminary Determinations Draft BACT Determinations, CEMEX CEMENT COMPANY, BROOKSVILLE HERNANDO COUNTY" dated July 17, 2007. In developing their regulations, the report summarized regulations at other cement plants within the United States. Although the report was prior to the EPA NESHAPs Regulation in 2010, half the plants had SO_2 ratios of 0.2 lb/ton and all but a couple had NOx ratios of less than 2.0 lb/ton. The WS report has no regulation proposed for SO_2 (2010 actuals were 1.15 lb/ton) – almost ten times the regulation of these plants. The WS report regulates NOx at 2.3 lb/ton, which although this is an improvement over 2010 actual ratios, is still above the ratio for the majority of these other plants.

Table 10. Emission Limits for in Recent Cement Plant Permits in lb/ton of Clinker.

Project	NO_X (lb/ton)	SO_2 (lb/ton)	CO (lb/ton)	VOC (lb/ton)	PM_{10} (lb/ton)	Total[a] (lb/ton)
CEMEX Brooksville (Application)	1.95	0.20	2.9	0.12	0.23	2.50
CEMEX Brooksville (Draft BACT)	1.50	0.20	2.0	0.115	0.15	1.97
Drake Cement LLC, AZ	1.14/1.95	0.06	3.6	0.12	0.21	1.53
Ash Grove/Moapa, NV (Draft BACT)	1.95	0.42	1.05	0.0625	0.095	2.53
Sumter Cement, Center Hill	1.95	0.20	2.9	0.115	0.15	2.42
American Cement, Sumterville	1.95	0.20	2.9	0.12	0.15	2.42
Suwannee American, Branford Kiln 2	1.95	0.20	2.9	0.12	0.17	2.44
Florida Rock, Newberry Kiln 2	1.95	0.28	3.6	0.12	0.28	2.63
Rinker/FCS, Brooksville Kiln 2	1.95	0.23	3.6	0.12	0.20	2.50
Holcim Lee, Missouri (2004)[d]	2.4/1.6	1.26	6.0	0.33	0.35	4.34
CEMEX Brooksville Kiln 2 (rev. 2007)[b]	2.0	0.20	2.0	0.115	0.15	2.47
Titan Florida Medley (1999, rev. 2006)[c]	2.17	0.50	2.0	0.14	0.10	2.91

APPENDIX B

COMMENTS ON FINAL PROPOSAL AND RESPONSES

Appendix B – Comments on Final Proposal and Responses

During the public comment period on the final proposal, staff received written comments as well as several questions on the proposed rule from 11 individuals and organizations. After the close of the public comment period, staff received written comments from Lehigh Southwest Cement Company LLC, and one organization. A summary of the comments, questions and staff response is provided below. Following the summary are copies of all written comments received.

Margo Sidener, President and CEO of Breathe California of the Bay Area in a letter dated 20 July 2012:

Comment:

1. "On behalf of Breathe California of the Bay Area, I am writing to urge the Air District to adopt a specific regulation for cement plants…that is more protective of health than the current draft…I am surprised to see that the draft plan for cement plants does not have requirements at least as stringent as the proposed NSPS EPA standards…We encourage you to regulate to the most technologically achievable emissions…The US Public Health Code 42 USC 7416 allows local government agencies to impose strict regulations than the EPA regulation, and we urge you to take advantage of this stipulation as it relates to Lehigh."

Response:

1. The District has the authority to adopt emission limits more stringent than those required under federal regulations; however, any emission standard adopted by the District must be evaluated for cost-effectiveness and socio-economic impact as per California law. These analyses are part of the staff report, and staff believes that the proposed rule contains the most stringent, health protective standards that are both technologically and economically feasible at this time. The proposed regulation contains emissions standards that are as stringent as or more stringent than the applicable standards contained in the federal rules. Since their initial adoption, the NSPS (1971) and NESHAP (1999) have undergone several amendments, with standards generally becoming more stringent at each revision. The pertinent dates for the most recent amendments to the federal rules are June 16, 2008 for the NSPS, and May 6, 2009 for the NESHAP. Lehigh has not undertaken any changes in operation or equipment after the effective dates that could be deemed as "modifications" per the definitions contained in the appropriate sections of the code of federal regulations. The standards contained in the proposed District regulation represent reasonably achievable cost-effective emission standards for the facility, and in fact represent more stringent standards than the applicable federal rules since, as an existing facility, Lehigh is not subject to the amended NSPS or NESHAP standards for "new or modified" facilities.

David Whittum in an email dated 21 July 2012:

Comment/question:

2. I read in the paper yesterday a BAAQMD notice of a CEQA item for the 9/19 meeting but had great trouble to find it in the links on the pages. Finally went back to the newspaper and hand entered a link given there and then still could not find it. Do you have the link handy to the CEQA document, thanks?

Response:

2. Provided links to all relevant documents.

Cathy Helgerson via emails dated 27 and 30 July 2012:

Comments/questions:

3. Emissions of NOx and SO_2 and probably carbon dioxide (CO_2) from the kiln are used to dry out the petroleum coke and the emissions out these two pipes are not being monitored.
4. I am concerned about NOx, SO_2, and CO_2 emissions that are a great hazard, and BAAQMD seems to think we can live with these emissions. There is a cumulative effect that is never considered, along with dust that is going all over the valley.
5. Petroleum coke is a waste product and is also radioactive, and more hazardous than coal. Doesn't this make the plant subject to EPA's rules for incineration of hazardous wastes?
6. How was the SO_2 limit in Lehigh's Title V permit derived?
7. What do they monitor at Monta Vista Park? I do not believe that the District is monitoring emissions correctly, as the numbers are too low. I am not confident in the testing for the Monta Vista Park report and do not believe the results.
8. The petroleum coke is delivered dry and is then is allowed to be left out in the open and gets wet and this runoff is going into the Permanente Creek.

Responses:

3. Emissions from the kiln are used to heat both raw materials and the petroleum coke so that not as much coke needs to be burned in the kiln to obtain the temperatures needed to produce cement clinker. This results in lower emissions due to more efficient operation. The emissions that are from this part of the exhaust gas are added to the emissions that are monitored from the main exhaust.
4. Staff is proposing this rule in order to reduce emissions from the Lehigh facility. Under the proposed rule, emissions from all points will be monitored, and each emission point (whether it goes through the coke or not) will have to satisfy a health risk screening assessment to demonstrate that there is minimal risk to the surrounding community.
5. Petroleum coke may be considered a byproduct of petroleum refining rather than a waste product. EPA does not consider it a hazardous waste subject to rules regarding incineration of hazardous wastes.
6. The SO_2 limit in the Title V permit was set when Lehigh switched their wet kiln process to the dry kiln process in the early 1980's using the best available standard for equipment at that time.

7. At the Monta Vista monitoring site, ambient concentrations of mercury, and a number of other toxic compounds and other pollutants are monitored. The December 8, 2011 Summary and Analysis of the Cupertino Air Monitoring Results was provided to the commenter and a May 16, 2012 updated version of that report is available at http://www.baaqmd.gov/Divisions/Engineering/Air-Toxics/Special-Reports.aspx.
8. The petroleum coke is only wet because it is stored and handled outdoors at both the refinery and the cement plant (although the coke may be covered during transport). The kiln exhaust may dry the petroleum coke, but the main purpose is to heat it, otherwise the exhaust heat is wasted and more coke has to be burned to get the high temperatures necessary to make cement clinker.

Dr. Gary Latshaw via emails dated 23 July, 1, 2, 3, and 10 August 2012:

Comments/questions:

9. Please clarify your calculations for expected emissions reductions of NOx, PM, mercury, hydrochloric acid (HCl), and benzene.
10. I understand the technical difficulties in making PM measurements. How confident are you in the values listed in Table 3 (2010 emission rates) for SO_2, and NOx?
11. How accurate are the emission rates for toxic compounds (mercury, organic hazardous air pollutants (HAPs), benzene, 1,3-butidine, etc.) used in the Health Risk Screening Assessment by AMEC?
12. What does parametric monitoring mean?
13. I want to comment on the applicability of using "$Cost/yr" coefficients in assigning economic cost to the emissions from the plant. The modeling performed for the Clean Air Plan 2010 did assign a modification to the emissions sources that would be uniform and area wide. In your Draft Staff Report, you acknowledge that reducing NOx to NSPS levels would cost an additional $7,572/ton of NOx reduced, which is well within the typical range for cost effectiveness. But you base your decision instead on the socio-economic impact as described in the BAE report. That report uses the industry average profit rate of 6.5% and I believe that is too low since Lehigh is the fourth largest plant in the country, and would have pricing flexibility due to economies of scale.
14. I am attaching a report from Dr. Neil Carman that is critical of the current baghouse arrangement of 32 stacks and the effect of this complex geometry on accurate measurement of emissions.

Responses:

9. The emissions reductions estimates are determined by a variety of methods. Some are based on comparisons of proposed standards to current standards, some utilize existing source test data, or the emissions inventory, and some are based on expected emissions reductions for particular control equipment. The calculated emissions reduction for NOx is found by applying a ratio of the expected emission rate reduction due to the lower standard and the current emissions rate (in lb/ton of clinker) to the 2010 inventory emission rate (in lb/year). The emissions reductions for both mercury and PM were based on Lehigh's estimated reductions combined with our own internal analysis of those estimates. PM emissions from Lehigh's kiln are already significantly controlled. The

modifications to the dust control system along with other system components are expected to provide an additional 10% reduction in emissions. 10% of the emissions inventory estimate of 33 pounds results in an emissions reduction of 3.3 pounds. For mercury, a 93% reduction is expected due to the activated carbon injection (ACI) and dust shuttling systems. 93% of the emissions inventory estimate of 0.72 pounds results in an emissions reduction of 0.67 pounds. Emissions reductions for HCL are arrived at similarly to that for mercury, and estimated emissions reductions for benzene are based on application of the revised standard for organic HAPs in the revised NESHAP as well as the proposed District rule.

10. Lehigh has continuous emissions monitoring systems (CEMS) for NOx and SO_2 required by permit, so the emissions factors for these are very well established.
11. All toxic air contaminant (TAC) emissions estimates for the purposes of risk screening are accurate or perhaps err slightly on the side of overestimation for health protective reasons (if the risk falls within levels of acceptability when emissions are overstated, then it is clearly acceptable for lower emissions).
12. Parametric monitoring normally means monitoring a parameter other than the actual emissions, such as temperature or pressure. For the proposed rule we used the term for some CEMS (mercury, ammonia, HCl) because our own internal Manual of Procedures (MOP) definition of CEMS only includes NOx, SO_2, oxygen (O_2), carbon monoxide (CO), and CO_2. CEMS for mercury, ammonia, and HCl have been developed relatively recently, but the EPA has established methodologies for their use. In the proposed District rule, they are referred to as parametric monitors but the EPA test methods and performance specifications are cited rather than our own test methods (due to the definition issue). In time, staff expects to amend our MOP to include these CEMS for other pollutants, and at that time we will revise all rules addressing those pollutants to cite the MOP.
13. The utilization of a Multi-Pollutant Evaluation Method (MPEM) in the 2010 Clean Air Plan is the first ever instance of this approach in development of a Clean Air Plan. We have used the MPEM to help prioritize control measures in the Plan. For consideration in the adoption of a specific regulation, the assessments of cost effectiveness and socioeconomic impact are required by California Health and Safety Code sections 40703 and 40728.5 and the methodology of that assessment is well established. As for determining the profitability of the Lehigh plant, the consultant is limited to those data which can be accessed (either an estimate based the Heidelberg annual report, or the industry average IRS data which were both found to be consistent). We looked at the information available and determined that the industry average was appropriate. It is unclear how the commenter has determined that Lehigh is the fourth largest facility in the country. Staff has contacted EPA, and based on a 2006 inventory, there are 5 larger kilns, 5 of comparable size (capacity within 10% of Lehigh) and several plants that have multiple kilns whose aggregate capacity is greater or comparable to that of Lehigh Permanente.
14. We agree that the current geometry of the stacks makes accurate operation of CEMS unlikely. The installation of a CEMS must be approved by the District, and procedures consistent with EPA procedures have been developed by our technical staff for locating CEMS in relationship to stack flows. Any monitoring equipment installed by Lehigh will have to meet this procedure. The proposed regulation requires continuous monitoring of

all emission points from the kiln, just as is required by the proposed NESHAP. Due to the high cost of 32 sets of CEMS, Lehigh initially proposed a 300 foot single stack, but currently Lehigh anticipates that they may need to construct more than one stack, and that it may not be 300 feet tall. It is possible that the facility will construct a single 300 foot stack, or possibly two or three somewhat smaller stacks. The proposed rule requires that the stack or stacks be of sufficient height to ensure adequate health protections as demonstrated by a Health Risk Assessment (HRA) assuming maximum operating capacity of the facility. It is extremely unlikely that the facility can comply with the proposed regulation utilizing the dust collection system in its current configuration of 32 stacks.

Joel Masser in a letter sent via email dated 9 August 2012:

Comments/questions:

15. The new cement regulations must protect public health and our environment above protecting profits. The economic benefit of the plant to our local community does not compensate for the health costs incurred by their operation.
16. At a bare minimum, the regulations must require a single stack for emissions from the kiln, a limit on SO_2 emissions, and more protective emissions limits for PM and mercury. The more stringent the better.

Responses:

15. Staff believes that the proposed regulation contains the most stringent, health protective standards that are both technologically and economically feasible at this time.
16. See response 14 above regarding the single stack. The issue of attainment of the recently revised national one-hour ambient air quality standard for SO_2 is currently in flux and as yet undetermined. District air quality monitoring data show ambient SO_2 levels well below the standard. It is not expected at this time that SO_2 reductions at Lehigh will be required to attain the SO_2 standard. Should the District determine a need for SO_2 reductions from the facility in the future, staff may propose that the rule be amended to include a standard that ensures emissions from the Lehigh facility do not cause an exceedance of the new one-hour ambient air quality standard for SO_2. The emission limit for PM in the proposed rule is more stringent than the standard in the amended NESHAP (as proposed in June 2012) and is based on that which is achievable utilizing the state of the art controls. The emission limit for mercury in the proposed rule is as stringent as that in the amended NESHAP (June 2012) and is based on that which is achievable and measurable utilizing the state of the art controls and monitors.

Carmen Goodrich in a letter dated 9 August 2012:

Comments/questions:

17. The District needs to impose the most protective and at the same time feasible regulation. Lehigh is one of the largest cement plants in the U.S. and is located adjacent to Silicon

Valley, one of our State's key economic engines, and a major population center. Annual health costs from the cement plant pollution are estimated in the tens of millions of dollars. The health effects of pollution are more expensive than the cost of reducing the pollution.

18. The regulation must require a single stack for emissions from the kiln, a limit on SO_2 emissions, and more protective emissions limits for PM and mercury.

Responses:

17. Staff believes that the proposed limits will reduce emissions and benefit public health, and are the most stringent that are both technologically and economically feasible at this time. Staff has proposed that the 2015 NESHAP standards be imposed starting in 2013 specifically because of the proximity to Bay Area residents.
18. See response 16 above.

Hermann von Drateln in a letter dated 9 August 2012:

Comments/questions:

19. See comments/questions 17 and 18 above.

Responses:

19. See responses 17 and 18 above.

Melba von Drateln in a letter dated 9 August 2012:

Comments/questions:

20. See comments/questions 17 and 18 above.

Responses:

20. See responses 17 and 18 above.

Linda Sell in a letter sent via email dated 10 August 2012:

Comments/questions:

21. See comments/questions 17 and 18 above.

Responses:

21. See responses 17 and 18 above.

Barry Chang in a letter sent via email dated 10 August 2012:

Comment/question:

22. The District issued another spare the air day yesterday.
23. Bay Area air quality does not meet State and Federal Standards.
24. The proposed regulation shall protect more than 7.2 million people who live or work in the region. Thank you.

Responses:

22. The Spare the Air program was established by the District to educate people about air pollution and to encourage them to change their behavior to improve air quality. The summer Spare the Air program is a voluntary outreach campaign that has been operated for nearly two decades with alerts in summer when ground-level ozone or "smog" becomes a pollution problem. District meteorologists evaluate the air pollution levels and meteorological conditions in order to forecast which days may have unhealthy air quality.
23. The District currently does not meet State and Federal Standards for Ozone and PM. In developing Stationary Source Control Measure SSM-9 of the Bay Area 2010 Clean Air Plan, the District identified Portland cement manufacturing as a potential source of emissions reductions of nitrogen oxides (NOx), a precursor of ozone and secondary fine particulate matter. Additionally, the control measure sought to reduce particulate matter (PM) from the manufacturing of Portland cement. The goal of adopting this proposed regulation is to reduce these emissions and enable the District to make progress toward meeting federal and state ozone and particulate standards – for which the District is currently in a non-attainment status – as well as reduce emissions of mercury and other TACs to reduce associated health impacts.
24. That is our intent.

Lehigh Hanson in a letter sent via email dated 30 August 2012:

Comments/questions:

25. Lehigh is committed to outstanding environmental stewardship and welcomes the opportunity to continue working with the District after the close of the comment period to ensure that the regulation is fair, balanced and – most importantly – achievable.
26. Lehigh believes that the District's proposed regulation will place the Permanente plant at a competitive disadvantage to other plants in California as well as to plants around the country and to potential imports. This is especially true if the US EPA's NESHAP reconsideration proposal which is to be finalized by December 20, 2012, increases the PM standard from 0.04 to 0.07 lbs/ton of clinker and monitoring requirements which differ from the District's proposal.
27. Lehigh opposes two other of the District's proposed emission standards:
    a. PM standard for clinker coolers; and
    b. Dioxin/furan (D/F) limit. (Requests change in standard to allow higher limit of 0.4 ng-TEQ/dscm if dust collector inlet temperature during performance test is below 400^{o}F, consistent with NESHAP requirements).

28. Lehigh requests an extension of the compliance date for stack modifications (36 months lead time). Lehigh believes that installation of a new single stack cannot be accomplished in the allotted timeframe set out in this proposed rule.
29. Lehigh supports the District's proposal to increase the organic HAP standard to 12 ppmv, and the inclusion of alternate compliance standard for Total Hydrocarbons of 24 ppmv as is consistent with most recently proposed NESHAP standards.
30. The District has not demonstrated the need or the regulatory requirement to establish these more stringent emission standards which are being imposed on the Permanente facility. It appears the District is arbitrarily setting these limits and Lehigh is unaware of what procedure or policy has been followed to establish these more stringent emission standards.
31. Proposed regulation is "arbitrary, capricious, and without reasonable or rational basis," and sets limits violating California law requiring generally applicable regulations. Lehigh provides case-law citations. Lehigh commented that because proposed 9-13 applies to only one facility in the Bay Area District, it violates a requirement of California law that regulations be "generally applicable." Lehigh asserts that in a situation such as this, where there is one facility subject to a regulation at the time it is adopted, State law requires an Air District to use permitting rather than rulemaking authority.
32. Lehigh's comments imply that the Air District's permitting authority would be both sufficient and more appropriate for regulating a single facility.
33. Lehigh requests changes to mercury (Hg) and HCl test frequency, and has concerns with HCl limit due to raw mill on/off conditions.
34. Lehigh requests minor changes to dust mitigation plan elements.
35. Lehigh provided 4 attachments to their comment letter:
    a. EPA Reconsideration Proposal of July 18, 2012. National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants [EPA-HQ-OAR-2011-0817; FRL-9692-9]; RIN 2060-AQ93
    b. Portland Cement Reconsideration Technical Support Document; US EPA, June 15, 2012
    c. Engineering and Economic Factors Affecting the Installation of Control Technologies for Multipollutant Strategies; US EPA, October 2002 [EPA-600/R-02/073]
    d. PCA Comments on the EPA's Proposed Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units; Proposed Rule (Docket Number: EPA-HQ-OAR-2003-0119); Portland Cement Association, August 23, 2010

Responses:

25. Staff appreciates Lehigh's commitment to work toward effective regulations going forward, just as it has appreciated working with Lehigh for over 2 years developing this proposal.
26. Staff believes that the PM standard in the proposed regulation is reasonable and achievable at the Lehigh facility as determined by the specified compliance methods of

the regulation. The proposed regulation does not include the monitoring requirements of EPA's NESHAP reconsideration proposal for PM, only established methods of source testing. Based on source testing going back over 10 years, Lehigh can meet District's proposed PM emissions limit. The only source test that showed emissions above the proposed standard was a single run of a three run test when the raw mill was not operating. One of the primary purposes of the lime slurry injection (LSI) system is to reduce emissions to a level at least consistent with emissions when the raw mill is operating, so it is unlikely that emissions would be above the standard once this system is up and running.

27. Other two standards:
    a. Staff believes this PM standard for emissions from the clinker cooler is reasonable and achievable. All source testing of the clinker cooler indicates compliance with proposed standard is currently being achieved.
    b. Again, source testing indicates that Lehigh can easily meet the D/F standard regardless of inlet temperature to the dust control device (Feb 11, 2008 source testing shows average of 0.0035 ng-TEQ/dscm over three runs with inlet temperature to dust control device of 374^{o}F).
28. Lehigh has anticipated construction of a single, taller stack for several years. Modifications to the Lehigh facility to incorporate a single emissions stack was first suggested by Lehigh in a letter from Shane Alesi, Vice President of Heidelberg Technology (parent company of Lehigh) dated December 2, 2009:

    "The existing kiln dust collector contains 32 individual compartments with their own exhaust fans and stacks. Lehigh may propose to install a single dust collector, which will be compartmentalized, with a single dust collector fan and single stack. This will allow for enhanced monitoring of PM and other gaseous pollutants. The new stack could be mounted to/near the side of the preheater tower."

    This intent was reiterated in a letter dated November 12, 2010 submitted by the consultant hired by Lehigh to perform the HRA, AMEC Geomatrix addressing the protocol for revisions to the Health Risk Assessment (HRA):

    "As we discussed at the October 12, 2010 meeting, a third emission scenario will be added to the AB2588 HRA to reflect expected conditions in 2013 once planned facility changes are completed….the NESHAPs requirements will specifically affect emissions of hydrochloric acid and mercury. In addition, the kiln at the facility will be reconfigured to emit from a single 300 foot stack rather than the 32 rooftop stacks currently in place."

    And again in the revised HRA submitted March 30, 2011 by AMEC Geomatrix, page 35:

    "As outlined in Appendix A, a 2013 emission scenario was developed reflecting expected conditions in 2013 once planned Facility changes are completed. The projected 2013 scenario assumes that maximum annual clinker production of 1,600,000 tons is achieved. NESHAPs requirements will result in changes to emission rates of mercury and hydrochloric acid, which are relevant to the AB2588 HRA. Changes to meet NESHAPs requirements will be made by 2013….In addition, the kiln at the facility will be reconfigured to emit from a single 300 foot stack rather than the 32 rooftop stacks currently in place."

Throughout this rule development process, District staff has included a requirement for a modified stack in all proposals shared with Lehigh and in subsequent published drafts. In response to comments from Lehigh on the workshop proposal, the requirement has been modified to allow design flexibility while maintaining the health protections identified in the HRA.

In Lehigh's August 30, 2012 comment letter, a 3 year schedule is proposed for compliance; however, in the same letter, Lehigh indicates that they are committed to installing a single stack and have been working on the issue for over a year. They state that they have performed preliminary design work, review for a location and other engineering work. As noted above, the HRA has been completed and approved by District Staff. The schedule provided by Lehigh also includes 5 months for process connections and CEMS troubleshooting and relative accuracy test audit (RATA) confirmations. However, the CEMS for NOx is in place and operating, and monitors for ammonia, mercury, HCl, and total organics have been purchased and troubleshooting and RATA testing for these began as early as 2010.

The schedule also includes 9 months for third party review and approval (County of Santa Clara, and FAA). District staff recognizes the potential for delay and lack of control in the review by third parties; however, staff is committed to working with these agencies to aid in the review process to encourage timely approval. In the event that delays occur, District staff is prepared to work with Lehigh to ensure that they are able to make the changes necessary to their facility to ensure compliance with the regulation.

29. The District appreciates Lehigh's concurrence.
30. The rationale for the proposed rule is described in detail in the Staff report. The emissions standards contained in the proposed rule that are more stringent than those in the NESHAP (PM and D/F) are intended to protect and benefit public health and are currently being achieved at Lehigh as demonstrated by over 10 years of source testing.
31. Proposed regulation 9-13 is in fact a generally applicable regulation. It applies to any Portland cement facility located within the District's jurisdiction. Though it may be unlikely that a second cement plant would locate in the Bay Area, if one did, it would be subject to 9-13. A regulation is not legally invalid because it happens to apply to only one facility. The cases cited in Lehigh's comment letter do not deal with regulations applicable to single facilities.
32. Although there may be some overlap between rulemaking and permitting authority, they are by and large intended to address different situations. The District's ability to limit emissions through permitting is largely (though not exclusively) intended for construction of new facilities or modifications at existing facilities. Regulations, by contrast, are not so limited in scope, and thus can be applied to an existing operation. If Lehigh's argument were correct, there would be a gap in the District's legal authority for limiting emissions from existing operations where there happens to be only one facility of a certain type within the Bay Area District. It is highly unlikely that this was the intent behind the District's statutory authority. Lehigh's concern appears to be a higher level of judicial deference when reviewing regulations as opposed to permit actions. Adoption of a regulation is a quasi-legislative action entailing significantly more process than permit

issuance. Regardless, the District's use of a regulation rather than a permit was not influenced by the type of judicial review entailed by each.

33. There is no basis for changing the testing frequency for those pollutants. District staff did change the organic HAP testing frequency to match up with that for D/F since these two rely on monitoring of a parameter, rather than a CEMS that directly monitors emissions. Hg and HCl require a CEMS. The LSI will reduce emissions to a level consistent with operation when the raw mill is operating, so the situation posed by Lehigh is unlikely to occur.
34. All provisions in the Fugitive Dust Control Measures section of the proposed regulation are taken directly from the Fugitive Dust Control Plan developed by Lehigh and reviewed by District staff as part of Lehigh's Title V permit. These elements need to be consistent with what has already been approved in that permit.
35. Staff has reviewed the attachments to Lehigh's comment letter as they pertain to the current regulatory effort. These documents are more directly related to EPA regulatory efforts which differ from those of the District as indicated in the comments above. Citations were provided in Lehigh's comments above rather than the actual documents at the end of this appendix as they amount to over 484 pages of text.

Santa Clara County Medical Association in a letter sent via email dated 10 September 2012:

Comments/questions:

36. Santa Clara County Medical Association (SCCMA) asks that all current violations of the Lehigh facility be corrected, and that new EPA standards are implemented and directly monitored from a single stack.
37. Adoption of the Regulation will improve current standards for NOx and PM but it would not address SO2, and is not in line with the proposed NESHAP standard for mercury of 21 lbs/million tons of clinker.
38. Lehigh operates in a densely populated area so it should be subject to the more stringent standards for new and modified facilities.
39. The societal costs of pollution are immense on an individual and global perspective. It is our goal to support and promote health and well-being of our entire population in Santa Clara County, which is cost effective for all of us in the long run.

Responses:

36. The District responds to all violations of its regulations requires all facilities to take the steps necessary to bring them into compliance as expeditiously as possible. The proposed District regulation contains standards that are as stringent as or more stringent than the new EPA standards with an earlier compliance date. See response 14 above regarding emissions stack requirements.
37. See response 16 above.
38. See response 1 above.
39. See responses 13, 15 and 17 above.

BREATHE CALIFORNIA
Celebrating 100 Years in the Bay Area

July, 20, 2012

Ms. Kristina Chu, Public Information Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Reference: Proposed Portland Cement Plant Regulation 9, Rule 13

Dear Ms. Chu:

On behalf of Breathe California of the Bay Area, I am writing to urge the Air District to adopt a specific regulation for cement plants. Also, please adopt one that is more protective of health than the current draft.

Breathe California works closely with the Air District on several projects as our goals for reduced air pollution and improved public health are totally aligned. Therefore, I am familiar with the science-based and comprehensive, data-driven protocols that are in place at the Air District. Taking this into consideration and having studied its thorough Workshop Report (November 2011), I am surprised to see that the draft plan for cement plants does not have requirements at least as stringent as the proposed NSPS EPA standards. I refer, specifically, to: SO2 which for some reason is not proposed for regulation although it is feasible; NOx which is proposed at 2.3 lb/ton of clinker and not the more protective regulation of 1.5 lb/ton of clinker; and PM 2.5 which is the most difficult to understand. The PM 2.5 standard in the draft is proposed at 0.04 lb/ton of clinker when the actual reading of Lehigh's emission in 2010 was only 0.014 lb/ton of clinker (EPA recommendation would be 0.01 lb/ton of clinker).

As you know San Jose has been declared a CARE community due to its burden of air pollution, and of TACs in particular. Just downwind of the Cupertino Lehigh plant, it suffers from any excess pollution that the plant is allowed to spew. We encourage you to regulate to the most technologically achievable emissions, not only for the health of Cupertino residents, but also to protect those in San Jose's CARE area . Surely, here in Silicon Valley we can provide the highest technological levels necessary to be protective of health.

The US Public Health Code 42 USC 7416 allows local government agencies to impose stricter regulations than the EPA regulation, and we urge you to take advantage of this stipulation as it relates to Lehigh. We would all breathe easier.

Sincerely, Margo Sidener, MS, CHES, President and CEO

Margo Sidener

Breathe California of the Bay Area
1469 Park Avenue, San Jose, CA 95126
www.lungsrus.org

(408)998-5965 phone
(408)998-0578 fax

Robert Cave

From: David Whittum <whittum@gmail.com>
Sent: Saturday, July 21, 2012 10:20 AM
To: Robert Cave
Subject: link to BAAQMD notice of a CEQA item for the 9/19 meeting

Hi -

I read in the paper yesterday a BAAQMD notice of a CEQA item for the 9/19 meeting but had great trouble to find it in the links on the pages
http://www.baaqmd.gov/Public-Notices.aspx
Finally went back to the newspaper and hand entered a link given there,
http://www.baaqmd.gov/divisions/planning-and-research/rule-development/current-regulatory-public-hearings.aspx
and then still could not find it.

Do you have the link handy to the CEQA document, thanks -

Sincerely yours,

Dave

Robert Cave

From: Dan Belik
Sent: Thursday, July 26, 2012 3:54 PM
To: sharpset1@aol.com
Cc: Robert Cave; Brian Bateman
Subject: Lehigh cement kiln
Attachments: Final Summary and Analysis of Cupertino Air Monitoring .pdf

Ms. Helgerson,

We spoke on the phone on July 23 and you expressed your concerns about the Lehigh facility and asked some questions. I wanted to get back to you with what I could before the end of the week.

You told me that some of the emissions from the kiln are used to dry the petroleum coke. This is correct. As I understand it, the main purpose of doing this is to use the exhaust to heat both the raw materials and the petroleum coke so that not as much coke has to be burned in the kiln to obtain the temperatures to produce the cement clinker. The emissions that are in this part of the exhaust gas are added to the emissions that are monitored from the main exhaust. Under the proposed rule, the emissions from all points will have to be monitored, and each emission point (whether it goes through the coke or not) has to have a health risk assessment done to demonstrate that there is a minimal risk to the surrounding community. Control equipment for NOx, when it is installed, will have to be upstream of the coke drying, because the reaction to reduce NOx has to occur at a higher temperature than the coke is dried at. Most likely, after the drying and heating of the raw materials, they would vent the exhaust back into the main stack. Otherwise, they will have to install separate monitors. The temperature at which the petroleum coke is dried is far less than the ignition temperature for the coke, so I do not think that any additional SO2 is generated in the drying process.

You also asked whether the use of petroleum coke should make the cement plant subject to EPA's rule for incineration of hazardous wastes. I am not 100% sure, but I do not believe that EPA included petroleum coke in their rule for incineration of hazardous wastes. I am still trying to determine this absolutely and will get back to you when I find out for sure.

You asked about where the SO2 limit in Lehigh's Title V permit was derived. This is a limit that was set when they switched from their wet kiln process to the dry kiln process in the early 1980's. As I understand it, it was the best available standard for the equipment at that time. As I mentioned on the phone, if, based on EPA's determination, we need to reduce SO2 from Lehigh, we will work to set a standard in this proposed rule to do so.

Finally, you asked about what the Monta Vista site is monitoring. It does monitor for mercury, as well as a number of other toxic compounds and other pollutants. I have attached a document that lists all the toxic air contaminants that are monitored at that site. Table 1 on page 2 lists the criteria pollutants that are monitored and Table 2 starting on page 5 lists the toxic compounds that are monitored. The report is from the end of 2011, but the monitor is still being operated.

I hope this information is of some help. I will follow up with any further information that I can find.

Dan

Daniel Belik
Rule Development Manager
Planning, Rules and Research Division
Bay Area Air Quality Management District

Robert Cave

From: Dan Belik
Sent: Monday, July 30, 2012 9:59 AM
To: Cathy Helgerson
Cc: Robert Cave
Subject: RE: Lehigh cement kiln

Ms. Helgerson,

I understand that there are NOx and SOx monitors and that there are additional emissions that are vented through the petroleum coke. I confirmed this with Thu Bui. Those emissions are calculated based on the monitored emissions and added to the overall total. The proposed rule will set lower NOx emissions standards for the plant, and also require monitoring for every emission point. In addition there will be standards for dust from the trucks and roads and other points in the plant, such as quarrying operations, conveying and storage. As I explained, the rule will not set SOx standards, but we will consider those standards in the future if the area is out of attainment with the new federal standards.

The petroleum coke is only wet because it is an outdoor operation. It is outdoors when it is taken from the refinery (which I understand is in southern California). The coke may be covered when it is transported, I am not sure. The kiln exhaust, with emissions, that goes through the petroleum coke does dry it, but the main purpose is to heat it. Otherwise, that heat in the exhaust is wasted, and more coke has to be burned in the kiln to get the high temperatures necessary to make the cement clinker.

Dan

Daniel Belik
Rule Development Manager
Planning, Rules and Research Division
Bay Area Air Quality Management District
939 Ellis Street San Francisco, CA 94109
(415) 749-4786 dbelik@baaqmd.gov

From: Cathy Helgerson [mailto:sharpset1@aol.com]
Sent: Friday, July 27, 2012 11:10 AM
To: Dan Belik
Subject: Re: Lehigh cement kiln

Hello Dan,

I am not sure it you understand that there are already NOX and SO2 monitors set up at Lehigh and that the BAAQMD receives reports from Lehigh that record the levels that always seem to be way under the Max. high levels set by the BAAQMD. The BAAQMD sets very high levels and Lehigh could never get to those levels and I wonder how these high levels are determined.This as I mentioned I was told that the NOX and SO2 Gases are used to dry the Petrolium Coke out becasue it is wet you have not mentioned anything about the issue of the wet coke and how is it getting wet. I told you about the delivery of the Pet. Coke that it is delivered dry and is allowed to be left out in the open on one side in the front and it gets wet and that this runoff is going into the pond near by which eventually goes into the Permanente Creek. I would imagine this is during the rainy season but maybe they wet it down to keep the dust down also I do not know. I was told that they were drying out the wet Pet. Coke and they were using the NOX and SO2 to do so and that they had to dry it out before they could use it for fuel so what you are telling me does not seem correct.

I mentioned to you that there are two Petrolium Coke pipes one in the front and one in the back of the cement plant and that the emissions from the Petrolium Coke and the NOX and SO2 and probably the CO2 is being released from these pipes without any monitoring. I also mentioned that this could also mean that all of the NOX and SO2 emissions are not being monitored correctly and that this would lower the levels. The public is subjected to these levels that are not monitored and pulled away from the central location for NOX and SO2 emissions which would mean that the release of NOX and SO2 emissions is higher than recorded and is against regulations.

The Petrolium Coke emissions mixed with the NOX and SO2 emissions and probably with the CO2 emissions is not being monitored and it should be as soon as possible.

It seems from your e-mail that the NOX emissions will have a new area for a monitor which is upstream from the Petrolium Coke drying area this is probably very true and so will the SO2 and the CO2.

I am concerned about both NOX and SO2 levels of emissions and they have monitors on the site already monitoring those emissions they alway come in low and BAAQMD seems to think we can live with these emissions and that is not so. I would also suspect the CO2 emissions are a great hazard as well but they do not monitor that and they should. There is a cumulative effect that is never considered at the levels Lehigh is emitting and that is a great problem along with the dust that is going all over the valley which I am sure is distributed by the wind and the gases from NOX, SO2, Pet. Coke and CO2 emissions. They are not venting the exhaust back into the kiln from the Petrolium coke it is coming out of the two pipes I told you about.

Petrolium Coke is a waste material of Petrolium that is a fact and it is also radioactive this should cause everyone alarm and it is more hazardous than coal and no one is putting any monitors on the pipes at Lehigh and is allowing them to emit without any restrictions.

Seems the BAAQMD had better find out what is really happening up at Lehigh Thu Bui seems to know what is going on I have talked to her before maybe you need to talk to her to get the story straight and after that you can give me the true picture.

The SO2 emissions needs to be worked on but so do the NOX and what about the CO2 and Particulate matter with the dust going all over the valley harming the public what are you all going to do about that?

The trucks are a problems with the diesel fuel they emit and the dust in the roads BAAQMD does nothing about that.

I see you sent me the report for Monta Vista park this was last year I do not believe this report and find it unusual that BAAQMD could not monitor on the hill next to Lehigh instead they went down at the park. I am not confident in the testing that was done and will not believe the results. The monitoring should be on the fence of Lehigh and there needs to be a EPA investigation but to get them to do there job is impossible.

I know that sooner or later the truth will come in and there will be no way anyone can keep that from the public.

Please get back to me ASAP!
Cathy Helgerson
408-253-0490

-----Original Message-----
From: Dan Belik <DBelik@baaqmd.gov>
To: sharpset1 <sharpset1@aol.com>
Cc: Robert Cave <RCave@baaqmd.gov>; Brian Bateman <BBateman@baaqmd.gov>
Sent: Thu, Jul 26, 2012 3:54 pm
Subject: Lehigh cement kiln

Ms. Helgerson,

We spoke on the phone on July 23 and you expressed your concerns about the Lehigh facility and asked some questions. I wanted to get back to you with what I could before the end of the week.

You told me that some of the emissions from the kiln are used to dry the petroleum coke. This is correct. As I understand it, the main purpose of doing this is to use the exhaust to heat both the raw materials and the petroleum coke so that not as much coke has to be burned in the kiln to obtain the temperatures to produce the cement clinker. The emissions that are in this part of the exhaust gas are added to the emissions that are monitored from the main exhaust. Under the proposed rule, the emissions from all points will have to be monitored, and each emission point (whether it goes through the coke or not) has to have a health risk assessment done to demonstrate that there is a minimal risk to the surrounding community. Control equipment for NOx, when it is installed, will have to be upstream of the coke drying, because the reaction to reduce NOx has to occur at a higher temperature than the coke is dried at. Most likely, after the drying and heating of the raw materials, they would vent the exhaust back into the main stack. Otherwise, they will have to install separate monitors. The temperature at which the petroleum coke is dried is far less than the ignition temperature for the coke, so I do not think that any additional SO2 is generated in the drying process.

You also asked whether the use of petroleum coke should make the cement plant subject to EPA's rule for incineration of hazardous wastes. I am not 100% sure, but I do not believe that EPA included petroleum coke in their rule for incineration of hazardous wastes. I am still trying to determine this absolutely and will get back to you when I find out for sure.

You asked about where the SO2 limit in Lehigh's Title V permit was derived. This is a limit that was set when they switched from their wet kiln process to the dry kiln process in the early 1980's. As I understand it, it was the best available standard for the equipment at that time. As I mentioned on the phone, if, based on EPA's determination, we need to reduce SO2 from Lehigh, we will work to set a standard in this proposed rule to do so.

Finally, you asked about what the Monta Vista site is monitoring. It does monitor for mercury, as well as a number of other toxic compounds and other pollutants. I have attached a document that lists all the toxic air contaminants that are monitored at that site. Table 1 on page 2 lists the criteria pollutants that are monitored and Table 2 starting on page 5 lists the toxic compounds that are monitored. The report is from the end of 2011, but the monitor is still being operated.

I hope this information is of some help. I will follow up with any further information that I can find.

Dan

Daniel Belik
Rule Development Manager
Planning, Rules and Research Division
Bay Area Air Quality Management District
939 Ellis Street San Francisco, CA 94109
(415) 749-4786 dbelik@baaqmd.gov

Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Monday, July 23, 2012 7:30 AM
To: Robert Cave
Subject: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

Robert-

Could you please clarify several of the calculations that are behind the table 4 on page 19?

NOx: The table shows a reduction of 3,900 lb/day. This makes sense given: 9,200*(4-2.3)/4, where the 9,200/b/day emissions in 2010, and the 4 and the 2.3 are respectively the lb/ton of clinker are respectively the 2010 emission rate and the proposed regulation. So I understand those calculations.

PM: The table shows a reduction of 3.3 lb/day. However, using the same approach as for NOx, I cannot calculate this value. Using the same methodology as NOx, I calculate an increase in PM.

Mercury: The table shows a reduction of 0.67 lb. day. However, using the same approach as for NOx: 0.72*(3.05e-04-5.5e-04)/3.05e-04 = 0.59, which is less than the 0.67 you show in your table.

HCl: Since the regulations are in ppmv, how do you relate the emissions in lb/day to ppmv. Are their flow rates available?

Benzene: I don't see any regulation for benzene so how are the reduction figures calculated?

Thanks, Gary

PS I am glad you didn't move the NOx levels up as the new value Federal Regulations would allow.

--
Fight for Renewable Energies! Save the global ecology; create jobs; eliminate dependence on foreign oil; reduce military requirements

Gary Latshaw, Ph.D.
408-499-3006

Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Wednesday, August 01, 2012 2:59 AM
To: Robert Cave
Cc: Dan Belik
Subject: Fwd: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

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I hope this is of help. Sorry I could not provide more complete information.

Robert, please review and correct any of this as necessary.

Dan

Daniel Belik

Rule Development Manager

Planning, Rules and Research Division

Bay Area Air Quality Management District

939 Ellis Street San Francisco, CA 94109

(415) 749-4786 dbelik@baaqmd.gov

From: Gary Latshaw [mailto:glatshaw@gmail.com]
Sent: Monday, July 23, 2012 7:36 AM

To: Dan Belik
Subject: Fwd: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

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Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Thursday, August 02, 2012 9:16 AM
To: Robert Cave
Cc: Dan Belik
Subject: Re: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

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I hope this helps your understanding of our proposed rule and accompanying documents.

Robert Cave

Senior Air Quality Specialist

Rules and Research Division

Bay Area Air Quality Management District

rcave@baaqmd.gov

(415) 749-5048

From: Gary Latshaw [mailto:glatshaw@gmail.com]
Sent: Wednesday, August 01, 2012 2:59 AM
To: Robert Cave
Cc: Dan Belik

Subject: Fwd: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

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Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Friday, August 03, 2012 6:51 AM
To: Robert Cave
Cc: Dan Belik
Subject: Re: Clarification of calculations in Table 4 Re: Staff Report on Reg 9, rule 13

Robert - Okay. When I met with you and your colleagues there was a discussion about the technical difficulties in making the PM measurements.

Are you more confident of the SO2 and NOx published values for 2010?

Although I didn't do calculations involving mercury, many of the residents are concerned. Are the mercury emissions accurate?

How about the organics (ROG, Benzene, 1,3-Butadine, etc.) that were reported in the AMEC reports? In particular, I used Table ES-2 of their report (it is page 16 of my report).

What does "parametric monitoring" mean?

Thanks, Gary

On Thu, Aug 2, 2012 at 2:17 PM, Robert Cave <RCave@baaqmd.gov> wrote:

Dr. Latshaw,

The PM emission rate for Lehigh (for purposes of the emissions inventory) is essentially a factor determined by the District engineer assigned to the plant and an assumed abatement efficiency of 99.9%. The actually PM emissions are likely somewhat higher, though not significantly so. We could have done more research to determine the current PM emissions and thereby raise it. But we have already published emissions inventories at the lower rate, and this may have been perceived as cooking the books in order to achieve a greater PM emission reduction. Instead we tried to clearly state the difficulty in determining the actual PM emissions reductions likely to be achieved.

The primary focus of this rule development effort was not PM emissions reductions, but rather to ensure that the facility meet the TAC standards in the 2010 NESHAP as closely as possible (NOx emissions reduction being the other primary focus). As it is, the PM standard in the proposed rule is 40% less than the federal standard. One more thing to consider is that the emissions vary over time. The facility may be able to meet one emission rate averaged over 30 days, but not be able to meet that same instantaneous emission rate at all times due to peaks in the emission rate. Given that continuous emissions monitors for PM have not come to fruition (and are not likely to do so in the near term now that the federal rule has been delayed till 2015), we must use a shorter averaging period. One that is far likelier to contain only peak emissions, not an average over peaks and valleys.

Robert Cave

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Rules and Research Division

Bay Area Air Quality Management District

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(415) 749-5048

From: Gary Latshaw [mailto:glatshaw@gmail.com]
Sent: Thursday, August 02, 2012 9:16 AM

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Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Friday, August 10, 2012 4:50 PM
To: Robert Cave
Subject: Comments on the July 12th Report
Attachments: Statement from Dr Carmen re-Single Stack.docx

Mr. Cave - I have a couple of comments on the report.

Primarily I would like to comment about the applicability of using the "$Cost/yr" coefficients in assigning social economic cost to the emissions from the plant. The modeling performed for the Clean Air Plan 2010 did assign a modification to the emissions sources that would be uniform and area wide. So in this sense, my calculations are not directly applicable. However, in the absence of alternative mechanisms to make the social-economic cost calculation, I had to make that approximation. Although that adds an error to the estimate, I don't see a particular bias. The wind rose in the AMEC report shows the wind primarily will draw the air pollution from the plant into a heavily populated area. Since it operates all night I would assume with the inversion layer the emissions are spread out over the entire Santa Clara Valley.

In your July report you acknowledge that the cost of reducing the NOx emissions to NSPS levels would cost an additional $7,573/ton of NOx. You state that although "District rules to reduce NOx typically range between 7 to 20 thousand dollars per ton of NOx", your report states a concern about the social economic impact as described in the BAE report. That report relies critically on the profitability of the Lehigh Plant being 6.5%, the industry average. However, without information on the operation of the Lehigh Cupertino plant I don't see that that is a reliable assumption. The plant is the fourth largest in the country and I would assume would offer economies of scale. Also, such a large producer usually has substantial more pricing flexibiliity than other producers.

On that basis, I ask that you sincerely study imposing more protective regulations on NOx as well as the other pollutants. However, it is analyzed, the social economic costs from the plant air emissions are substantial. A concerned neighbor, Richard Adler, who has been out of town most of the time since your report was released, has had discussions with the National EPA. In those discussions they concluded annual social economic costs in the 100-200 million dollar range. About a factor of four greater than my calculations.

A neighbor sent me a report by a retired field investigator, Dr. Neil Carman, who has spent years inspecting plants such as Lehigh. I have attached that report for your review. He states that the complex geometry of the air flows in the ducts to the stacks of the bag house make an accurate determination of emission levels impossible. For a CEMS to work accurately both the air flow rate and pollutant concentrations must be known. He argues that the complex geometry makes determination of them impossible. He also states that monitoring all the stacks is essential.

I am appreciative that BAAQMD has taken a more protective stance on TACs ahead of EPA timelines, and have been more protective in some other areas. The CEMS monitors for NOx, SO2, and mercury are available from your information office. The data appear to confirm that mercury emissions are down from pervious levels.

Thanks for your assistance in clarifying various aspects of the July report promptly and clearly.

Sincerely, Gary

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Robert Cave

From: Gary Latshaw <glatshaw@gmail.com>
Sent: Thursday, August 23, 2012 5:42 PM
To: Robert Cave
Cc: Dan Belik
Subject: Re: Comments on the July 12th Report

Thanks for taking time to respond to my email, and correcting me on the size rankings of the plant.

I was glad to understand that we have identical concerns about the stack(s). If you recall, Lehigh sort of dropped a "bomb shell" at the meeting on May 21st in Cupertino when they abruptly stated they were not going to build a single stack. The backtracked a bit on that bold statement, but it didn't go over well.

Gary

On Thu, Aug 23, 2012 at 8:57 AM, Robert Cave <RCave@baaqmd.gov> wrote:

Dr. Latshaw,

We provide responses to all comments in the final staff report presented at the time of the Public hearing. In general, we do not respond directly to comments immediately after they are received. In the case of questions, we try our best to respond in a timely manner depending on the complexity of the questions. That is what we have tried to do in responding to your four previous emails.

This most recent email does not appear to contain a question. Nevertheless, as requested, here is a direct response.

The utilization of a Multi-Pollutant Evaluation Method (MPEM) in the 2010 Clean Air Plan, is the first ever instance of this approach in development of a Clean Air Plan. We have used the MPEM to help prioritize control measures in the Plan.

The assessments of cost effectiveness and socioeconomic impact are required by California Health and Safety Code sections 40703 and 40728.5 and the methodology of that assessment is well established. In 40728.5, socio-economic impact is defined as follows:

(b) For purposes of this section, socioeconomic impact means the following:

(1) The type of industries or business, including small business, affected by the rule or regulation.

(2) The impact of the rule or regulation on employment and the economy of the region affected by the adoption of the rule or regulation.

(3) The range of probable costs, including costs to industry or business, including small business, of the rule or regulation.

(4) The availability and cost-effectiveness of alternatives to the rule or regulation being proposed or amended.

(5) The emission reduction potential of the rule or regulation.

(6) The necessity of adopting, amending, or repealing the rule or regulation to attain state and federal ambient air standards pursuant to Chapter 10 (commencing with Section 40910).

As for determining the profitability of the Lehigh plant, the consultant is limited to that ~~we~~ which can be accessed (either an estimate based the Heidelberg annual report, or the industry average IRS data which were found to be consistent). We looked at the information available and determined that the industry average was appropriate.

I don't know how you have determined that Lehigh is the fourth largest facility in the country. I have contacted EPA and based on a 2006 inventory, there are 5 larger kilns, 5 of comparable size (Capacity within 10% of Lehigh) and several plants that have multiple kilns whose aggregate capacity is greater or comparable to that of Lehigh Permanente.

The proposed regulation requires continuous monitoring of all emission points from the kiln, just as is required by proposed NESHAP. Due to the economic reality of 32 sets of CEMS, Lehigh initially proposed a 300 foot single stack (as provided for the AB 2588 Health Risk Assessment 2013 scenario), but since the workshop, they have determined that they may need construct more than one stack, and that it may not be 300 feet tall. We have modified the language to provide some flexibility, but the proposed rule still requires monitoring of all emission points, and that a health risk assessment be performed (based on maximum capacity) for the final stack configuration to show that emissions remain below public notification significance levels. It is possible that the facility will construct a single 300 foot stack, or possibly two or three smaller stacks. It is extremely unlikely that the facility can comply with the proposed regulation utilizing the dust collection system in its current configuration of 32 stacks.

We agree that the current geometry of the stacks makes accurate operation of CEMS unlikely. The installation of a CEM must be approved by our office, and procedures consistent with EPA procedures have been developed by our Technical staff for locating CEMS in relationship to stack flows. Any monitoring equipment installed by Lehigh will have to meet this procedure.

Robert Cave

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(415) 749-5048

From: Gary Latshaw [mailto:glatshaw@gmail.com]
Sent: Monday, August 20, 2012 8:03 AM
To: Robert Cave
Subject: Fwd: Comments on the July 12th Report

Mr. Cave - I understand you are back in the office. I am sure you have many emails that have piled up.

However, could you please respond to this one, which was originally sent two weeks ago.

Thanks, Gary

Mr. Cave - I have a couple of comments on the report.

Primarily I would like to comment about the applicability of using the "$Cost/yr" coefficients in assigning social economic cost to the emissions from the plant. The modeling performed for the Clean Air Plan 2010 did assign a modification to the emissions sources that would be uniform and area wide. So in this sense, my calculations are not directly applicable. However, in the absence of alternative mechanisms to make the social-economic cost calculation, I had to make that approximation. Although that adds an error to the estimate, I don't see a particular bias. The wind rose in the AMEC report shows the wind primarily will draw the air pollution from the plant into a heavily populated area. Since it operates all night I would assume with the inversion layer the emissions are spread out over the entire Santa Clara Valley.

In your July report you acknowledge that the cost of reducing the NOx emissions to NSPS levels would cost an additional $7,573/ton of NOx. You state that although "District rules to reduce NOx typically range between 7 to 20 thousand dollars per ton of NOx", your report states a concern about the social economic impact as described in the BAE report. That report relies critically on the profitability of the Lehigh Plant being 6.5%, the industry average. However, without information on the operation of the Lehigh Cupertino plant I don't see that that is a reliable assumption. The plant is the fourth largest in the country and I would assume would offer economies of scale. Also, such a large producer usually has substantial more pricing flexibiliity than other producers.

On that basis, I ask that you sincerely study imposing more protective regulations on NOx as well as the other pollutants. However, it is analyzed, the social economic costs from the plant air emissions are substantial. A concerned neighbor, Richard Adler, who has been out of town most of the time since your report was released, has had discussions with the National EPA. In those discussions they concluded annual social economic costs in the 100-200 million dollar range. About a factor of four greater than my calculations.

A neighbor sent me a report by a retired field investigator, Dr. Neil Carman, who has spent years inspecting plants such as Lehigh. I have attached that report for your review. He states that the complex geometry of the air flows in the ducts to the stacks of the bag house make an accurate determination of emission levels impossible. For a CEMS to work accurately both the air flow rate and pollutant concentrations must be known. He argues that the complex geometry makes determination of them impossible. He also states that monitoring all the stacks is essential.

I am appreciative that BAAQMD has taken a more protective stance on TACs ahead of EPA timelines, and have been more protective in some other areas. The CEMS monitors for NOx, SO2, and mercury are available from your information office. The data appear to confirm that mercury emissions are down from pervious levels.

Thanks for your assistance in clarifying various aspects of the July report promptly and clearly.

Sincerely, Gary

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Fight for Renewable Energies! Save the global ecology; create jobs; eliminate dependence on foreign oil; reduce military requirements

Gary Latshaw, Ph.D.
408-499-3006

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Fight for Renewable Energies! Save the global ecology; create jobs; eliminate dependence on foreign oil; reduce military requirements

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408-499-3006

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Fight for Renewable Energies! Save the global ecology; create jobs; eliminate dependence on foreign oil; reduce military requirements

Gary Latshaw, Ph.D.
408-499-3006

Statement from Dr. Neil Carman, September 4, 2009, via e-mail:

"I am a former regional field investigator inspecting industrial plants including Portland cement kilns for the State of Texas air pollution control agency from 1980 to 1992. During my time as an investigator, I climbed many cement kiln stacks in order to either conduct stack sampling or to observe contractors conducting stack testing and taking samples of the kiln exhaust.

The Portland cement kilns I inspected each had a single central exhaust stack that collected the gaseous process waste stream and some of the particulate process emissions from the kiln into one place. The stacks for the Portland cement kilns were required to be approximately 150' high or more in order to comply with the various stack testing requirements in the EPA's applicable reference methods and to obtain an accurate reading of the process emissions. Process waste gas flow patterns are more efficiently handled in a single exhaust stack of minimum required height designed to minimize the variability of air flows through bends and turns in the waste gas exhaust duct system. Even by minimizing this variability, it's still necessary to take velocity traverse measurements across the stack diameter every few inches from wall to wall and collect gaseous/particulate stack samples at representative traverse locations across the entire stack diameter including a set of perpendicular traverses. In addition, three identical stack sampling runs at the same process production rates in a facility such as a cement plant are required for compliance purposes in order to obtain adequate readings for higher accuracy to take to account all the variability factors that transpire on each stack sampling run. Valid stack samples need to be verified by whether they were within the required isokinetic sampling requirements that validate if the sampling rates at each traverse location were within the limits allowed between 90% - 110% isokinetic. Even then, no two stack sampling runs are identical despite efforts to minimize and address the multiple sources of variability. Stack samples were collected utilizing 15-20 foot long stainless steel probes and often with a pyrex glass liner inside.

When I zoomed down at the Lehigh Southwest Cement Company plant on the Google Earth satellite map, I was surprised to observe that there is no central exhaust stack which collects the kiln's waste gases and particulate matter emissions. Instead one can see that there is a baghouse with 32 separate waste gas exhaust vents. In my opinion, this makes it quite difficult to nearly impossible to adequately monitor 100% of the kiln's gaseous and particulate matter emissions and take representative samples from 32 separate vents. According to the technical information conveyed to me indirectly from a Mr. Brian Bateman at the BAAQMD in San Francisco, I learned that the BAAQMD extrapolates the total emissions from the kiln with the only CEMS it currently has for NOx, SO2 and other CEMS on a single vent to all the 30 vents that are in operation at one time. The air district in an email claimed that all the vents are supposed to be identical in size, design, process flow and operation. However, I find this claim challenging, in my opinion, because the large number of baghouse vents would likely have subtle operational differences over time due to several sources of variability such as differential wear and tear in the bags themselves differentially increasing the flow rate in one or more vents compared to others with less wear and tear in the bags (no two bags are absolutely identical as they undergo wear and tear over time), and therefore the potential sources of

variability within the 30 different baghouse vents makes any such claim not credible nor supportable.

There could be various configurations inside the baghouse (a primitive method at best for reducing air emissions) in which the air moves from the two separate pipe/ducts which bring the emissions into the bag house. Whatever the particular configuration it is not possible that the air moves at the same rate and at the same distance from the intake pipes to each of the 32 separate vents.

In addition, at any time, there will be differences in the amount of dust in each bag and thus the amount and particulars of the emissions from any of the 32 vents, or 30 vents which are used at one time while the other two have their bags shaken or changed.

In order to comply with the provisions of the Proposed Rule (which I support) for a CEMS to monitor the emissions from a central stack which collects all the emissions together from the bag house and in order to place scrubbers to reduce emissions, a single central stack is necessary. Playing around with 30 individual vents as if there would be any adequate way to monitor the emissions and reduce them in the case of scrubbers and other such technology would not only be inadequate and inaccurate, but the supportable calibration of the CEMS could not be efficiently conducted as required. The vents do not appear to be large enough to place all the CEMS's sample lines and presents a series of technical challenges that a single kiln exhaust stack is better designed to deal with than a system of 32 process vents. Atmospheric dispersion from 30 process vents at low heights also reduces the way the particulate matter and waste gases are dispersed in the area, and one potential outcome is higher ground level impacts of the dust emissions and the waste gases in the plant area.

The three kilns which do not have a central stack need to be required to have one to implement the rule. It is amazing to me that these three kilns have gotten a pass on this and been allowed to operate in this unsupportable manner for all these years."

Robert Cave

From: Joel Masser <joelmasser@hotmail.com>
Sent: Thursday, August 09, 2012 12:14 PM
To: Robert Cave
Subject: Cement Plant Regulations

August 9, 2012

To the Directors of the Bay Area Air Quality Management District Board:

The new regulations for Cement Plants need to protect public health and our environment above protecting profits. Lehigh Southwest Cement Plant is a large cement plant in a major population center. We need strong rules. Besides being the right thing to do, it is economically the soundest thing to do. The economic benefit of the plant to our local economy does not compensate for the health costs.

At a bare minimum,

1. The regulations must require restoration of a single stack.
2. The regulations must require an emission limit for sulfur dioxide (SO2).
3. The regulations must require more protective emission limit on particulates (PM).
4. The regulations must require a more protective emission limit on mercury.

But the more stringent, the better.

Sincerely,
Joel Masser
5327 Romford Drive
San Jose, CA 95124

August 9, 2012

Attention: Supervisor John Gioia, Board Chair
Bay Area Air Quality Management District
939 Ellis St.
San Francisco, CA 94109

Dear Bay Area Air Quality Management District (BAAQMD) Board of Directors,

I am aware that the Bay Area Air Quality Management District will publish the cement plant emissions regulations. These regulations need to impose the most protective and at the same time feasible regulations. Lehigh Southwest Cement Plant, one of the largest cement plants in the U.S., is located directly adjacent to Silicon Valley, one of our State's key economic engines as well as a major population center. According to the July 2012 BAAQMD staff report, Lehigh is one of the few cement plants in the country located in an urbanized area. Pollution from Lehigh is carried by the prevailing winds throughout Silicon Valley.

Annual health costs from the cement plant pollution are estimated in the tens of millions of dollars. These costs have been estimated from both BAAQMD and EPA publications.

The effects of pollution on our health are much more expensive than the cost of reducing the pollution. According to the United States Environmental Protection Agency (EPA), mercury can damage children's developing brains, and particle pollution is linked to a wide variety of serious health effects, including aggravated asthma, irregular heartbeat, heart attacks, and premature death in people with heart and lung disease.

I agree with the Santa Clara County Medical Association which supports the requirement of a central stack to provide for the best conditions to establish continuous and accurate emission monitoring. I also agree with the Cupertino City Council and the Los Altos City Council which both request that BAAQMD adopt the EPA's more protective new source performance standards for new and modified existing cement plants.

1. The regulations must require restoration of a single stack.
2. The regulations must require an emission limit for sulfur dioxide (SO_2).
3. The regulations must require more protective emission limit on particulates (PM).
4. The regulations must require a more protective emission limit on mercury.

The stakes are high for our State's economic security. We need to protect the health of our community and continue to attract the most innovative high-tech workforce to Silicon Valley. More protective regulations are appropriate for one of the largest cement plants cement plants in the U.S. which is close to a large metropolitan area. Please safeguard the health of the public. Thank you very much.

Sincerely,

Hermann von Drateln
1613 S Wolfe Road
Sunnyvale, CA 94087

August 9, 2012

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Bay Area Air Quality Management District
939 Ellis St.
San Francisco, CA 94109

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Sincerely,

Carmen Goodrich
1613 S Wolfe Road
Sunnyvale, CA 94087

August 9, 2012

Attention: Supervisor John Gioia, Board Chair
Bay Area Air Quality Management District
939 Ellis St.
San Francisco, CA 94109

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Sincerely,

Melba von Drateln
1613 S Wolfe Road
Sunnyvale, CA 94087

SCCMA Santa Clara County Medical Association

700 Empey Way, San Jose, CA 95128
(408) 998-8850 FAX (408) 289-1064

September 2, 2009

To Whom It May Concern at the EPA:

On behalf of the members of Santa Clara County Medical Association and the Environmental Health Committee, we support the referenced proposal (Docket ID NO. EPA-HQ-OAR-2002-0051) to improve regulation of cement kiln emissions.

Santa Clara County is home to the Lehigh Southwest cement plant in Cupertino, CA, one of the nation's largest emitters of mercury and other hazardous air pollutants. We believe that there should be no exemptions for those plants that burn high-mercury limestone. As stated by EPA's own consultants, standardized regulation of cement plant emissions will result in drastic cost savings stemming from a decrease in health-related morbidity and mortality. This regulation is estimated to result in 620-1600 avoided deaths per year, with a cost savings between $4.4 to $11 billion.

In addition, the Lehigh plant in our county is one of a handful of cement plants that does not have a central stack, making monitoring of emissions difficult, if not impossible. We support the requirement of a central stack to ensure proper monitoring and compliance with EPA regulations.

Sincerely,

William C. Parrish, Jr

William C. Parrish, Jr
SCCMA CEO

WCP/jbc

SCCMA Santa Clara County Medical Association

700 Empey Way, San Jose, CA 95128
(408) 998-8850 FAX (408) 289-1064

February 1, 2011

To the Board of Supervisors of Santa Clara County:

The Honorable Dave Cortese, District 3
The Honorable Mike Wasserman, District 1
The Honorable George Shirakawa, District 2
The Honorable Ken Yeager, District 4
The Honorable Liz Kniss, District 5

The Santa Clara County Medical Association (SCCMA) recognizes the potential negative impact on public health due to cement plant operations which contribute to global warming and emit a variety of toxic pollutants into the air with direct exposure to the population and the environment of our County. We also recognize that the Lehigh cement plant is the fourth largest emitter of mercury, a potent neurotoxin, from cement plants in the United States. The SCCMA asks that all current violations of the Cupertino site of the Lehigh Southwest Cement Company, including mining operations, be corrected and that as long as the plant operates, new EPA standards for mercury, hydrochloric acid, total particulate matter, and total hydrocarbons be implemented and directly monitored where emitted into the air via a single stack. We also ask that any future violations noted be promptly corrected as a condition of all permits granted.

We ask for full enforcement of the laws and regulations to protect public and environmental health in this region. We are opposed to expansion of any polluting activity in a densely populated area that poses a risk to public health. We support smart and sustainable development with minimal impact on residents or the environment.

In line with the policy of the California Medical Association, if operation and development is allowed, then the plant should conform to pollution limits in line with new EPA rules for cement plants. Any existing cement plant should conform to new EPA limits for mercury at 43 lb/million tons of clinker for existing sources. For any expansion of existing cement plants or new development of cement plants, the plant should use best management practices and conform to the new EPA limit of 14 lb/million tons of clinker. Strict monitoring and enforcement will be necessary for the safety of the surrounding residents.

Societal costs of pollution are immense on an individual and global perspective. It is our goal to support and promote the health and well being of our entire population in Santa Clara County, which not only improves lives but is also cost effective for all of us in the long run.

Respectfully submitted,

Cindy Lee Russell, M.D.
Chair, Environmental Health Committee
Santa Clara County Medical Association

Bill Parrish, CEO
Santa Clara County Medical Association

August 10, 2012

Supervisor John Gioia, Board Chair and
Bay Area Air Quality Management District Board of Directors
Bay Area Air Quality Management District
939 Ellis St.
San Francisco, CA 94109

Dear Bay Area Air Quality Management District Board of Directors,

I am aware that the Bay Area Air Quality Management District (BAAQMD) will publish the cement plant emissions regulations. These regulations need to impose the most protective and at the same time feasible regulations. Lehigh Southwest Cement Plant, one of the largest cement plants in the U.S., is located directly adjacent to Silicon Valley, one of our State's key economic engines as well as a major population center. According to the July 2012 BAAQMD staff report, Lehigh is one of the few cement plants in the country located in an urbanized area. Pollution from Lehigh is carried by the prevailing winds throughout Silicon Valley. According to the United States Environmental Protection Agency's Environmental Justice Geographic Assessment Tool, there are about 258,718 people that live within 5 miles from Lehigh.

Annual health costs from the cement plant pollution are estimated in the tens of millions of dollars. These costs have been estimated from both BAAQMD and EPA publications.

The effects of pollution on our health are much more expensive than the cost of reducing the pollution. According to the United States Environmental Protection Agency (EPA), mercury can damage children's developing brains, and particle pollution is linked to a wide variety of serious health effects, including aggravated asthma, irregular heartbeat, heart attacks, and premature death in people with heart and lung disease.

I agree with the Santa Clara County Medical Association which supports the requirement of a central stack to provide for the best conditions to establish continuous and accurate emission monitoring. I also agree with the Cupertino City Council and the Los Altos City Council which both request that BAAQMD adopt the EPA's more protective new source performance standards for new and modified existing cement plants.

1. The regulations must require restoration of a single stack.
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4. The regulations must require a more protective emission limit on mercury.

The stakes are high for our State's economic security. We need to protect the health of our community and continue to attract the most innovative high-tech workforce to Silicon Valley. More protective regulations are appropriate for one of the largest cement plants cement plants in the U.S. which is close to a large metropolitan area. Please safeguard the health of the public. Thank you very much.

Sincerely,

Linda Sell
1478 Lewiston Drive,
Sunnyvale, CA 94087

Robert Cave

From: Barry Chang 4 Cupertino City Council <barry4cupertino@gmail.com>
Sent: Friday, August 10, 2012 5:18 PM
To: Robert Cave; Regulation Change
Subject: Comment on proposed Regulation 9, Rule 13

Hi Robert,

Bay Area air Quality Management District (BAAQMD) issued another spare the air day yesterday again. Bay Area air quality is not meeting State and Federal clean air requirements. Regarding the proposed Regulation 9, Rule 13, BAAQMD shall set the regulations to protect more than 7.2 millions people who live or work in San Francisco Bay region. Thank you very much.

Barry Chang, Chair of the Board
Bay Area for Clean Environment

--
Barry Chang
Cupertino City Councilmember
www.barry4cupertino.com
barry4cupertino@gmail.com
408-688-6398

Lehigh Hanson
HEIDELBERGCEMENT Group

Lehigh Hanson
300 E. John Carpenter Freeway
Irving, TX 75062
Phone (972) 653-3787
Mobile (469) 834-7349
Fax (972) 819-1702

August 30, 2012

VIA: Electronic Submission: Email: *rcave@baaqmd.gov*

Mr. Robert Cave
Air Quality Specialist
Bay Area Air Quality management District
939 Ellis Street
San Francisco, Ca. 94109

Subject: **Comments on the Bay Area Air Quality Management District's Proposed Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter And Toxic Air Contaminants from Portland Cement Manufacturing.**

Dear Mr. Cave:

Lehigh Southwest Cement Company LLC (Lehigh) respectfully submits these comments on the above referenced Bay Area Air Quality Management District's (District) July 20, 2012 public hearing notice of proposed rulemaking. Lehigh is committed to outstanding environmental stewardship and welcomes the opportunity to continue working with the District after the close of the comment period to ensure that the regulation is fair, balanced and—most importantly—achievable.

I. Background

Lehigh and its sister companies operate twelve cement plants in eight states around the country. Lehigh operates the Permanente plant, and the facility has been manufacturing cement products at the Cupertino site since 1939. Today it employs over 150 people and supplies much needed locally produced cement to the Bay area and Santa Clara County. As you know, the Permanente manufacturing plant is the only cement plant in the BAAQMD district, California and the United States that would be affected by the proposed rulemaking.

The following is a summary of Lehigh's comments to this new rulemaking, and more detailed comments are provided after the summary below:

1. Lehigh believes that the District's proposed regulation will place the Permanente plant at a competitive disadvantage to other plants in California as well as to plants around the country and to potential imports. This is especially true if the U.S. EPA's NESHAP reconsideration proposal which is to be finalized by December 20, 2012 and retains such proposed changes such as a 2 year compliance extension to September 2015, increases the Particulate Matter standard from 0.04 to 0.07 lbs/ton of clinker and monitoring requirements which differ from the District's proposal.

2. Lehigh opposes two other of the District's proposed emission standards namely the PM standard for clinker coolers and the dioxin/furan limit.

3. The District needs to allow us adequate time in order to install a new single stack. This cannot be accomplished in the allotted timeframe set out in this proposed rule.

4. Lehigh supports the District's proposal to increase the Total Hydrocarbon Standard's organic HAP standard to 12 ppmv to coincide with the EPA's NESHAP standard and to allow for both options as allowed in the NESHAP rule; i.e. the 24ppmv THC standard.

5. The BAAQMD has not demonstrated the need or a regulatory requirement to establish these more stringent emission standards, which are being imposed on the Permanente facility. It appears the BAAQMD is arbitrarily setting these limits and what procedure / policy have been followed to establish these more stringent emission standards.

II. Proposed Regulation 9-13 is Arbitrary, Capricious, and Without Reasonable or Rational Basis.

Proposed Regulation 9-13 is arbitrary, capricious, and without reasonable or rational basis under California law because the standards therein cannot be achieved by the September 9, 2013 compliance date. *See Am. Coatings Assoc., Inc. v. S. Coast Air Quality Dist.*, 54 Cal. 4th 446, 460 (2012) (considering whether new emissions limits were actually achievable in determining whether such limits were arbitrary, capricious, or without reasonable or rational basis). As set forth by the EPA proposed rules regarding National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants ("2012 EPA Proposed Rules"), cement plants cannot practicably implement heightened PM standards earlier than September 2015. 77 FR 42368-01, 2012 WL 2904751. There is no basis in the record for concluding that EPA is wrong and that a compliance date two years sooner is practicable. Attached hereto as Exhibits A to C are the 2012 EPA Proposed Rules and relevant technical documents relied upon by the EPA.

a. The PM Standard Set Forth by Proposed Regulation 9-13 is Excessively Restrictive.

Proposed Regulation 9-13 and the EPA Proposed Rules each implement stricter PM standards. But Proposed Regulation 9-13 sets forth PM standards that are more restrictive, and thereby more difficult to attain, than those in the 2012 EPA Proposed Rules – Proposed Regulation 9-13

limits PM emissions to .04 lb/ton clinker, while the 2012 EPA Proposed Rules limit PM emissions to .07 lb/ton clinker.

Although the EPA's 2010 National Emission Standards for Hazardous Air Pollutants set forth a .04 lb/ton clinker limit, those standards were remanded by the reviewing court in *Portland Cement Assoc. v. Environmental Protection Agency*, 665 F.3d 177 (D.C. Cir. 2011).

The EPA has since acknowledged that a .04 lb/ton clinker PM limit is inappropriate. As set forth by the EPA, the less restrictive .07 lb/ton clinker PM limit in the 2012 EPA Proposed Rules provides "flexibility for those days when emissions increase as a result of normal operating variability, [without] significantly [altering] long-term average performance for PM." 77 FR 42368-01, 2012 WL 2904751 at *42389.

b. The September 9, 2013 Compliance Date Set Forth by Proposed Regulation 9-13 is Not Achievable.

Further, as to the PM standards set forth by the 2012 EPA Proposed Rules, the EPA considered an exhaustive record, including technical documentation and extensive commentary from the industry, on the issue of the earliest possible compliance date. The EPA concluded that September 9, 2015 is the earliest practicable date that the 04 lb/ton clinker PM limit could practicably be implemented: "We [EPA] believe that [the September 9, 2015 date] would require compliance "***as expeditiously as practicable***" as required by section 112 (i)(3)(A) of the [Clean Air Act]." 2012 EPA Proposed Rules, 77 FR 42368-01, 2012 WL 2904751 at *42385 (emphasis added). If compliance by September 9, 2015 is as expeditiously as practicable, the BAAQMD's acceleration of the compliance date by two years is arbitrary and capricious.

The 2012 EPA Proposed Rules explain in detail why complying with the new PM standards is challenging for cement companies. In particular, the EPA anticipated that compliance will require the most advanced technologies – "the most advanced fabric filters, membrane bags, frequent bag replacement and maintenance." 2012 EPA Proposed Rules, 77 FR 42368-01, 2012 WL 2904751 at *42386. Moreover, compliance strategies for PM have implications for and interdependence with other pollutant control strategies and therefore stricter PM standards will require cement plants to reassess all of their pollutant control strategies. *Id.* ("The proposal to amend the standard for PM has implications for all of the standards, not just those for PM… A change in the PM standard thus affects these collateral PM control strategies as well."). Therefore, the EPA concluded that cement plants such as Lehigh, need 15 to 27 months, at a minimum, to meet the new PM standards:

> New compliance strategies require time to implement. New engineering studies are needed, potential suppliers identified, and a new bidding/procurement process undertaken. Significant plant redesign, in the form of new ductwork and new fan design, and changes in the main control equipment may be needed. Depending on the type of control, this normally requires 15-27 months. Multiple control systems will take longer. Installation of controls at cement kilns normally occurs during winter months (to coincide with kiln outages during low production seasons).
> *Id.* (citations omitted).

And the EPA is not alone in reaching this conclusion. It is well established in the cement industry that heightened PM standards simply are not achievable by September 2013. Attached hereto as Exhibits D to O are comments submitted by organizations in the cement industry setting forth the technical basis for EPA's determining the impracticability of achieving heightened PM standards by September 2013.

Proposed Regulation 9-13 not only imposes a more restrictive standard than EPA found appropriate, but it also establishes a compliance deadline two years earlier. Accordingly, on the basis that the September 9, 2013 compliance date set forth by Proposed Regulation 9-13 is arbitrary, capricious, and without reasonable or rational basis, the regulation must be changed to reflect a September 2015 compliance date.

III. Proposed Regulation 9-13 Only Intends to Set Forth Limits for Lehigh's Permanente Facility, and Therefore It Violates California Law Requiring that Regulations be Generally Applicable.

BAAQMD only targets Lehigh with the standards in Proposed Regulation 9-13. The entire analysis of the BAAQMD's July 2012 Staff Report is focused upon Lehigh. As set forth by the Staff Report, the "District is considering adoption of Regulation 9, Rule 13 to achieve the maximum feasible, cost effective emissions reductions of NOx and PM in concert with efforts to bring the ***Lehigh facility*** into compliance." Staff Report, p. 4 (emphasis added).

However, because the proposed pollution standards only apply to Lehigh, they do not qualify as a "regulation." "Regulations, by definition, are rules, orders, and standards of ***general application*** that "implement, interpret, or make specific" the statutory law." *Health Net of Cal., Inc. v. Dep't of Health Servs.*, 113 Cal.App.4th 224, 235 (2003) (emphasis added); *see also Sherwin-Williams Co. v. S. Coast Air Quality Mgmt. Dist.*, 86 Cal.App.4th 1258, 1283 (2001).

Further, under California law "regulations" are subject to an extremely deferential standard of review. *See Am. Coatings Assoc., Inc. v. S. Coast Air Quality Dist.* 54 Cal. 4th 446, 460 (2012) (in assessing the validity of a quasi-legislative regulation, a court's inquiry is "confined to the question whether the classification is "arbitrary, capricious, or [without] reasonable or rational basis.""). By improperly classifying the proposed pollution standards as a "regulation," the BAAQMD has wrongly limited Lehigh's ability to seek judicial review.

Air districts, such as the BAAQMD, also have authority to limit pollutant emissions by issuing permits. Permits are the proper means by which to limit emissions from an individual facility. Further, the denial of a permit is subject to a more appropriate level of judicial review. If an air district enters a decision denying or revoking a permit, California courts are not limited to the "arbitrary, capricious, or without reasonable or rational basis" standard of review. Rather, they have authority to review both the law and the evidence that the air district considered. *See Hardesty v. Sacramento Metropolitan Air Quality Mgmt. Dist.*, 202 Cal.App.4th 404, 414 (2011) ("If the decision of an administrative agency substantially affects a 'fundamental vested right,' the trial court must not only examine the administrative record for errors of law, but also must

exercise its independent judgment upon the evidence. However, when the administrative decision neither involves nor substantially affects such a right, the trial court must review the entire administrative record to determine whether the findings are supported by substantial evidence and if the agency committed any errors of law.").

Accordingly, the BAAQMD cannot impose new limits on the Lehigh Permanente plant in the guise of a regulation, thereby limiting Lehigh's legal remedies.

IV. Competitive Disadvantage

Due to the District's effective date of September 9, 2013, we believe this will result in a significant competitive disadvantage for the Permanente facility. The facility will be required to spend large amounts of capital (up to $20 million), increase our daily operating costs and increase our GHG footprint, while our competitors including importers do nothing. In these difficult economic times, which are not improving, it is over burdensome to this facility to impose these requirements only on this facility.

The higher capital requirement is due to the lower dust emission imposed by this regulation vs the NESHAP (PM standard 0.04 vs 0.07 lbs/ton clinker). This requires the baghouse to be replaced vs modifying the existing dust collector. We request the District to mirror the proposed NESHAP reconsideration standard of 0.07 lbs/ton clinker.

V. Other Proposed Emission Standards

We request that the District change the dioxin/furan limit to 0.2 ng/dscm (TEQ) or 0.4 ng/dscm (TEQ) if dust collector inlet temperature during the performance test is below 400oF, to be consistent with federal NESHAP, which has been in place for many years and is not part of the recent NESHAP revisions.

IV. Stack Requirements Effective Date

Lehigh is committed to installing a single stack at this facility. In fact, we have been diligently working on this issue for over a year. We have performed preliminary design work, we have begun review for a location and we have done other engineering work. However, we are very concerned in being able to meet the proposed rule's deadline for installation of September 9, 2013. The District expects to finalize the rule prior to the end of 2012, which will yield less than 12 months to implement required compliance controls and equipment and the installation of the new stack.

Lehigh's experience for new construction activities and previous permitting activities in Santa Clara County indicate a 36 month compliance schedule is required to meet this regulation and the new stack. We believe the compliance date of September 9, 2013 is not possible due to the many unknown permitting issues.

Per the regulation:

> **9-13-303** **Stack Requirements:** Effective September 9, 2013, no person shall operate a Portland cement manufacturing facility unless emissions from the kiln are monitored as per Section 9-13-501 and enter the atmosphere from a point or points that, at maximum potential to emit, or maximum permitted emission level, when combined with other facility emissions, have been demonstrated not to exceed the notification threshold established under Air Toxics "Hot Spots" Information and Assessment Act requirements as codified in California Health and Safety Code Section 44300 et al. and the Districts' Air Toxics Hot Spots program.

Lehigh's Permanente kiln is vented through a dust collector where each dust collector compartment (32) maintains a short stack. These short stacks are not manifolded together. In order to comply with the 9-13-303, Lehigh believes a single stack will be required to be permitted, designed and constructed that will 1) allow all the emissions to be monitored from the kiln and 2) to ensure compliance with maximum potential to emit standards. This stack will be between 200 to 400 feet tall and will be a free standing stack.

Due to the height and visual impact of the stack, Lehigh is concerned that the project could result in a California Environmental Quality Act (CEQA) analysis. We support the District's adoption of a Negative Declaration pursuant to CEQA. As stated above, our experience in permitting other construction activities with the Santa Clara County Codes need to be examined and possible impacts need to be address.

Due to the height of the stack and the location of numerous airports within the area, FAA approval will most likely be required.

In order to permit, design and construct a stack the following tasks have been identified and estimated timelines have been developed.

Task	Time Required	Timeline	
		Beginning (month)	Ending (month)
Obtain consultant to perform modeling	1 month	0	1
Locate stack	1 month	0	1
Develop model criteria (maximum conditions)	1 month	1	2
Agree with BAAQMD on modeling criteria	1 month	2	3
Perform modeling	1 month	3	4
Meet with BAAQMD to discuss results	1 month	4	5
Re-model as required and prepare final report	1 month	5	6
BAAQMD approve Model	2 months	6	8
Prepare CEQA review	2 months	8	10
Design stack and foundations	2 months	10	12
Submit and achieve CEQA approval	9 months	10	19
Prepare, Submit and Obtain County Approval	9 months	10	19
Prepare, Submit and Obtain FAA Approval	9 months	10	19
Manufacture Stack	6 months	19	25
Construction Foundations	6 months	19	25
Erection of Stack	6 months	25	31
Connection to Process	1 month	31	32
Verify CEM Performance (Troubleshoot)	2 months	32	34
RATA CEMs	2 months	34	36

V. Administrative Requirements (9-13-400)

Lehigh requests that the District change the Hg and HCL source test frequency from initial and annual to initial and every 30 months to coincide in the source test frequency for organic HAPs in the proposed rule. The plant currently has a Hg CEM.

Lehigh requests that the parametric monitoring requirements for Hg, HCL and THC be developed prior to initial source tests, based on submitting a plan to the District 60 days prior to the source test.

Lehigh's has a concern with the HCl limit for a kiln with an in-line raw mill, which is this plant's configuration. Given that HCl concentrations at the raw mill on condition are likely to be 25% or less of the concentrations at the raw mill off condition, implying that, for the average HCl concentration to be below the limit (assuming 70% raw mill on), the concentration at raw mill on has to be below 0.5 ppm or less, which is below the detection limit as specified by EPA. Therefore, the HCl limit as written cannot be directly applied to kilns with in-line raw mills, and an alternative approach will be needed. Lehigh will propose this alternate approach based on submitting plan to BAAQMD 60 days prior to source test.

VI. Other Specific Comments

304.7 7.3: Lehigh requests that the District add "except for wet/raining conditions".
304.8: Lehigh enforces some of these provisions but believes that this is a personnel function and should not be included in a Rule.

304.10: Lehigh believes that it would be better to have inspections on material surface moisture like our rock plant than as described herein.

Lehigh appreciates the opportunity to provide comments to this proposed rulemaking and will continue to work with the District on this rulemaking and others affecting this facility. If you have any questions, please contact me at (972) 653-3787.

Respectfully submitted,

Timothy L. Matz
Corporate Director of Environmental Affairs
Lehigh Hanson, Inc.

Cc. Alan Sabawi, Plant Manager
Scott Renfrew, Plant Environmental manager

Encls.

Hello Tim,

It would be helpful if you could give us an update on where you stand with your comments and if you could estimate when you might be able to get them into us. We hope to begin final review of our comments and responses document next week.

Robert Cave
Senior Air Quality Specialist
Rules and Research Division
Bay Area Air Quality Management District
rcave@baaqmd.gov
(415) 749-5048

From: Matz, Tim [mailto:tmatz@htcnam.com]
Sent: Friday, August 03, 2012 9:45 AM
To: Dan Belik; Robert Cave
Cc: Conrads, Axel (San Ramon) USA; Renfrew, Scott (Cupertino) NA
Subject: RE: New Cement Rule Commenting Period

Thanks Dan.

Timothy L. Matz
Corporate Director of Environmental Affairs

Lehigh Hanson
300 East John Carpenter Freeway
Irving, Texas 75062
phone: (972) 653-3787
cell: (469) 834-7349
fax: (972) 653-5693
tmatz@htcnam.com

From: Dan Belik [mailto:DBelik@baaqmd.gov]
Sent: Friday, August 03, 2012 11:33 AM
To: Matz, Tim; Robert Cave
Cc: Conrads, Axel (San Ramon) USA; Renfrew, Scott (Cupertino) NA
Subject: RE: New Cement Rule Commenting Period

Tim,

We request comments on the rule by a date so that we can include written responses in our package that goes to the Board of Directors. For this reason, we set a deadline (usually 21 days from the date of notice). That does not preclude you from sending comments after that date, or submitting written or oral comments anytime up to and at the public hearing. Any comments submitted between the time of noticing and the public hearing are part of the public record and would be included in materials sent to the Board. We would try to include responses to any written comments received

after the comment deadline, but at some point, our executive staff has to have a package to review so that it can be sent to the Board in advance of the hearing. In this case, we noticed the rule a bit earlier than we normally do, because we anticipate a significant volume of comments, so there is some additional time in the noticing period. Consequently, I would ask that you send in comments as soon as you are able, but we will of course make sure that they go to the Board regardless of when received.

Comments on the CEQA initial study and draft negative declaration are required by law within the 21 day period. We could try to respond to comments received specific to this document after this date but are not legally required to enter them into the record – but this only applies to the CEQA document.

Please do not hesitate to call Robert or myself with any questions about the process from this point forward.

Dan

Daniel Belik
Rule Development Manager
Planning, Rules and Research Division
Bay Area Air Quality Management District
939 Ellis Street San Francisco, CA 94109
(415) 749-4786 dbelik@baaqmd.gov

From: Matz, Tim [mailto:tmatz@htcnam.com]
Sent: Friday, August 03, 2012 8:52 AM
To: Robert Cave
Cc: Dan Belik; Conrads, Axel (San Ramon) USA; Renfrew, Scott (Cupertino) NA
Subject: New Cement Rule Commenting Period

Hi Robert,

I noticed on the District's web site for the new cement rule that it had a comment due date of August 10, 2012. On our conference call of July 19, 2012 regarding the rule, my notes mentioned that we would have a 30 day comment period, which would make the due date August 19, 2012. The rule was posted July 20, 2012. Lehigh is currently assembling our comments but we will need the full 30 day period. Can you please confirm that we in fact are entitled to the 30 days and thus the due date is August 19, 2012? I am specifically concerned with the official closing time of the comment period. Is that August 10th or the 19th, 2012? Thank you.

Timothy L. Matz
Corporate Director of Environmental Affairs

Lehigh Hanson
300 East John Carpenter Freeway
Irving, Texas 75062
phone: (972) 653-3787
cell: (469) 834-7349
fax: (972) 653-5693
tmatz@htcnam.com

SCCMA Santa Clara County Medical Association

700 Empey Way, San Jose, CA 95128
(408) 998-8850 FAX (408) 289-1064

September 10, 2012

Supervisor John Gioia
Chairman of the Board
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

To the BAAQMD Board of Directors:

The Santa Clara County Medical Association (SCCMA) recognizes the potential negative impact on public health due to cement plant operations, which contribute to global warming and emit a variety of toxic pollutants into the air with direct exposure to the population and the environment of our county. We also recognize that the Lehigh cement plant emits a substantial amount of mercury, a potent neurotoxin, far above the proposed standards of 55lb/million tons of clinker. The SCCMA asks that all current violations of the Cupertino site of the Lehigh Southwest Cement Company, including mining operations, be corrected, and that as long as the plant operates, new EPA standards for mercury, hydrochloric acid, total particulate matter, and total hydrocarbons be implemented and directly monitored where emitted into the air via a single stack.

The adoption of Regulation 9, Rule 13, while improving the current standards for nitrogen oxide and particulate matter, would not address sulfur dioxide and is not in line with federally proposed National Emissions Standards for Hazardous Air Pollutants (NESHAP) for mercury, which sets the limit at 21 lb/million tons of clinker.

Regardless of whether Lehigh meets the legal definition of a modified existing cement plant, it operates in a densely populated area. The SCCMA thus recommends the adoption of the more stringent NESHAP for new and modified existing plants. Strict monitoring and enforcement will be necessary for the safety of the surrounding residents.

The societal costs of pollution are immense on an individual and global perspective. It is our goal to support and promote the health and well being of our entire population in Santa Clara County, which not only improves lives, but also is cost effective for all of us in the long run.

Sincerely,

William C. Parrish, Jr
William C. Parrish, Jr
SCCMA CEO

Cindy Lee Russell, MD
Cindy Lee Russell, MD
Chair, SCCMA Environmental Health Committee

WCP:slb

Robert Cave

From: Jim Gustafson <JGustafson@losaltosca.gov>
Sent: Monday, September 10, 2012 9:08 AM
To: Robert Cave
Subject: PUBLIC HEARING: PROPOSED NITROGEN & PARTICULATES Rule

Hello Mr. Cave,

We have the notice of the Public Hearing scheduled for September 19, 2012.
Thank you for the opportunity to comment. The City of Los Altos staff has no objection to the rule.
It appears that the measures proposed to be put in place will provide a metric to limit harmful emissions, and that compliance measures will not be unreasonably burdensome.

Jim Gustafson, P.E.
Engineering Services Manager
City of Los Altos

APPENDIX C

SOCIOECOMONIC ANALYSIS

bae urban economics

Socio-Economic Impact Study of the Proposed Bay Area 2012 Clean Air Plan, Control Measure SSM-9, BAAQMD Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing

Submitted to: Bay Area Air Quality Management District

June 4, 2012

bae urban economics

San Francisco
1285 66th Street
Second Floor
Emeryville, CA 94608
510.547.9380

Sacramento
803 2nd Street
Suite A
Davis, CA 95616
530.750.2195

Los Angeles
5405 Wilshire Blvd.
Suite 291
Los Angeles, CA 90036
213.471.2666

Washington DC
1346 U Street NW
Suite 403
Washington, DC 20009
202.588.8945

New York City
121 West 27th Street
Suite 705
New York, NY 10001
212.683.4486

www.bae1.com

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EXECUTIVE SUMMARY

The Bay Area Air Quality Management District (BAAQMD) proposes to enact Regulation 9, Rule 13 (Rule 9-13) to limit nitrogen oxides (NOx), particulate matter (PM), and toxic air contaminants (TACs) from Portland cement manufacturing at the Lehigh Southwest Cement Plant (Lehigh) in Santa Clara County.[1] Until now, emissions from Portland cement plants have not been subject to District requirements specific to this industry. However, manufacturers have been subject to federal regulations under New Source Performance Standards (NSPS) and National Emission Standard for Hazardous Air Pollutants (NESHAP). In addition, California establishments that operate cement kilns, including Portland cement plants, have been subject to Title V operating permits.

The proposed BAAQMD rule would apply specifically to Portland cement plants and include NESHAP regulations as well as additional regulations on NOx emissions from kiln exhaust. If Congress or the Courts overturn the new NESHAP requirements, Bay Area Portland cement plants would still be responsible for compliance under the proposed Rule 9-13. The implementation of Rule 9-13 would potentially reduce NOx emissions by up to two tons per day, as well as reduce secondary fine particulate matter (PM2.5). The rule would take effect September 9, 2013.

Socio-Economic Impacts

In order to estimate the economic impacts of enacting Rule 9-13 on the affected industries, this report compares the affected industry's annualized compliance costs[2] with its 10-year average profit ratio. The analysis uses data from the BAAQMD, US Census County Business Patterns, the US Annual Survey of Manufacturers (2000-2010), the IRS (2000 – 2010), and the 2007 US Economic Census.

Economic Profile of Affected Industry

The BAAQMD identifies the affected industry as Portland Cement Manufacturers (NAICS 327310). According to BAAQMD records, there is one Portland cement manufacturing establishment, Lehigh Cement (Lehigh), in the Bay Area that would be subject to the proposed rule.

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[1] The Lehigh plant is the only Portland cement manufacturing plant in the BAAQMD.

[2] Based on its 10-year average production level

Economic Impacts to Affected Industry

IRS data indicate that between 2000 and 2010, firms in the Portland cement manufacturing sector earned an average 6.5 percent profits on total revenue, resulting in total annual industry net profits of $6.6 million. According to BAAQMD data, the average annualized compliance costs to the Portland cement manufacturing establishment would be approximately $1.2 million for compliance with the District requirements, or $4.0 million for compliance with the District and federal (NESHAP) requirements. Dividing the NESHAP and District compliance costs ($4.0 million) by annual profits ($6.6 million) shows that the proposed Rule would result in a 61 percent reduction in establishment profit. Dividing the District compliance costs ($1.2 million) by annual profits ($6.6 million) shows that the proposed Rule would result in an 18 percent reduction in establishment profit, which is above the California Air Resources Board's (ARB's) 10 percent threshold used to determine a significant cost burden. The ability of Lehigh Cement to pass these costs through to customers is not known.

Regional Employment, Indirect, and Induced Impacts

Since on average, the proposed Rule 9-13 would result in significant economic impacts to establishments within the affected industries, this report analyses the regional employment, indirect and induced impacts should the Lehigh facility choose to close as a response to the projected costs of this proposed rule. A loss of 150 Lehigh employees would generate an additional loss of 469 regional employees, resulting in total regional losses of 619 employees, $60.7 million labor income payments,[3] and $196.3 million in gross regional receipts.

Impacts to Small Businesses

Using the California Government Code 14835's definition of a small business, Lehigh does not qualify as a small business. Thus, the proposed Rule would not adversely impact small businesses.

[3] Includes payments to employee compensation, proprietors' incomes, and payments to independent contractors' incomes.

DESCRIPTION OF PROPOSED RULE

The Bay Area Air Quality Management District (BAAQMD) proposes to enact Regulation 9, Rule 13 (Rule 9-13) to limit nitrogen oxides (NOx), particulate matter (PM), and toxic air contaminants (TACs) from Portland cement manufacturing at the Lehigh Southwest Cement Plant (Lehigh) in Santa Clara County.[4] The rule would take effect September 9, 2013.

Until now, emissions from Portland cement plants have not been subject to District requirements specific to this industry. However, manufacturers have been subject to federal regulations under New Source Performance Standards (NSPS) and National Emission Standard for Hazardous Air Pollutants (NESHAP). In August 2010, the EPA amended both NSPS and NESHAP standards to further reduce criteria and TAC emissions from Portland cement manufacturing operations. New NSPS standards regulate NOx, SO2, and PM emissions from facilities constructed, modified, or reconstructed after June 2008 and requires continuous emission monitoring, while the new NESHAP standards limit PM, dioxin/furan emissions, total hydrocarbons, mercury, hydrochloric acid (HCl), and metallic hazardous air pollutants from new and existing kilns. Because Lehigh's facility has not been modified since 2008, it is not subject to new NSPS requirements, but is subject to the amended NESHAP requirements for existing kilns.

Currently, federal NESHAP amendments are under fire from two sources. Cement manufacturing companies and the national industry association have filed litigation challenging the legality of the new standards. The US House of Representatives and the US Senate have also introduced new legislation (HR 2681 and S 1610, Cement Sector Regulatory Relief Act of 2011) to provide a legislative stay of the new EPA emissions standards. A decision reached in the lawsuit (Portland Cement Association vs. Environmental Protection Agency and Lisa Perez Jackson) on December 11, 2011 remanded the NESHAP for reconsideration but did not stay the effect of the rule. On April 16, 2012, a settlement agreement was filed with the US Circuit Court of Appeals, and as per that settlement, on June 22, 2012, EPA proposed revisions to the rules including a two year delay in the compliance deadline, and slight changes to the emissions standards for PM and Organic HAPs.

At the state level, establishments that operate cement kilns, including Portland cement plants, have been subject to Title V operating permits. Title V of the federal Clean Air Act as amended in 1990 require major facility emitters to obtain operating permits from the State and/or local

[4] The Lehigh plant is the only Portland cement manufacturing plant in the BAAQMD.

air district in which it operates. California delegates this permitting process to the local air districts. Thus, Lehigh is subject to BAAQMD Regulation 2, Rule 6 (Rule 2-6): Permits, Major Facility Review, which incorporates the applicable NESHAP, NSPS, and District regulations. However, according to the BAAQMD Rule 9-13 Workshop Report, there are currently no state or district rules "that specifically regulate cement manufacturers, other than greenhouse gas emissions reporting requirements and those rules governing the use of scrap tires as fuel."[5]

Aside from Title V permitting under Rule 2-6, the BAAQMD regulates cement plants through general governing of permits (Rule 2-1 and Rule 2-2), emissions of toxic or hazardous compounds (Rule 2-5), and some general or miscellaneous regulations for individual pollutants (Rule 6-1, Rule 8-2, Rule 9-1, and Rule 11-1).[6] The proposed BAAQMD rule would apply specifically to Portland cement plants and include NESHAP regulations as well as additional regulations on NOx emissions from kiln exhaust. The implementation of Rule 9-13 would potentially reduce NOx emissions by up to two tons per day, as well as reduce secondary fine particulate matter (PM2.5). Table 1 shows the proposed emissions limits under Rule 9-13.

In addition to the emissions limits in Table 1, proposed Rule 9-13 would require the modification to the emissions point such that when operating at full permitted capacity, pollutants are dispersed to the extent that notification to residents under the District's AB2588 (Air Toxics Health Risk Information and Assessment Act) program would not be required. A Health Risk Assessment performed in conjunction with the design process would be required for confirmation as part of the rule requirements.

Finally, elements of Lehigh's Dust Management Plan that is part of their Title V permit have been incorporated into the proposed rule. This Dust Management Plan is already in effect at the facility.

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[5] BAAQMD. BAAQMD Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing, Workshop Report. November 2011. Page 8.

[6] BAAQMD. BAAQMD Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing, Workshop Report. November 2011. Page 8.

Table 1: Proposed Emissions Limits, Regulation 9, Rule 13

Operation	Emissions Limits	
Portland Cement Manufacturing Kilns		
NOx per ton of clinker produced	2.3	pounds, averaged over 30 days
PM per ton of clinker produced	0.04	pounds
Ammonia	10	ppmv above baseline, dry at 7% oxygen averaged over 24 hours.
Toxic Air Contaminants (TACs)		
Dioxins/Furans (TEQ)	0.2	nanograms per standard cubic meter, dry at 7% oxygen averaged over 24 hours.
Mercury	55	pounds per million tons of clinker produced, averaged over 30 days
Total Organic HAP	12	ppmv, dry at 7% oxygen averaged over 30 days
HCl	3	ppmv, dry at 7% oxygen averaged over 30 days
Opacity Standard	10%	lasting no more than three minutes in any one hour period

Sources: BAAQMD; BAE, 2011.

REGIONAL TRENDS

This section provides background information on the demographic and economic trends for the San Francisco Bay Area, which represents the BAAQMD's District. The San Francisco Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. Regional trends are compared to statewide demographic and economic patterns since 2000, in order to show the region's unique characteristics relative to the State.

Regional Demographic Trends

Table 2 shows the population and household trends for the nine county Bay Area and California between 2000 and 2010. During this time, the Bay Area's population increased by 5.4 percent, compared to 10 percent in California. Likewise, the number of Bay Area households grew by 5.8 percent, compared to a 9.3 percent statewide increase.

Table 2: Population and Household Trends, 2000-2010

Bay Area (a)	2000	2010	Total Change 2000-2010	Percent Change 2000-2010
Population	6,784,348	7,150,739	366,391	5.4%
Households	2,466,020	2,608,023	142,003	5.8%
Average Household Size	2.7	2.7		
California				
Population	33,873,086	37,253,956	3,380,870	10.0%
Households	11,502,871	12,577,498	1,074,627	9.3%
Average Household Size	2.9	2.9		

Notes:
(a) Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Sources: California, Department of Finance; US Census; BAE 2011.

The slower growth in the Bay Area is related to its relatively built out environment, compared to the state overall. While Central Valley locations, such as the Sacramento region, experienced large increases in the number of housing units, the Bay Area, which was relatively built out before the housing boom, only experienced moderate increases in housing units.

Regional Economic Trends

In the five-year period, between 2005 and 2010, the Bay Area's economic base shrank by 4.4 percent, decreasing from 3.23 million jobs to 3.09 million jobs. This represents slightly slower job loss than the State, where the number of jobs shrank by nearly six percent.

Manufacturing, Retail Trade, Professional, Scientific, and Technical Services, and Healthcare and Social Assistance, the largest private (non-government) sectors in the Bay Area's economy, each constituted 10 percent of the region's total jobs in 2010. Over the five-year period the Manufacturing sector lost 13 percent of its jobs, while the Retail Trade sector lost nine percent of its jobs. However, during this period, the Professional, Scientific, and Technical Services sector grew by 10 percent, while the Healthcare and Social Assistance sector grew by nearly 14 percent. Statewide, the Manufacturing and Retail Trade sectors declined by 17 and nine percent, respectively. However, the Professional, Scientific, and Technical Services and Healthcare and Social Assistance sectors grew by five and 13 percent, respectively. Overall, the Bay Area's economic base reflects the state's base, sharing a similar distribution of employment across sectors. Table 3 shows the jobs by sector in 2005 and 2010.

The affected industry, Cement Manufacturing, falls into the Manufacturing sectors, which represents 9.9 percent of the region's job base. The manufacturing sector's employment not only contracted between 2005 and 2010, but also decreased its share of the region's jobs one percent. The decrease in jobs follows the more recent national trends of the Great Recession, while decreases in the share of local jobs follows long-term national trends in manufacturing's reduced presence in the economy.

Table 3: Jobs by Sector, 2005-2010 (a)

Industry Sector	Bay Area 2005 (b) Jobs	Bay Area 2005 (b) % Total	Bay Area 2010 (c) Jobs	Bay Area 2010 (c) % Total	Bay Area % Change 2005-2010	California 2005 (b) Jobs	California 2005 (b) % Total	California 2010 (c) Jobs	California 2010 (c) % Total	California % Change 2005-2010
Agriculture	20,400	0.6%	19,000	0.6%	-6.9%	378,200	2.5%	381,600	2.7%	0.9%
Mining and Logging	800	0.0%	500	0.0%	-37.5%	23,600	0.2%	26,800	0.2%	13.6%
Construction	74,800	2.3%	50,100	1.6%	-33.0%	905,300	6.0%	559,800	3.9%	-38.2%
Manufacturing	350,400	10.8%	305,400	9.9%	-12.8%	1,502,600	9.9%	1,242,400	8.7%	-17.3%
Wholesale Trade	123,000	3.8%	113,200	3.7%	-8.0%	675,800	4.5%	643,200	4.5%	-4.8%
Retail Trade	336,700	10.4%	305,900	9.9%	-9.1%	1,659,300	10.9%	1,508,800	10.6%	-9.1%
Transportation, Warehousing, and Utilities	100,300	3.1%	90,200	2.9%	-10.1%	487,100	3.2%	464,900	3.3%	-4.6%
Information	112,900	3.5%	110,800	3.6%	-1.9%	473,600	3.1%	429,000	3.0%	-9.4%
Finance and Insurance	151,000	4.7%	118,200	3.8%	-21.7%	636,600	4.2%	511,900	3.6%	-19.6%
Real Estate and Rental and Leasing	55,600	1.7%	47,900	1.6%	-13.8%	283,600	1.9%	247,900	1.7%	-12.6%
Professional, Scientific, and Technical Services	289,100	8.9%	318,800	10.3%	10.3%	970,200	6.4%	1,020,600	7.1%	5.2%
Management of Companies and Enterprises	52,500	1.6%	54,200	1.8%	3.2%	222,100	1.5%	190,500	1.3%	-14.2%
Administrative and Waste Services	182,100	5.6%	167,100	5.4%	-8.2%	963,300	6.4%	858,300	6.0%	-11.4%
Educational Services	73,000	2.3%	81,700	2.6%	11.9%	272,200	1.8%	307,900	2.2%	13.1%
Health Care and Social Assistance	284,500	8.8%	324,100	10.5%	13.9%	1,321,200	8.7%	1,479,000	10.4%	11.9%
Arts, Entertainment, and Recreation	47,600	1.5%	37,200	1.2%	-21.8%	239,000	1.6%	241,200	1.7%	0.9%
Accommodation and Food Services	261,300	8.1%	209,600	6.8%	-19.8%	1,236,200	8.1%	1,252,500	8.8%	1.3%
Other Services, except Public Administration	108,800	3.4%	108,800	3.5%	0.0%	505,500	3.3%	484,700	3.4%	-4.1%
Government (d)	446,300	13.8%	430,200	13.9%	-3.6%	2,420,200	15.9%	2,427,100	17.0%	0.3%
Subtotal (e)	**3,071,100**	**95.1%**	**2,892,900**	**93.7%**	**-5.8%**	**15,179,500**	**100.0%**	**14,278,000**	**100.0%**	**-5.9%**
Additional Suppressed/Confidential Employment (f)	159,800	4.9%	195,900	6.3%	22.6%	n/a	n/a	n/a	n/a	
Total, All Employment	**3,230,900**	**100.0%**	**3,088,800**	**100.0%**	**-4.4%**	**15,179,500**	**100.0%**	**14,278,000**	**100.0%**	**-5.9%**

Notes:
(a) Includes all wage and salary employment covered by unemployment insurance.
(b) Represents employment for calendar year, 2005.
(c) Represents employment for calendar year, 2010.
(d) Government employment includes workers in all local, state and Federal sectors, not just public administration. For example, all public school staff are in the Government category.
(e) Totals may not add due to independent rounding.
(f) County employment for some industries were suppressed by EDD due to the small number of firms reporting in the industry for a given county.

Sources: California Employment Development Department, BAE, 2011.

Affected Industry

The proposed rule would affect Portland cement manufacturers, which are included in the Cement Manufacturing sector (NAICS Code 327310). According to the US Census, in 2009, the Bay Area had three cement manufacturing establishments that accounted for 234 jobs. Dividing the total jobs by the number of establishment shows that on average, each establishment employed 78 workers. However, BAAQMD staff indicated that there is only one Portland cement plant in the Bay Area, Lehigh. Since the NAICS sector has a broader definition of firms than the proposed rule, Census data includes additional cement manufacturing establishments that would not be subject to Rule 9-13. Lehigh is represented as the firm with over 100 employees. Table 4 shows the profile of the affected industry.

Table 4: Profile of Affected Industry, 2009

Industry	Cement Manufacturing (a)
Employment (b)	234
Average Employment per Establishment	78
Number of Establishments (by workforce size)	
1-4	1
5-9	0
10-19	0
20-49	1
50-99	0
100+	1
Total	3 (c)

Notes:
(a) The Portland Cement Manufacturing industry is defined as NAICS 327310, Cement Manufacturing.
(b) In cases where the actual employment number is not disclosed for confidentiality purposes, the analysis uses the midpoint employment number for each size cohort.
(c) BAAQMD estimates that the Bay Area has one establishment in this sector will be affected by the proposed Rule.

Sources: U.S. Census County Business Patterns, 2009; BAE, 2011.

SOCIO-ECONOMIC IMPACTS

This section discusses the analysis' methodology, as well as the economic profile of the affected industry, and annualized rule compliance costs associated with adopting Rule 9-13. It then determines whether the annualized compliance costs would significantly burden the affected industry, and estimates adoption of the rule's regional economic impacts.

Methodology

In order to estimate the economic impacts of adopting Rule 9-13 on the Portland cement manufacturing industry, this report compares the affected industry's annualized compliance costs with its profit ratios. The analysis uses data from the BAAQMD, 2009 US Census County Business Patterns, the 2000-2010 Annual Survey of Manufacturers, 2000-2010 IRS corporate income returns data, and the 2007 US Economic Census.

The BAAQMD identifies the affected industry as Portland Cement Manufacturing (a subset of NAICS 327310). According to BAAQMD records, there is one Portland cement plant establishment (Lehigh) in the Bay Area that would be subject to the proposed rule. BAAQMD staff indicates that the Bay Area Lehigh plant employs 150 workers.

Economic Profile of Affected Industries

As shown in Table 5, according to 2000-2010 US Annual Survey of Manufacturers data, the average California firm in the Cement Manufacturing sector has average annual sales per employee of approximately $697,787.[7] Multiplying the average statewide revenues per employee by the number of Lehigh employees (150 workers) shows that on average, Leigh's establishment has total annual revenues of $102 million. Table 5 shows the affected industry's annual employment and sales data.

[7] Reported in 2011 dollars using Producer Price Index for cement.

Table 5: Cement Manufacturing Industry, Sales

Number of Employees	Number of Establishments (a)	Average # of Employees (b)	Average Annual Sales (c)	Total Sales	Total Employees
1-4	0	0	$0	$0	0
5-9	0	0	$0	$0	0
10-19	0	0	$0	$0	0
20-49	0	0	$0	$0	0
50-99	0	0	$0	$0	0
100+	1	150	$101,968,090	$101,968,090	150
Total	**1**	**150**	**$101,968,090**	**$101,968,090**	**150**

Notes:
(a) The number and sizes of businesses affected for each industry comes from BAAQMD data.
(b) Per BAAQMD staff.
(c) Based on 2000-2010 Annual Survey of Manufacturers data for cement manufacturing businesses in the United States. 327310, Cement Manufacturing. Reported in 2011 dollars.
Average revenues per employee $679,787

Sources: Annual Survey of Manufacturers, 2000-2012; BAAQMD, 2012; BLS Producer Price Index, 2012; BAE, 2012.

The IRS provides data on total sales and net income for the Cement, Concrete, Lime, and Gypsum Product Manufacturing sector. According to IRS data, between 2000 and 2010 Portland cement manufacturing firms averaged a 6.5 percent rate of return on total sales. As Table 6 shows, during an average year the Lehigh plant would generate net profits of approximately $6.6 million.

Table 6: Cement Manufacturing Industry Profits

Number of Employees	Number of Establishments	Average Annual Sales (a)	Average Return on Sales (b)	Average Profits	Total Profits
1-4	0	$0	6.5%	$0	$0
5-9	0	$0	6.5%	$0	$0
10-19	0	$0	6.5%	$0	$0
20-49	0	$0	6.5%	$0	$0
50-99	0	$0	6.5%	$0	$0
100+	1	$101,968,090	6.5%	$6,594,800	$6,594,800
Total	**1**	**$101,968,090**	6.5%	**$6,594,800**	**$6,594,800**

Notes:
(a) Based on 2007 Economic Census data for petroleum refinery businesses in California. 324110, Petroleum Refineries.
(b) Based on 2000-2010 IRS data for Corporation Income Tax Returns: Returns of Active Corporations, Table 1.

Sources: Annual Survey of Manufacturers, 2000-2012; BLS Producer Price Index, 2012; IRS, 2000-20120; BAE, 2012.

Description of Compliance Costs

In order to meet the proposed rule's emissions reductions requirements, Lehigh will have to employ several control measures and equipment. Two of the equipment upgrades refer specifically to meeting NESHAP's TAC requirements, while the other two are necessary to meet BAAQMD's additional NOx and PM requirements. Because the Portland cement industry is cyclical, the analysis uses 10-year average sales and profits to determine the proposed Rule's economic impacts. As Table 7 shows, the annualized costs of complying with NESHAP and BAAQMD requirements would be

approximately $4 million. The annualized costs of compliance with the BAAQMD requirements only would be approximately $1.16 million.

Table 7: Compliance Costs

	Total Costs	Annualized Costs
NESHAP Requirements		
Capital Costs (a)	$0	$0
Annual Operating Costs (b)		
Activated Carbon Injection (c)	$1,220,318	$1,220,318
Lime Slurry Injection (c)	$1,255,184	$1,255,184
CEMS O&M (c)	$362,609	$362,609
SUBTOTAL: NESHAP Requirements	*$2,838,111*	*$2,838,111*
District Requirements		
SNCR	$2,300,000	$115,000 (d)
Stack Requirement Modifications	$2,500,000	$125,000 (d)
Annual Operating Costs (c), (e)	$922,082	$922,082
SUBTOTAL: NOx Control	*$5,722,082*	*$1,162,082*
Total Costs	**$8,560,194**	**$4,000,194**

Notes:
(a) NESHAP requirement capital costs range from $27 million - $32 million but since Lehigh has already spent this money to be in compliance with NESHAP, no additional capital costs are anticipated.
(b) If Congress or the Courts negate NESHAP requirements, Lehigh would still be responsible for these costs under Rule 9-13.
(c) Based on Lehigh's estimates of annual costs for full operations scaled down to reflect that in the average year (between 2001 and 2010), Lehigh produced 70% of its total permitted clinker.
(d) Capitalized over 20 years using a straight line depreciation method.
(e) Estimated costs based on ten year average of 70% clinker production.

Sources: BAAQMD, 2011-2012; BAE, 2012.

NESHAP Compliance Costs (Federal)

Capital Costs

Lehigh has already purchased and applied for operating permits for the equipment necessary to comply with NESHAP's new TAC standards. A hydrated Lime injection system (LIS) and activated carbon injection (ACI) will bring Lehigh into NESHAP compliance and reduce SO2 emissions. Including the continuous emissions monitoring system (CEMS) and parametric monitors, control equipment designed to bring Lehigh into NESHAP compliance would cost between $27 million and $32 million. Since Lehigh has already purchased and installed this equipment, there are no additional capital costs to comply with Rule 9-13.

Annual Operating and Maintenance Costs

As Table 7 shows, operating and maintaining the capital equipment will cost Lehigh approximately $2.8 million, annually. Lehigh projects that at capacity operating levels, activated carbon injection, lime slurry injection, and CEMS operations and maintenance would cost $4.1 million. Between

2000-2010, on average, Lehigh produced 70 percent of its permitted clinker limit, per year. Using average annual production levels, annual operations and maintenance would cost Lehigh 70 percent of maximum costs, or $2.8 million.

Currently, these costs are not specific to BAAQMD requirements. Since NESHAP applies to all Portland cement plants in the United States, the ongoing compliance costs would not change Lehigh's relative competitiveness. Normally, the analysis would not include costs that apply to all plants and would not change a firm's competitiveness. However, in the event that Congress or the courts overturn the new NESHAP requirements, Lehigh would still be required to meet its requirements under the proposed BAAQMD rule. Since plants outside of the District would not be subject to overturned NESHAP requirements, the ongoing costs could impact Lehigh's relative competitiveness. In order to fully examine the proposed rule's potential impacts, the analysis considers the economic impacts of ongoing NESHAP compliance costs.

NOx Control and Stack Height Compliance Costs (District)

Capital Costs

In order to comply with the portions of Rule 9-13 that extend beyond NESHAP requirements, Lehigh would need to modify its stack so that emissions would not result in the need to notify residents under the District's Air Toxics Health Risk Information and Assessment Act program (AB2588) at full production capacity. In addition, Lehigh would need to purchase and install post-combustion selective non-catalytic reduction (SNCR) cement kiln exhaust NOx reduction equipment to comply with the NOx emission limits. Lehigh has not yet implemented either of these control measures.

The District's AB2588 program requires notification to nearby residents if the results of a health risk assessment indicate that airborne emissions increase the cancer risk by more than 10 in one million, or cause an acute hazard index of greater than 1. Lehigh had conducted a health risk assessment in 2011 and determined that a 300 foot stack would disperse pollutants sufficiently so that notification was not required. However, other stack configurations that reduce exposure to an equivalent level may be considered.

As Table 7 shows, equipment modifications and new equipment necessary to comply with the proposed rule would cost Lehigh approximately $4.8 million. Stack requirement modifications (assuming the 300 foot stack scenario) would cost approximately $2.3 million, and SNCR equipment would cost approximately $2.5 million. However, the construction of a single stack also saves the expense of multiple monitors. Both the NESHAP the District's NOx standards require the use of emission monitors to determine compliance with the limits. Monitors for the components of the NESHAP, specifically for mercury and particulate matter, are relatively new and expensive. The cost of installing and using four monitors to comply with the NESHAP standards (organics and hydrochloric acid in addition to the mercury and particulate) is estimated to be $1,475,000. Lehigh currently has a baghouse with 32 separate openings. Consolidating these into a single stack allows them to utilize one emissions monitor for each pollutant, instead of multiple monitors. Using a 20-

year[8] straight-line calculation to annualize capital costs over the life of the equipment shows that on an annual basis, a 300 foot stack would cost Lehigh approximately $240,000.

Annual Operating and Maintenance Costs
According to the BAAQMD workshop report, the rule would also result in annual SNCR operating costs. At 2011 production rates, the cost of operating the SNCR equipment would be $700,000 per year, or $0.83 per ton of clinker. In an average year Lehigh produces 70 percent of its permitted clinker. As Table 7 shows, on average, operating the SNCR equipment would cost Lehigh an additional $922,082 per year.

Affected Industry's Economic Impacts Analysis

In order to determine the impacts Lehigh, this analysis compares its annualized compliance costs to annual profits. The analysis estimates compliance costs using a 20-year straight-line capital improvement depreciation methodology. Average revenue estimates come from the 2000 – 2010 U.S. Annual Surveys of Manufacturers' reported cement manufacturers' revenues, in conjunction with the IRS' average cement, concrete, lime, and gypsum product manufacturers' 10-year average profit ratio.

The analysis then calculates the compliance costs as a percentage of profits to determine the level of impact. The BAAQMD uses the ARB's 10 percent threshold as a proxy for burden. Annualized compliance costs resulting in profit losses of 10 percent or more indicate that the proposed Rule has the potential for significant adverse economic impacts. The analysis considers the impacts from NOx costs alone, as well as the joint NOx and NESHAP costs. Table 8 shows the annualized compliance costs as a share of total profits for the cement manufacturing industry.

[8] The analysis assumes that stack modifications and SNCR equipment would have a 20-year lifecycle.

Table 8: Rule 9-13 Compliance Cost as Share of Profit

Cost of NOx controls, without ongoing NESHAP costs

Number of Employees	Number of Establishments	Average Annual Sales	Average Return on Sales	Average Profits	Total Profits	Compliance Cost	Share of Annual Profit
1-4	0	$0	6.5%	$0	$0	$0	0%
5-9	0	$0	6.5%	$0	$0	$0	0%
10-19	0	$0	6.5%	$0	$0	$0	0%
20-49	0	$0	6.5%	$0	$0	$0	0%
50-99	0	$0	6.5%	$0	$0	$0	0%
100+	1	$101,968,090	6.5%	$6,594,800	$6,594,800	$1,162,082	18%
Total	1	**$101,968,090**	**6.5%**	**$6,594,800**	**$6,594,800**	**$1,162,082**	**18%**

Cost including NESHAP O&M Costs

Number of Employees	Number of Establishments	Average Annual Sales	Average Return on Sales	Average Profits	Total Profits	Compliance Cost	Share of Annual Profit
1-4	0	$0	6.5%	$0	$0	$0	0%
5-9	0	$0	6.5%	$0	$0	$0	0%
10-19	0	$0	6.5%	$0	$0	$0	0%
20-49	0	$0	6.5%	$0	$0	$0	0%
50-99	0	$0	6.5%	$0	$0	$0	0%
100+	1	$101,968,090	6.5%	$6,594,800	$6,594,800	$4,000,194	61%
Total	**1**	**$101,968,090**	**6.5%**	**$6,594,800**	**$6,594,800**	**$4,000,194**	**61%**

Sources: Annual Survey of Manufacturers, 2000-2012; BLS Producer Price Index, 2012; IRS, 2000-20120; BAAQMD, 2011-2012; BAE, 2012.

As Table 8 shows, annualized compliance costs of just the BAAQMD requirements represent 18 percent of Lehigh's profits, while the District and NESHAP compliance costs together represent approximately 61 percent of Lehigh's profits. Thus, compliance costs are above the 10 percent threshold for both scenarios, suggesting that Rule 9-13 could provide a significant burden to Lehigh. However, since Lehigh was able to absorb the $27 million to $32 million construction costs of NESHAP compliance, complying with Rule 9-13 may not result in Lehigh's closure. In addition, to the extent that Lehigh can pass some or all of the additional costs onto consumers, the proposed rule may not adversely affect its operations.

Ability to Pass Through Costs

An industry may be able to absorb compliance costs or they may be able to pass them through to customers. Costs are more likely to be able to be passed on when a product is demand-inelastic. In this case, the ability to pass costs of the rule through to customers is not known. The United States imports about 20% of cement to meet construction needs, so the impact on one facility, or the nation's facilities in the case of the NESHAP, may not be able to be passed through to customers without increasing imports. Table 8 shows that the NOx controls would cost $1,162,082 or 18% of Lehigh's annual profit. At a production rate of 847,000 tons of clinker (2011), if the entire compliance costs could be passed on, the cost of cement would have to increase by $1.30/ton (1.3% based on a March, 2012 cement price of about $100 per ton (Mineral Commodity Survey, USGS Survey, January, 2012)). (Clinker is about 95% of the cost of cement.) To reduce the costs to less than 10% of profits (the threshold for significance), the cost of cement would have to increase by $0.72/ton (0.72%).

The costs of compliance with the NESHAP standards are higher. Table 8 shows NESHAP compliance costs of $2,838,111. Should these EPA standards continue to be applicable in the face of ongoing litigation and potential legislative action, all Portland cement manufacturers nationwide would be subject to the same standards and incur some of the same costs, depending in part on what the constituents of the raw materials were at each facility. The NESHAP costs are 43% of Lehigh's annual profit. At the 2011 production rate of 847,000 tons of clinker the price of cement would need to increase by $3.18 per ton (3.18%). Combined with the costs to meet the NOx standards, Lehigh would have to increase the cost of cement by $4.48 per ton (4.48%) to completely offset the costs, and by $3.53 to reduce costs to the 10% threshold.

In August, 2010, EPA issued "Regulatory Impact Analysis: Amendments to the National Emissions Standards for Hazardous Air Pollutants and New Source Performance Standards (NSPS) for the Portland Cement Manufacturing Industry, Final Report." In the report, EPA estimated that the NESHAP standards could raise the price of cement by $4.50 or 5% (2005 prices). They further estimated that cement imports could rise by 10% to offset reductions in domestic production and price increases. EPA estimates nationwide costs (direct engineering costs and indirect social costs) of $904 to $930 million nationwide and benefits of $7.4 to $18 billion, for net benefits of $6.5 to $17 billion annually.

Affected Industry and Regional Employment Impacts

Although Lehigh may be able to absorb the Rule's compliance costs, annual compliance costs represent more than ten percent of annual revenues, suggesting that the proposed Rule has the potential to affect regional employment.[9] As Table 9 shows, the proposed rule would result in the direct loss of 150 jobs should the Lehigh facility close rather than comply with the proposed rule.

Table 9: Potential Employment Loss

Number of Employees	Number of Establishments	Number of Establishments Imapcted	Average Employment Per Establishment	Total Employment Loss
1-4	0	0	0	0
5-9	0	0	0	0
10-19	0	0	0	0
20-49	0	0	0	0
50-99	0	0	0	0
100+	1	1	150	150
Total	**1**	**1**		**150**

Sources: US Census County Business Patterns, 2009; US Economic Census, 2007; BAAQMD, 2011; BAE, 2012.

Regional Indirect and Induced Impacts

Indirect and induced impacts refer to regional multiplier effects of increasing or decreasing regional economic activity. If the proposed Rule amendments significantly impacted local businesses, any closures would result in direct regional economic losses. Firms would no longer buy goods from local suppliers, thereby resulting in reduced indirect impacts, or business-to-business expenditures. In addition, businesses would no longer employ regional residents, resulting in reduced induced impacts in the form of household spending. Because the proposed amendments could result in significant direct impacts to dry cleaning industry employment, the analysis uses the IMPLAN input-output model to estimate the indirect or induced impacts.

IMPLAN Input-Output Model

Economists use regional and national input-output models as a tool to understand the complex interactions among the various parts of an economy. The economic model used in this analysis, IMPLAN ("IMpact analysis for PLANning"), is a PC-based computer software package that automates the process of developing input-output models for regions within the United States. The IMPLAN model is well respected as the industry standard for projecting economic impacts resulting from current or future economic activities, often called "events." In this study, the loss of Lehigh sales and employment makes up the economic "event" modeled.

[9] The region includes the following nine Bay Area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma.

At the heart of the IMPLAN model is a county-level trade flow called the Social Accounting Matrix (SAM) constructed from the production functions of 440 industries, using data from a variety of sources including the Bureau of Economic Analysis, Bureau of Labor Statistics, and US Census. The SAM uses each county's observed economic relationships between government, industry, and household sectors, allowing IMPLAN to model payments between industries, between households and industries, between government and industries, and between government and households. Thus, for a specified region, the input-output table accounts for all of the dollar flows between the different sectors within the economy. IMPLAN then applies county-level price and wage data, as well as the availability of goods within the nine-county Bay Area to estimate the specific impacts.

Once the economic event has been entered into the model, IMPLAN reports the following types of impacts:

- Direct Impacts. Direct impacts refer to the set of producer or consumer expenditures applied to the predictive model for impact analysis.[10] It is the amount of spending that is no longer available to flow through the local economy. IMPLAN then displays how the local economy will then respond to these initial changes.

- Indirect Impacts. The indirect impacts refer to the impact of local industries buying goods and services from other local industries. The cycle of spending works its way backward through the supply chain until all money leaks from the local economy, either through imports or by payments to income and taxes.[11] For Lehigh, this would include payments for cement clinker inputs such as limestone, calcium, fuel, office supplies, and any other non-labor payments that a Portland cement manufacturing firm would purchase.

- Induced Impacts. The induced impacts refer to an economy's response to an initial change (direct impact) that occurs through re-spending of income according to household spending patterns.[12] When households earn income, they spend part of that income on goods and services, such as food and healthcare. IMPLAN models households' disposable income spending patterns and distributes them through the local economy.

Economic Impacts of Reduced Portland Cement Manufacturing Employment

The reduced employment and operating expenditures flow through the nine-county Bay Area economy to generate ongoing annual economic losses. As Table 10 shows, the potential job losses could result in $196.3 million in annual regional economic losses and approximately 619 permanent job losses.

[10] IMPLAN Online Glossary, 2012.
[11] Ibid.
[12] Ibid.

Table 10: Potential Regional Losses from Rule 9-13

Impact	Employment	Labor Income	Output
Direct	(150)	($29,716,800)	($107,899,600)
Indirect	(195)	($15,440,100)	($45,391,900)
Induced	(274)	($15,584,600)	($43,004,800)
Total	**(619)**	**($60,741,500)**	**($196,296,300)**

Sources: IMPLAN, 2010; BAE, 2012.

Of the total losses, 150 jobs and $107.9 million would come directly from Lehigh's closure. IMPLAN data show that Lehigh employees would lose $29.7 million in labor income.[13] Supporting industries would lose 195 jobs, $15.4 million in labor income, and $45.4 million in sales. The Bay Area economy would lose an additional 274 jobs, $15.6 million in labor income, and $43 million from reduced household spending. Total losses would represent less than one-tenth of one percent of total 2010 Bay Area employment.

On April 16, 2012, a settlement agreement was filed in the US Circuit Court of Appeals regarding the lawsuit brought by cement manufacturing companies and the Portland Cement Association against EPA. As per that settlement, on June 22, 2012, EPA proposed revisions to the NESHAP including a two year delay in the compliance deadline, and slight changes to the emissions standards for PM and Organic HAPs. EPA has requested comments on their findings via the Federal Register, and will finalize the amendments in December of 2012. If the two year delay is finalized, the costs of NESHAP compliance under the proposed District rule will be in effect for two years, after which these standards will be consistent with cement manufacturing in the rest of the country.

[13] Labor income include payments to employees, proprietor's income, and corporate income.

IMPACT ON SMALL BUSINESSES

According to California Government Code 14835, a small business is any business that meets the following requirements:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California;
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
    - A business with 100 or fewer employees, and an average annual gross receipts of $10 million or less over the previous three tax years, or
    - A manufacturer with 100 or fewer employees.

Using these definitions, Lehigh does not qualify as a small business. Since the proposed rule would not affect any other businesses, it would not place a disproportionate burden on small businesses.

APPENDIX D

CALIFORNIA ENVIRONMENTAL QUALITY ACT INITIAL STUDY AND NEGATIVE DECLARATION

Initial Study/Negative Declaration for the Amendments to Bay Area Air Quality Management District Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants From Portland Cement Manufacturing

Prepared for:

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Contact: Robert Cave
(415) 749-5058

Prepared By:

Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92870
Contact: Debra Bright Stevens
(714) 632-8521

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FIGURES:

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Chapter 1

Introduction

Purpose of this Document

This Negative Declaration assesses the environmental impacts of the proposed adoption of Regulation 9, Rule 13 – Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing (Regulation 9-13) - by the Bay Area Air Quality Management District (BAAQMD or District). This assessment is required by the California Environmental Quality Act (CEQA) and in compliance with the state CEQA Guidelines (Title 14 California Code of Regulations §15000 et seq.). A Negative Declaration serves as an informational document to be used in the decision-making process for a public agency that intends to carry out a project; it does not recommend approval or denial of the project analyzed in the document. The BAAQMD is the lead agency under CEQA and must consider the impacts of the proposed rule amendments when determining whether to adopt them. The BAAQMD has prepared this Negative Declaration because no significant adverse impacts are expected to result from the proposed rule amendments.

Scope of this Document

This document evaluates the potential impacts of the Proposed project on the following resource areas:

- aesthetics,
- agriculture and forestry resources,
- air quality,
- biological resources,
- cultural resources,
- geology / soils,
- greenhouse gas emissions,
- hazards & hazardous materials,
- hydrology / water quality,
- land use / planning,
- mineral resources,

- noise,
- population / housing,
- public services,
- recreation,
- transportation / traffic, and
- utilities / service systems.

Impact Terminology

The following terminology is used in this Initial Study/Negative Declaration to describe the levels of significance of impacts that would result from the proposed rule amendments:

- An impact is considered *beneficial* when the analysis concludes that the project would have a positive effect on a particular resource.
- A conclusion of *no impact* is appropriate when the analysis concludes that there would be no impact on a particular resource from the proposed project.
- An impact is considered *less than significant* if the analysis concludes that an impact on a particular resource topic would not be significant (i.e., would not exceed certain criteria or guidelines established by BAAQMD). Impacts are frequently considered less than significant when the changes are minor relative to the size of the available resource base or would not change an existing resource.
- An impact is considered *less than significant with mitigation incorporated* if the analysis concludes that an impact on a particular resource topic would be significant (i.e., would exceed certain criteria or guidelines established by BAAQMD), but would be reduced to a less than significant level through the implementation of mitigation measures.

Organization of This Document

The content and format of this document, described below, are designed to meet the requirements of CEQA.

- Chapter 1, "Introduction," identifies the purpose, scope, and terminology of the document.
- Chapter 2, "Description of the Proposed Rule," provides background information of Regulation 9, Rule 10, describes the proposed rule amendments, and describes the area and facilities that would be affected by the amendments.

- Chapter 3, "Environmental Checklist," presents the checklist responses for each resource topic. This chapter includes a brief setting description for each resource area and identifies the impact of the proposed rule amendments on the resources topics listed in the checklist.

- Chapter 4, "References Cited," identifies all printed references and personal communications cited in this report.

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Chapter 2

Description of the Proposed Rule

BACKGROUND

The BAAQMD is proposing to regulate nitrogen oxides (NO_X), particulate matter (PM), toxic air contaminants (TACs), and ammonia emissions from Portland cement manufacturing operations by adopting Regulation 9, Rule 13, (Regulation 9-13). Regulation 9-13 is proposing to impose NOx, PM, and TAC limits based on the tons of clinker (a preliminary stage of cement) produced at Portland cement manufacturing facilities operating within the District's jurisdiction. Currently, there is one existing Portland cement manufacturing facility within the jurisdiction of BAAQMD known as the Lehigh Southwest Cement Plant (Lehigh).

In Stationary Source Control Measure 9 (SSM-9) of the Bay Area 2010 Clean Air Plan, the District identified Portland cement manufacturing as a potential source of emissions reductions of NOx, a precursor of ozone and secondary fine particulate matter. Additionally, the control measure sought to reduce emissions of sulfur dioxide (SO_2), a precursor of fine particulate matter, and PM, from the manufacturing of Portland cement. Reducing emissions would allow the District to make progress toward meeting federal and state ozone and particulate standards, for which the District is currently in a non-attainment status.

In August of 2010, the United States Environmental Protection Agency (U.S. EPA) issued final amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for the Portland Cement Manufacturing Industry. The revised NESHAP significantly reduces emissions of TACs from new and existing Portland cement kilns. Since adoption of the amended rule, individual Portland cement manufacturing companies along with the national industry association have petitioned the U.S. EPA to reconsider these rules, and subsequently challenged them in Federal Court. In addition, legislation has been proposed in both the U.S. House of Representatives and Senate (H.R. 2681 and S. 1610, Cement Sector Regulatory Relief Act of 2011) to provide a legislative stay of U.S. EPA emissions standards that apply to cement manufacturing plants. In April, 2012, a settlement agreement was reached between the cement manufacturers and EPA. It stipulates EPA will consider comments submitted by the industry and, by June 15, 2012, propose a delay of up to two years, or leave the deadline unchanged and solicit comments on the action. In order to ensure that emissions from the manufacture of Portland cement are expeditiously reduced in the Bay Area, the NESHAP emissions limits for the Portland Cement Industry are included in the proposed Regulation 9-13.

On June 22, 2012, EPA proposed revised amendments to the NESHAP. The NESHAP would, if finalized in December, 2012, allow two additional years to comply with the

limits and change the limit for PM from 0.04 pounds per ton of clinker to 0.07 pounds per ton of clinker. To provide the most stringent standard feasible to protect public health, the District proposes to make the standards for TACs go into effect in 2013 and to retain the 2010 NESHAP limit of 0.04 pounds PM per ton of clinker.

OBJECTIVES

In SSM-9, the District suggested further limits of NOx, PM, and SO_2 emissions from cement production. The objective of the proposed Regulation 9-13 is to achieve the maximum feasible, cost effective emissions reductions of NOx and PM in concert with efforts to bring the Lehigh facility into compliance with limits for TACs consistent with the federal NESHAP requirements. NOx reductions are necessary in order to reduce ozone levels in the Bay Area and reduce transport of air pollutants to neighboring air basins. The Bay Area and neighboring regions are not yet in attainment with the State one-hour ozone or PM standards, so further emission reductions are needed.

The U.S. EPA has set primary national ambient air quality standards for air pollutants to define the levels considered safe for human health. The California Air Resources Board (CARB) has also set California ambient air quality standards. The Bay Area is a non-attainment area for the state one-hour ozone standard and federal eight-hour ozone standard. In addition, the Bay Area is not in attainment of California ambient air standards for particulate matter of 10 microns or less (PM10) or for particulate matter of 2.5 microns or less (PM2.5). Under State law, non-attainment areas must prepare plans showing how they will attain the state standards. The BAAQMD has prepared, approved and is currently implementing, the 2010 Clean Air Plan (CAP) which provides a plan to show how the district will meet applicable air quality standards. The CAP included SSM-9, which considers emissions reductions of NOx and PM from the manufacturing of Portland cement.

PROPOSED RULE

The District is considering adoption of Regulation 9-13 to achieve the maximum feasible, cost effective emissions reductions of NOx and PM in concert with efforts to bring the Lehigh facility into compliance with limits for TACs consistent with the 2010 federal NESHAP requirements.

Two federal rules address air emissions from the manufacture of Portland cement: New Source Performance Standards (NSPS) and NESHAPs. EPA promulgates NSPS for specific industrial operations to address emissions of criteria pollutants from new, modified, and reconstructed sources. NESHAP requirements address TAC emissions from both new and existing sources, and may have separate standards for each case. The most recent amendments to the NSPS for Portland cement manufacture were proposed in June 2008. The previous standard remains in effect for all sources constructed after 1971. For facilities constructed, modified, or reconstructed after June 6, 2008, emissions standards are more stringent and continuous emission monitoring systems (CEMS) are

required. The EPA issued final amendments to the NESHAP and NSPS requirements for cement kilns concurrently in August of 2010. The modifications to the NSPS and NESHAP were required to be implemented by September 2013, but the compliance deadline has been extended until September, 2015 in the revised amendments to the federal rules. The implementation of the amendments to the NESHAP requirements for cement kilns are expected to result in emission reductions of mercury, total hydrocarbons and hydrogen chloride. The implementation of the NSPS requirements for cement kilns are expected to result in emission reductions of SO_2, NOx and PM.

As an existing facility, Lehigh is not subject to the criteria pollutant emissions standards of the amended NSPS. Significant modifications will be required to reduce TAC emissions, including additional controls such as lime slurry injection (LSI) and activated carbon injection (ACI), as well as enhanced monitoring requirements. The emission limits proposed in Regulation 9-13 represent the maximum feasible NOx and PM controls as applied to an existing unmodified source. The equipment modifications necessary to meet the proposed NOx emission limit may result in some excess ammonia emissions. Ammonia is a TAC and a precursor to secondary particulate matter formation, for this reason an ammonia emission limit is included in the proposed rule. Additional requirements of the proposed rule address concerns over the present configuration of the emission point from the kiln, and the need for enforceable fugitive dust control and mitigation measures. The proposed effective date of September 9, 2013 corresponds with that of the NESHAP as amended prior to the June, 2012 proposal.

Criteria Pollutant Emissions Limits

The District proposes the following emission limits for Portland cement manufacturing kilns:

- 2.3 pounds NOx per ton of clinker produced averaged over 30 days
- 0.04 pounds PM per ton of clinker produced
- 10 ppmv ammonia above baseline, dry at 7 percent oxygen averaged over 24 hours.

Where possible, limits and averaging times are expressed to maintain consistency with federal standards and represent the most stringent limits that Lehigh can achieve for these pollutants in a cost-effective manner. BAAQMD has evaluated the controls required by the federal standards and has proposed these standards based on reasonably achievable emission rates for this facility. The NOx and ammonia emission limits will require the use of a continuous emission monitoring system (CEMS) or parametric monitors, as well as a means of monitoring and recording the production rates. PM emission limits will be determined by source test. CEMS, parametric monitors, and production monitoring requirements are detailed in the monitoring and records section of the rule. There is currently no commercially available CEMS for PM; however, there is a reasonable expectation that parametric monitoring equipment will become available before the federal standards requiring CEMS for PM go into effect in 2015. Because of this

uncertainty, the federal rule will require CEMS but compliance will be determined by source test. Lehigh has already installed a parametric monitor to measure ammonia and is currently calibrating and testing this equipment for quality assurance of the measurements. All CEMS and parametric monitors are required to comply with the provisions of the District Manual of Procedures, federal requirements, and to maintain records as provided in District Regulation 1. An initial demonstration of compliance with these emission limits must be performed within 90 operating days of the effective date of the rule and repeated annually thereafter.

Toxic Air Contaminant (TAC) Emissions Limits

The following emission limits are proposed to address TACs:

- 0.2 nanograms dioxins/furans (TEQ) per standard cubic meter, dry at 7 percent oxygen averaged over 24 hours
- 55 pounds mercury per million tons of clinker produced averaged over 30 days
- 24 ppmv Total Hydrocarbons (THC), dry at 7% oxygen averaged over 30 days, or alternatively, 9 ppmv total organic hazardous air pollutant (HAP), dry at 7 percent oxygen averaged over 30 days
- 3 ppmv hydrogen chloride, dry at 7 percent oxygen averaged over 30 days.

The proposed emissions limits are consistent with the federal NESHAP requirements and will provide protection to nearby communities should the federal rules be delayed or overturned either through legislative efforts or pending litigation. Lehigh has currently installed control equipment (LSI and ACI) and monitoring equipment (CEMS and parametric monitors) in order to meet the compliance date of the federal rules.

Opacity Standard and Dust Control

BAAQMD proposes an opacity limit of 10 percent opacity lasting for no more than three minutes in any one hour period from any miscellaneous operation or emissions point other than the kiln or clinker cooler, which are subject to more stringent monitoring by CEMS. Compliance with this standard will be facilitated through the following dust mitigation control measures:

- Mitigation measures to minimize fugitive dust emissions from disturbed soil, open areas and unpaved roads
- Surface stabilization methods for material storage piles and dust suppression methods for material transfer processes, material handling equipment, housekeeping, and material cleanup
- Track-out prevention and control provisions to minimize dust emissions from paved roads

- Vehicle traffic speed limits
- Provisions to minimize emissions from material transfer and blasting at rock quarries
- Personnel training procedures.

These fugitive dust mitigation measures were derived from the Fugitive Dust Control Plan (FDCP) that Lehigh developed in cooperation with the District, as part of Lehigh's recent Title V permit renewal. To provide clarity and improve enforceability, additional definitions and test methods were derived from the California Air Resources Board Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations.

Emission Point Requirements

District staff is proposing that emissions from the kiln enter the atmosphere from a point such that the facility would not be required to perform notifications as per the Air Toxics Hot Spots Program. A Health Risk Assessment performed in accordance with OEHHA guidelines on the revised emissions stack must be submitted to the District showing that even assuming maximum permitted operations, the health risk to surrounding community remains below significance thresholds. In general, a higher emission point allows emitted pollutants to be transported over a longer distance before reaching ground level. The concentration of pollutants decreases as the plume travels from the point of release and is dispersed by wind and other natural forces, greatly reducing health impacts. Structural constraints, dynamic back pressure on the plume, as well as aesthetics and compliance with local building codes place constraints on the actual height of the stack.

Sulfur Dioxide

On June 2, 2010, EPA established a new one-hour SO_2 ambient air quality standard which became effective on August 23, 2010. The new national standard, 0.075 ppmv, is considerably more stringent than the existing California ambient air quality standard, 0.25 ppmv. District staff is examining whether existing sources of SO_2, including Lehigh, have emissions sufficient to result in SO_2 concentrations above the new ambient standard. Based on preliminary dispersion modeling according to EPA specified methodology, Lehigh's SO_2 emissions may result in modeled concentrations above the standard; however, consistent with every other major source of SO_2 in the District, these modeling results do not correlate well with local monitoring data. This is likely due to the complex terrain surrounding the Lehigh facility, which is not adequately accommodated by the AERMOD model. In such instances, the model greatly over-predicts the likely downwind concentration (between 5 and 10 times the monitored data for complex terrain versus twice the monitored data for flat terrain). District staff is evaluating the potential of other models to more closely correlate with existing monitoring and improve the accuracy of the modeled results. Currently Lehigh is limited by permit condition to SO_2 emissions of 481 pounds per hour.

As mentioned previously, the LSI and ACI systems recently installed at Lehigh will reduce SO_2 emissions and the elevated stack will greatly reduce ground level concentrations of this pollutant. No SO_2 emissions standard is being proposed in this rule at this time; however, should future modeling or monitoring results indicate the need for SO_2 reductions from the facility, an emissions standard will be proposed that ensures that Lehigh does not cause an exceedance of the new standard.

PROPOSED METHOD OF CONTROL

Controlling Emissions from Cement Manufacturing

The manufacturing of cement requires the movement and processing of many tons of material as well as the combustion of large amounts of fuel in order to heat that material to extremely high temperatures. Emissions of pollutants are directly attributable to both the fuel combustion and materials processing. Any improvements to the efficiency of the material handling processes as well as the delivery of heat can result in a reduction in emissions to the atmosphere. Over many years of operation Lehigh has implemented efficiency related modifications to their process as cement manufacturing has developed and improved. The facility has switched from a wet to a dry process, introduced heat recovery methods, and installed a precalcining tower. Improved efficiency has reduced emissions. There do not appear to be any obvious additional modifications of this type that might be undertaken at this time. Add-on emissions control or improvements to existing emissions control devices hold greater potential to reduce emissions in a cost effective manner.

NOx Emissions Control

The formation of NOx during the manufacture of cement is due to the high temperature, oxidizing atmosphere necessary for clinker formation. NOx is primarily formed by two mechanisms: the oxidation of molecular nitrogen in the combustion air or “thermal NOx”; and the oxidation of nitrogen compounds in the fuel or “fuel NOx”. Although the contribution of fuel NOx cannot be discounted, in the high temperature zone of cement kilns, thermal NOx is the dominant contributor to NOx formation. Additionally, some NOx may be formed by oxidation of nitrogen compounds from the raw materials or “feed NOx”, and a small amount of NOx is formed instantaneously at the flame surface or “prompt NOx.” The predominant nitrogen species in cement kiln exhaust gas is NO, at typically up to 90-95 percent, with NO_2 accounting for the remainder.

Emissions of NOx from cement manufacture come primarily from the manner in which fuel is combusted to heat and chemically formulate the cement clinker. These emissions may be reduced by control of the combustion zone temperature and excess air, as well as combustion modifications. These modifications include low NOx burners in both the kiln and precalciner, mixing air systems, fuel addition systems, and staged combustion. In addition, post-combustion controls involving the use of chemical additives to the pollutant stream can further reduce emissions of NOx to the atmosphere. Many of these

methods may be used in combination and some preclude one another or have operational constraints due to the design of the kiln that may limit their efficacy.

A number of post-combustion or add-on control techniques have proven successful at removing NOx in exhaust streams from a variety of industrial combustion sources. These include scrubbing technology utilizing various chemical additives, oxidation technology utilizing hydrogen peroxide, and selective reduction technology utilizing ammonia or urea injection either with or without a catalyst present. The applicability of these add-on NOx controls to the exhaust from cement kilns is somewhat limited by high temperature, high flow rate, and high level of particulate in the exhaust. The cost, availability, and handling requirements of the chemical additives can further restrict their usefulness in this application. The two post-combustion techniques that present the greatest likelihood of successful NOx reduction from cement kiln exhaust are selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR).

Both SNCR and SCR utilize a nitrogen based reducing agent (usually ammonia or urea) to convert NOx into molecular nitrogen (N_2) and water vapor (H_2O). The chemical reactions that accomplish this conversion depend on the reducing agent and the presence of a catalyst. However, the catalyst and the temperature at which the reactions occur is the main difference between SNCR (1600-2000 degrees F) and SCR (570-700 degrees F). Ammonia may be obtained as either anhydrous (dry) or aqueous (mixed with water). Anhydrous ammonia is the most efficient form because it is 100 percent ammonia, but there are significant issues with the transport, handling and storage of anhydrous ammonia. Both U.S. EPA and OSHA classify anhydrous ammonia as a hazardous material. Aqueous ammonia is not a hazardous material but is usually available in concentrations of 19 or 29 percent by weight, so a greater amount is required to achieve the same benefit. Urea is perhaps a safer alternative than anhydrous ammonia, but is about 46 percent nitrogen, so it takes about twice as much mass of urea to provide the same NOx control. Urea is available in dry form or mixed with water at 40 to 50 percent by weight urea solution. Urea solutions are also more viscous than aqueous ammonia so delivery systems must account for this.

Use of either SNCR or SCR would require substantial equipment upgrades as well as operational modifications to any cement manufacturing plant. Operational plans and equipment are required for the delivery, storage, mixing and delivery of the reagent. The complexity of this depends on the form of the reagent used. The performance of these systems is highly dependent on temperature, residence time, and concentration of the applied reagent. Control systems to monitor these variables as well as CEMS for NOx and ammonia are required to determine the optimum conditions to maximize NOx control and minimize emissions of unreacted ammonia. Emissions to the atmosphere of unreacted ammonia resulting from the use of SNCR and SCR are referred to as “ammonia slip” and can result in odor concerns, stack plume visibility problems and secondary PM formation. Additional issues associated with poorly managed SNCR systems at cement plants include the potential for increased emissions of CO, and N_2O (more likely when using urea as a reagent).

SNCR has proven an effective means of NOx control at a number of cement kilns across Europe, Japan, and the United States. As of 2007, over 60 cement plants across Europe utilized SNCR for the control of NOx emissions achieving control efficiencies in excess of 50 percent. Higher NOx reduction efficiencies are possible when SNCR is paired with staged combustion or some other combustion modification. In the United States, the application of SNCR to cement kilns is more recent and initially only proved successful on preheater/precalciner kilns. However, there are currently several cement plants across the country utilizing SNCR including wet kilns, long kilns and those using waste derived fuels. Reported NOx control efficiencies for the U.S. applications run from 12 to 65 percent. Higher efficiencies are generally associated with higher concentrations of ammonia added to the flue gas, and this often results in greater ammonia slip (emissions of unreacted ammonia).

SCR has proven an effective means of NOx control for a variety of combustion sources, from gas turbines at power plants to industrial boilers to diesel locomotives and even automobiles. The application of this technology to cement kilns is much more limited. Primarily, this is due to the high levels of dust (PM) in cement kiln gas at the temperature favorable for SCR use. It is possible to utilize SCR after the PM control device, but the exhaust gases would need to be reheated. SCR requires a catalyst bed, catalyst cleaning system, bypass ducting and periodic replacement of the catalyst, and a significantly higher capital investment over SNCR. In determining emissions levels for the NSPS, EPA considered lower NOx levels based on performance of SCR, but determined that SCR was not "sufficiently demonstrated technology for this industry."

PM Emissions Control

Particulate emissions arise from a variety of activities at cement manufacturing facilities, some of which are amenable to collection and control by add-on systems and some of which are fugitive in nature but which may be reduced by mitigation methods. Dust sources amenable to collection and control include crushing, mixing and storage of raw materials, clinker production and cooling, finish grinding, and packaging. Of these sources, the largest single point of emissions are the stack emissions from the kiln including the feed system, fuel firing, and clinker cooling and handling systems. Fugitive emission come from quarrying and primary crushing of raw materials, storage and handling of raw materials, fuel, clinker, and finished product, and from vehicle traffic.

Fugitive dust emissions are best controlled by efficient site design and lay-out as well as proper maintenance and operation of equipment to reduce spillage and air leakage from collection systems. These can be addressed appropriately in a dust mitigation plan and operation and maintenance plan. Fugitive dust control and mitigation measures include open pile wind protection, use of water spray or chemical dust suppressors, paving, road wetting, and housekeeping requirements, and humidification of stockpiles. Additional measures may include enclosing or encapsulating dusty operations such as grinding, screening and mixing, covering conveyors and elevators, vacuum systems to prevent formation of diffuse dust from spillage during maintenance operations, and flexible

filling pipes for dispatch and loading processes. Particularly dusty operations may require ventilation and collection by a control device similar to that for stack emissions.

Various systems have been employed in the cement industry to control point source or stack emissions in the past, but the predominant means of add-on particulate control currently in use are either fabric filtration (bag houses), electrostatic precipitation (ESP) or a combination of the two (hybrid filters). Hybrid filters are often ESP systems that have been modified to include a bag house in order to extend the useful life of the control device. In some cases a cyclonic separator may be used to remove larger particulate matter upstream of these fine particulate control devices.

Electrostatic precipitators (ESPs) generate an electrostatic field across the path of particulate matter in the air stream. The particles become negatively charged and then migrate to positively charged collection plates downstream of the electrostatic field. The plates are vibrated, tapped or shaken periodically to remove the collected material on a cycle optimized to minimize re-entrainment of the particulate matter. ESPs can operate effectively in conditions of high temperature (up to 750 degrees F) and high humidity. Performance is impaired by particulate build-up on the electrodes forming an insulating layer and thereby reducing the electric field. This is most likely to happen with high chlorine or high sulfur fuel or raw materials forming alkali metal chlorides and sulfates. Explosion risks may also arise in conditions of high CO concentrations in exhaust gas.

Fabric filters are very efficient at dust collection, with the basic principle of a fabric membrane that allows the gas to pass but retains particulate. The most common large scale systems use hanging bags arranged geometrically across the top of a box or chamber, hence the name "bag house." Dust is deposited both on the surface and within the fabric, and in time the dust itself becomes the dominant filtering medium. Periodic cleaning of the fabric membrane is required as dust builds up and resistance to gas flow increases. The most common cleaning methods are compressed air pulsing, reverse airflow, mechanical shaking or vibration. Usually baghouses have multiple chambers that can be isolated in case of bag failure, and to maintain efficiency during the cleaning cycle. Filter bags are available in a variety of woven and non-woven fabrics with some synthetic fabrics that can operate effectively at temperatures above 500 degrees F.

TAC Emissions Control

The TACs addressed in the proposed regulation as well as the federal NESHAP come in a variety of forms, so that control thereof is equally varied. The addition of adsorptive materials to the production process can be utilized to adsorb organic compounds, ammonia and ammonium compounds, HCl, and mercury. The removal of toxic compounds that are emitted in solid form such as lead, beryllium and chrome is also increased slightly by the use of activated carbon. Acidic compounds can be removed through use of scrubbers which either spray caustic liquid into the kiln itself or into a separate reaction chamber downstream of the kiln. Alternatively, dry lime can be utilized in place of the caustic solution. Dioxins and furans are controlled by activated carbon or

through operational controls such as maintaining a lower inlet temperature to the baghouse or other particulate abatement device.

Adsorption addition refers to adding lime or activated carbon to the cement manufacturing process in either a wet or dry form when raw materials are mixed prior to entering the kiln, or directly incorporated into the clinker formation process. The lime may be calcium oxide (CaO) or any of the various chemical and physical forms of quicklime, hydrated lime, or hydraulic lime. Dry scrubbing is another term for the addition of dry CaO and this has already been implemented to a degree at Lehigh. Two raw mills are situated immediately prior to final mixing of the raw materials and test results show a decrease in emissions when these are operating due to the increased addition of pulverized limestone into the flue gas. LSI is a suspension of hydrated lime in water and may be sprayed into the cement kiln flue gas to reduce emissions. Lehigh obtained a permit from the District in 2010 to add LSI to their process (injection point at the last stage of the preheater/precalciner) and the system has been installed and used on a trial testing basis. The facility is awaiting county approval before beginning full scale operation.

Organic compounds, ammonia and ammonium compounds, HCl, mercury, SO_2, and to a lesser extent, residual dust can be removed by adsorption by activated carbon. As stated above, activated carbon can be injected into the cement manufacturing process, or alternatively the kiln gases can be routed to packed beds or filters. In both cases, the saturated carbon is then added to the fuel mix in the kiln. Lehigh applied for a permit from the District to install ACI primarily to reduce emissions of mercury. The installation was completed and ACI was fully operational beginning in May 2011.

SO_2 Emissions and Controls

Similar to NOx, the formation of SO_2 is a product of the chemical make-up of the raw materials and fuel, as well as the high operating temperatures and oxygen concentration in the kiln. The production of SO_2 is more dependent on the sulfur content of fuel and raw materials however, whereas NOx formation is more dependent on combustion effects. Emissions of the two pollutants are interrelated due to the overlap of contributing factors. Process optimization measures are the first step towards reducing SO_2 emissions, including smoothing of kiln operation, choice and homogenization of the raw materials and fuel, and prevention of reducing conditions in the burning process by controlling the amount of available oxygen. When these optimization measures prove insufficient, add-on controls such as adsorption addition, carbon filtration, and wet scrubbing may be employed to further reduce emissions of SO_2.

Wet scrubbing is another means of controlling SO_2 emissions which involves spraying a mixture of calcium carbonate and water countercurrent to the exhaust gas in a tower as an add-on control device. The calcium carbonate reacts to form calcium sulfate dihydrate, which is then separated and can replace gypsum as a modulating agent in the finished cement depending on the properties required. The liquid is recovered and reused in the wet scrubbing tower. Wet scrubbing also removes HCl, residual dust and to a lesser

extent metal and ammonia emissions. This is the most commonly used method of de-sulfurization in coal fired power plants and its use is also well established in cement manufacturing, although more often at facilities where sulfur levels are high in the fuel or raw materials. Limitations on the use of this means of control would be increased energy consumption, increased carbon dioxide (CO_2) emissions, i.e., greenhouse gas emissions, increased water consumption and risk of water contamination, and increased operational costs.

POTENTIAL EMISSION REDUCTIONS

The proposed Regulation 9-13 would limit emissions of NOx to 2.3 pounds per ton of clinker produced. This translates to a reduction in NOx emissions from the kiln of 2 tons per day or a 42 percent reduction over current levels. Lehigh is subject to the NESHAP emission limits and has already taken steps to meet these limits through application of the LSI and ACI systems. Operation of this equipment will have a side-benefit of reducing emissions of SO_2 over previous levels, although it would be difficult to estimate the exact reduction in SO_2 emissions.

The Lehigh kiln currently emits at a rate marginally higher than the proposed standard for PM which is consistent with the 2010 proposed NESHAP standards for existing sources. Compliance with the FDCP provisions of the rule will also help to ensure the continued minimization of fugitive dust emissions. The proposed limit for NOx will decrease the potential for secondary particulate formation, and the proposed standard for ammonia emissions will limit potential secondary particulate formed by increased ammonia emissions resulting from NOx control.

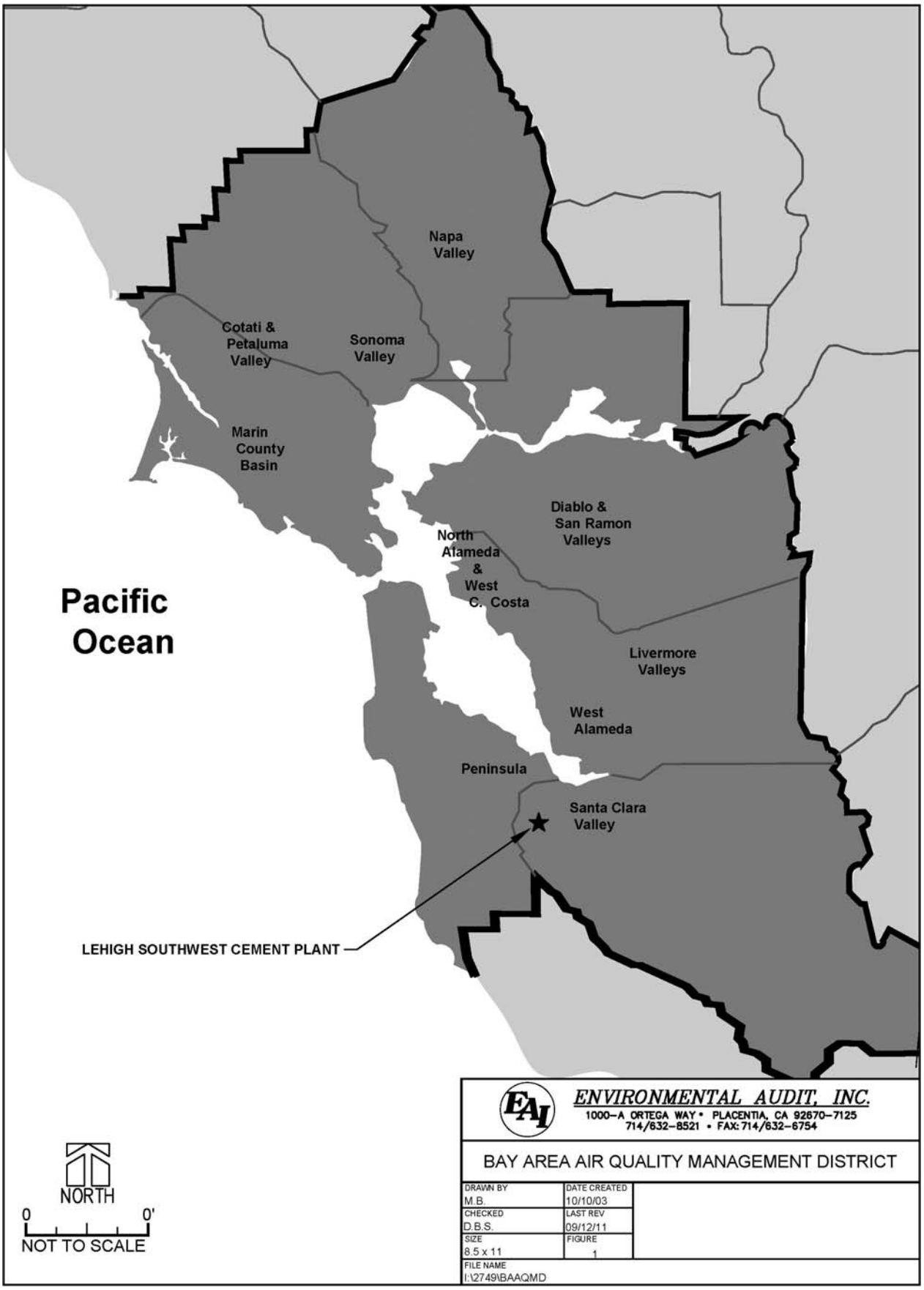
As part of the 2010 Clean Air Plan, District staff developed a multi-pollutant evaluation method (MPEM) to evaluate the benefits of the proposed control measures contained in the plan. This MPEM can be used to calculate the expected resultant reductions in PM2.5 from reductions in PM2.5 precursors: NOx, SO_2, and ammonia based on air quality modeling. The emissions reduction of NOx combined with the proposed ammonia emission standard would be equivalent to a PM2.5 emission reduction of 8.7 tons per year. This number would be slightly increased by the side-benefit reduction in SO_2 emissions mentioned previously.

AFFECTED AREA

The proposed rule amendments would apply to facilities under BAAQMD jurisdiction. The BAAQMD jurisdiction includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma counties (approximately 5,600 square miles (see Figure 1)). The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The

Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys, and bays.

There is only one Portland cement manufacturing facility located in the Bay Area. The Lehigh Southwest Cement Permanente Plant is located in an unincorporated portion of Santa Clara County, west of Cupertino and approximately ten miles south of the most southerly portion of the San Francisco Bay. Lehigh lies to the west of Stevens Creek Boulevard and southwest of Interstate 280 (see Figure 1). The plant is basically surrounded by the Rancho San Antonio Open Space Preserve. It is generally bordered on the north and east by the residential communities of Cupertino, Saratoga and Loyola, and to the west and south by open space that borders the Pacific Ocean.


Napa Valley
Cotati & Petaluma Valley
Sonoma Valley
Marin County Basin
Diablo & San Ramon Valleys
North Alameda & West C. Costa
Pacific Ocean
Livermore Valleys
West Alameda
Peninsula
Santa Clara Valley
LEHIGH SOUTHWEST CEMENT PLANT
NORTH
0 0'
NOT TO SCALE
ENVIRONMENTAL AUDIT, INC.
1000-A ORTEGA WAY • PLACENTIA, CA 92670-7125
714/632-8521 • FAX: 714/632-6754
BAY AREA AIR QUALITY MANAGEMENT DISTRICT
DRAWN BY M.B.
DATE CREATED 10/10/03
CHECKED D.B.S.
LAST REV 09/12/11
SIZE 8.5 x 11
FIGURE 1
FILE NAME I:\2749\BAAQMD

Chapter 3

Environmental Checklist

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed Regulation.

GENERAL INFORMATION

Project Title:	Bay Area Air Quality Management District (BAAQMD) Proposed Regulation 9, Rule 13.
Lead Agency Name:	Bay Area Air Quality Management District
Lead Agency Address:	939 Ellis Street San Francisco, California 94109
Contact Person:	Robert Cave
Contact Phone Number:	415-749-5048
Project Location:	This rule applies to the area within the jurisdiction of the Bay Area Air Quality Management District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
Project Sponsor's Name:	Bay Area Air Quality Management District
Project Sponsor's Address:	939 Ellis Street San Francisco, California 94109
General Plan Designation:	Rule 9-13 applies to Portland cement manufacturing facilities within the District, which tend to be located in industrial areas.
Zoning:	Rule 9-13 applies to Portland cement manufacturers within the District, which tend to be located in industrial areas.
Description of Project:	See “Background” in Chapter 2.
Surrounding Land Uses and Setting:	See “Affected Area” in Chapter 2.
Other Public Agencies Whose Approval is Required:	None

Environmental Factors Potentially Affected:

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed Regulation. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed Regulation. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology / Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☐ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation / Traffic	☐ Utilities / Service Systems	☐ Mandatory Findings of Significance

Determination

On the basis of this initial evaluation:

☒ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: Date:

Printed Name: Date:

Evaluation of Environmental Impacts:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This checklist is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL CHECKLIST AND DISCUSSION

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I.	**AESTHETICS.**				
	Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b)	Substantially damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☑	☐
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d)	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☑	☐

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh Southwest Cement plant (Lehigh) is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Visual resources are generally protected by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

I a. & b. Portland cement manufacturing facilities are mining operations conducted at industrial facilities. Currently, Lehigh is the only facility in the District that manufactures Portland Cement (cement). Lehigh is located in an Urban Service Area west of the City Cupertino. As a result of proposed Regulation 9-13, construction of a new stack for the existing baghouse would be required. The height of the existing stack at Lehigh is approximately 50 feet above grade. The new stack required under Regulation 9-13 would be substantially higher, potentially 300 feet.

The existing cement facility is located within a valley surrounded by hills comprised of open space reserves and parks. The topography of the area surrounding Lehigh leaves the facility predominately surrounded by hills and removed from view from the urbanized area. A new stack (presumably, close to 300 feet) for the baghouse will be visible from outside of the facility in portions of the surrounding community, but is consistent with the industrial nature of the site. There are currently numerous industrial structures at the Lehigh site associated with mining and cement preparation. As such, the new stack, while visible from outside the facility, is not expected to block existing views or substantially change the character of the area.

The nearest scenic highway in relationship to Lehigh is Route 9 from the Santa Cruz county line at Saratoga Gap to the Los Gatos city limit. The nearest point of Route 9 to Lehigh is approximately five miles. Route 9 is not visible from Lehigh due to the distance from the scenic highway and the hilly topography between the two locations. Since no scenic highway is visible from Lehigh, substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway are not expected as a result of the proposed Regulation.

I c. Lehigh will be required to add new air pollution control equipment such as SNCR which could be visible to surrounding areas. A new stack of sufficient height is also required as a result of Regulation 9-13, presumably of approximately 300 feet. The existing Lehigh facility is fairly isolated with limited visual access to the site from surrounding areas. There are currently numerous industrial structures at the Lehigh site associated with mining and cement preparation. New equipment required as a result of the proposed Regulation would be consistent with the industrial nature of the site. Therefore, aesthetic impacts of the proposed Regulation on the site and its surroundings are expected to be less than significant.

I d. The proposed Regulation 9-13 will result in additional structures such as the SNCR or SCR, associated with control and monitoring equipment, and the new stack associate with the existing baghouse. The existing facility is currently lighted for safety considerations. The stack on the existing baghouse is lit, but the new stack will require that lighting to be higher than existing light sources at the facility. The new light could be visible from the nearest residents located more than 1,000 feet from the facility, but the relocated lighting on the new stack will be such that additional glare is not created. Any lights installed to illuminate the site should be designed so as to reflect away from adjoining properties and public thoroughfares, and be compliant with local rules or regulations governing lighting protocols at industrial facilities.

Based upon these considerations, no significant adverse aesthetic impacts are expected from the implementation of the amendments to Regulation 9-13.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact

II. AGRICULTURE and FOREST RESOURCES.

In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.--Would the project:

a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b)	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☑
c)	Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
d)	Result in the loss of forest land or conversion of forest land to non-forest use?				
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Agricultural and forest resources are generally protected by the City and/or County General Plans, Community Plans through land use and zoning requirements, as well as any applicable specific plans, ordinances, local coastal plans, and redevelopment plans.

Discussion of Impacts

II a-e. The proposed Regulation 9-13 would further reduce NOx, PM, TAC and ammonia emissions from cement manufacturers in order to reduce air pollution in the Bay Area and reduce transport of air pollutants to neighboring air basins. The Lehigh facility within the District was first developed as an industrial area in 1939. No agricultural or forest resources exist on the Lehigh site. The Lehigh facility may comply with Regulation 9-13 by using either SCR or SNCR, along with other control technologies and monitoring systems, thus reducing the production of NOx, PM, TAC and ammonia. These changes would be made entirely within the confines of the existing facility. No development outside of the existing cement manufacturing facility would be required by the proposed Regulation 9-13.

With all actions required as a result of Regulation 9-13 occurring within the confines of an existing industrial area, no conversion of existing farmland or forest-land to non-farmland or forest-land is required. There is no conflict with zoning for farmland or forest-land, as well as, no conflict with the Williamson Act contract. Therefore, no significant adverse impacts to agricultural or forest resources are expected as a result of the proposed Regulation.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY.				
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☐	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a non-attainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require emission reductions of NOx, PM, TAC, and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh cement plant, located in an unincorporated area of Santa Clara County, is the only cement facility operation within the jurisdiction of the BAAQMD affected by the proposed rule.

Meteorological Conditions

The summer climate of the West Coast is dominated by a semi-permanent high centered over the northeastern Pacific Ocean. Because this high pressure cell is quite persistent, storms rarely affect the California coast during the summer. Thus the conditions that persist along the coast of California during summer are a northwest air flow and negligible precipitation. A thermal low pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area much of the summer.

In winter, the Pacific High weakens and shifts southward, upwelling ceases, and winter storms become frequent. Almost all of the Bay Area's annual precipitation takes place in the November through April period. During the winter rainy periods, inversions are weak or nonexistent, winds are often moderate and air pollution potential is very low. During winter periods when the Pacific high becomes dominant, inversions become strong and often are surface based; winds are light and pollution potential is high. These periods are characterized by winds that flow out of the Central Valley into the Bay Area and often include tule fog.

Topography

The San Francisco Bay Area is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays. Elevations of 1,500 feet are common in the higher terrain of this area. Normal wind flow over the area becomes distorted in the lower elevations, especially when the wind velocity is not strong. This distortion is reduced when stronger winds and unstable air masses move over the areas. The distortion is greatest when low level inversions are present with the surface air, beneath the inversion, flowing independently of the air above the inversion.

Winds

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate produces a jet that sweeps eastward but widens downstream producing southwest winds at Berkeley and northwest winds at San Jose; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Carquinez Strait, the Golden Gate, or San Bruno Gap.

In winter, the Bay Area experiences periods of storminess and moderate-to-strong winds and periods of stagnation with very light winds. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon and otherwise light and variable winds.

Temperature

In summer, the distribution of temperature near the surface over the Bay Area is determined in large part by the effect of the differential heating between land and water surfaces. This process produces a large-scale gradient between the coast and the Central Valley as well as small-scale local gradients along the shorelines of the ocean and bays. The winter mean temperature high and lows reverse the summer relationship; daytime variations are small while mean minimum nighttime temperatures show large differences and strong gradients. The moderating effect of the ocean influences warmer minimums along the coast and penetrating the Bay. The coldest temperatures are in the sheltered valleys, implying strong radiation inversions and very limited vertical diffusion.

Inversions

A primary factor in air quality is the mixing depth, i.e., the vertical dimension available for dilution of contaminant sources near the ground. Over the Bay Area, the frequent occurrence of temperature inversions limits this mixing depth and consequently limits the availability of air for dilution. A temperature inversion may be described as a layer or layers of warmer air over cooler air.

Precipitation

The San Francisco Bay Area climate is characterized by moderately wet winters and dry summers. Winter rains (December through March) account for about 75 percent of the average annual rainfall; about 90 percent of the annual total rainfall is received in November to April period; and between June and September, normal rainfall is typically less than 0.10 inches. Annual precipitation amounts show greater differences in short distances. Annual totals exceed 40 inches in the mountains and are less than 15 inches in the sheltered valleys.

Pollution Potential

The Bay Area is subject to a combination of physiographic and climatic factors which result in a low potential for pollutant buildups near the coast and a high potential in sheltered inland valleys. In summer, areas with high average maximum temperatures tend to be sheltered inland valleys with abundant sunshine and light winds. Areas with low average maximum temperatures are exposed to the prevailing ocean breeze and experience frequent fog or stratus. Locations with warm summer days have a higher pollution potential than the cooler locations along the coast and bays.

In winter, pollution potential is related to the nighttime minimum temperature. Low minimum temperatures are associated with strong radiation inversions in inland valleys that are protected from the moderating influences of the ocean and bays. Conversely, coastal locations experience higher average nighttime temperatures, weaker inversions, stronger breezes and consequently less air pollution potential.

Air Quality

Criteria Pollutants

It is the responsibility of the BAAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), PM10, PM2.5, sulfur dioxide (SO_2) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3-1. The BAAQMD monitored levels of various criteria pollutants at 23 monitoring stations in 2010. The 2010 air quality data from the BAAQMD's monitoring stations are presented in Table 3-2.

Air quality conditions in the San Francisco Bay Area have improved since the District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically (see Table 3-3). The District is in attainment of the State and federal ambient air quality standards for CO, NOx, and SO_2. The District is not considered to be in attainment with the State PM10 and PM2.5 standards.

The 2010 air quality data from the BAAQMD monitoring stations are presented in Table 3-2. All monitoring stations were below the state standard and federal ambient air quality standards for CO, NO_2, and SO_2. The federal 8-hour ozone standard was exceeded on 9 days in the District in 2010, while the state 8-hour standard was exceeded on 11 days. The Bay Area is designated as a non-attainment area for the California 1-hour ozone standard. The State 1-hour ozone standard was exceeded on 8 days in 2010 in the District. The ozone standards are most frequently exceeded in the Eastern District (Bethel Island (7 days) and Livermore (6 days)), and the Santa Clara Valley (San Martin (8 days), and Gilroy (7 days)) (see Table 3-2).

All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standards were exceeded on two days in 2010, at the San Rafael and Bethel Island monitoring stations. The Air District exceeded the federal PM2.5 standard on 6 days, most frequently in San Rafael in 2010 (see Table 3-2).

TABLE 3-1

Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	0.075 ppm, 8-hour avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hour avg.> 35 ppm, 1-hour avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 ppm, 1-hour avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hour avg.> 0.075 ppm, 1-hour avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 $\mu g/m^3$, annarithmetic mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 24-hour avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, annual arithmetic mean>	15 $\mu g/m^3$, annual arithmetic mean> 35 $\mu g/m^3$, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter> 0.15 ug/m^3, rolling 3-month avg.>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)		Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

TABLE 3-2
Bay Area Air Pollution Summary - 2010

MONITORING STATIONS	OZONE						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM_{10}				$PM_{2.5}$				
	Max 1-hr	Cal 1-hr Days	Max 8-hr	Nat 8-Hr Days	Cal Days	3-Yr Avg	Max 1-hr	Max 8-hr	Nat/ Cal Days	Max 1-Hr	Ann Avg	Nat/ Cal Days	Max 1-hr	Max 24-hr	Nat/ Cal Days	Ann Avg	Max 24-hr	Nat Days	Cal Days	Max 24-hr	Nat Days	3-Yr Avg	Ann Avg	3-Yr Avg
North Counties	(ppb)						(ppm)			(ppb)			(ppb)			(μm^3)				(μm^3)				
Napa	106	1	89	2	2	66	2.3	1.4	0	56.0	9	0	--	--	--	17.4	37	0	0	--	--	--	--	--
San Rafael*	83	0	69	0	0	54	1.7	1.1	0	57.0	12	0	--	--	--	16.7	51	0	1	46.5	4	*	10.7	*
Santa Rosa	84	0	68	0	0	54	2.5	1.1	0	42.0	8	0	--	--	--	--	--	--	--	26.6	0	26	7.2	8.1
Vallejo	91	0	80	1	2	63	2.9	1.9	0	55.0	9	0	11.0	2.4	0	--	--	--	--	29.5	0	31	7.7	9.1
Coast/Central Bay																								
Berkeley*	75	0	49	0	0	44	2.5	1.5	0	53.4	13	0	9.0	2.4	0	21.0	43	0	0	--	--	--	--	--
Oakland	97	1	58	0	0	53	3.0	1.6	0	64.1	13	0	11.0	3.7	--	--	--	--	--	25.2	0	23	7.8	8.9
Oakland West	--	--	--	--	--	--	2.7	1.7	0	68.6	16	0	--	--	--	--	--	--	--					
Richmond	--	--	--	--	--	--	--	--	--	--	--	--	26.0	6.5	0	--	--	--	--	--	--	--	--	--
San Francisco	79	0	51	0	0	47	1.8	1.4	0	92.9	13	0	--	--	--	19.9	40	0	0	45.3	3	26	10.5	10.0
San Pablo*	97	1	81	1	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	--	--	--	--	--
Eastern District																								
Bethel Island	106	3	86	4	7	76	1.4	0.8	0	32.3	6	0	19.0	3.3	0	18.7	70	0	1	--	--	--	--	--
Concord	103	2	87	1	4	74	1.2	1.0	0	42.0	8	0	9.0	2.4	0	13.7	41	0	0	36.4	1	30	7.6	9.0
Crockett	--	--	--	--	--	--	--	--	--	--	--	--	16.3	4.1	0	--	--	--	--	--	--	--	--	--
Fairfield	103	1	81	2	3	69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Livermore	150	3	97	3	6	80	--	--	0	58.4	11	0	--	--	--	--	--	--	--	34.7	0	30	7.6	9.0
Martinez	--	--	--	--	--	--	--	--	--	--	--	--	37.0	5.5	0	--	--	--	--	--	--	--	--	--
South Central Bay																								
Fremont*	120	1	81	1	1	62	*	*	*	*	*	*	--	--	--	--	--	--	--	*	*	*	*	*
Hayward*	*	*	*	*	*	*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Redwood City	113	2	77	1	1	57	3.3	1.7	0	52.7	12	0	--	--	--	--	--	--	--	36.5	1	25	8.3	8.7
Santa Clara Valley																								
Gilroy	94	0	81	5	7	74	--	--	--	--	--	--	--	--	--	--	--	--	--	29.9	0	23	8.2	8.6
Los Gatos	109	2	87	2	3	73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
San Jose Central	126	5	86	3	3	66	2.8	2.2	0	64.0	14	0	4.9	1.8	0	19.5	47	0	0	41.5	3	30	8.8	10.1
San Martin	109	2	87	5	8	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Days over Standard		**8**		**9**	**11**				**0**			**0**			**0**			**0**	**2**		**6**			

* The Fremont site was closed on October 31, 2010; statistics are not available for all but the summer 2010 ozone season. The Berkeley site was closed on December 31, 2010 at the conclusion of a 3-year monitoring study. The San Pablo site was temporarily closed from March 2009 to May 2010 due to damage from a building fire. 2010 statistics are not available except for the summer peak ozone season. 3-year ozone statistics are not available. The Hayward site was temporarily closed in 2010 due to a major construction project adjacent to the site. Annual and 3-year average ozone statistics are not available. $PM_{2.5}$ monitoring began in San Rafael in October 2009. Three-year average $PM_{2.5}$ statistics are not available. A new site was opened in Cupertino on September 1, 2010 for a one-year monitoring study. Due to the brief period of monitoring in 2010, Cupertino data are not shown in this table.

(ppb) = parts per billion (ppm) = parts per million, ($\mu g/m^3$) = micrograms per cubic meter.

TABLE 3-3

Bay Area Air Quality Summary
Days over standards

YEAR	OZONE			CARBON MONOXIDE				NO_X	SULFUR DIOXIDE		PM10		PM2.5
	1-Hr	8-Hr	8-Hr*	1-Hr		8-Hr		1-Hr	24-Hr		24-Hr*		24-Hr**
	Cal	Cal	Nat	Nat	Cal	Nat	Cal	Cal	Nat	Cal	Nat	Cal	Nat
2001	15	-	7	0	0	0	0	0	0	0	0	10	5
2002	16	-	7	0	0	0	0	0	0	0	0	6	7
2003	19	-	7	0	0	0	0	0	0	0	0	6	0
2004	7	-	0	0	0	0	0	0	0	0	0	7	1
2005	9	9	1	0	0	0	0	0	0	0	0	6	0
2006	18	22	12	0	0	0	0	0	0	0	0	15	10
2007	4	9	1	0	0	0	0	0	0	0	0	4	14
2008	9	20	12	0	0	0	0	0	0	0	0	5	12
2009	11	13	8	0	0	0	0	0	0	0	0	1	11
2010	8	11	9	0	0	0	0	0	0	0	0	2	6

* Ozone exceedance days beginning in 2008 reflect new U.S.EPA standard of 0.075 ppm.
** PM2.5 exceedance days beginning in 2006 reflect new U.S.EPA standard of 35 $\mu g/m^3$.

Toxic Air Pollutants

The BAAQMD maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The detailed concentrations of various TACs are reported in the BAAQMD, Toxic Air Contaminant Control Program, 2009 Annual Report (BAAQMD, 2012) and summarized in Table 3-4. The 2009 TAC data show decreasing concentrations of many TACs in the Bay Area. The most dramatic emission reductions in recent years have been for certain chlorinated compounds that are used as solvents including 1,1,1-trichloroethane, methylene chloride, and perchloroethylene. Table 3-4 contains a summary of ambient air toxics listed by compound.

TABLE 3-4

Summary of 2009 BAAQMD Ambient Air Toxics Monitoring Data

Compound	LOD (ppb)[1]	% of Samples < LOD[2]	Max. Conc. (ppb)[3]	Min. Conc. (ppb)[4]	Mean Conc. (ppb)[5]
1,3-butadiene	0.10	88	0.25	0.05	0.039
Acetaldehyde[6]	0.0344*	0	4.26*	0.31*	1.300*
Acetone	0.10	0	16.2	0.3	1.757
Acetonitrile[7]	0.12	29	3.36	0.06	0.726
Benzene	0.02	2	1.14	0.01	0.172
Carbon tetrachloride	0.01	0	0.15	0.09	0.095
Chloroform	0.01	48	0.09	0.005	0.021
Dichloromethane (MeCl)	0.10	45	2.00	0.05	0.155
Ethyl Alcohol[7]	0.39	0	70.6	4.5	15.894
Ethylbenzene	0.04	47	0.68	0.02	0.072
Ethylene dibromide	0.01	100	-	0.005	0.005
Ethylene dichloride	0.10	100	-	0.05	0.05
Formaldehyde[6]	0.0541*	0	5.53*	0.51*	0.054*
Freon 113 (CFC 113)	0.01	0	1.22	0.04	0.01
Methyl chloroform (1,1,1 TCE)	0.02	91	1.79	0.01	0.035
Methyl ethyl ketone	0.10	21	1.68	0.05	0.168
Tetrachloroethylene (Perc)	0.005	43	0.157	0.0025	0.013
Toluene	0.04	0	5.41	0.02	0.571
Trichloroethylene	0.01	90	0.16	0.005	0.009
Trichlorofluoromethane	0.01	0	0.68	0.06	0.283
Vinyl chloride	0.05	100	-	0.025	0.025
m/p-xylene	0.04	5	2.63	0.02	0.301
o-xylene	0.04	29	0.88	0.02	0.101

NOTES: Table 3-4 summarizes the results of the BAAQMD gaseous toxic air contaminant monitoring network for the year 2009. These data represent monitoring results at 19 sites at which samples were collected, except as indicated. Data from the Fort Cronkhite "clean-air" background site was not included. Acetone, ethyl alcohol, Freon 113, and trichlorofluoromethane are not toxic compounds, but are included in the monitoring network.

* Indicates concentration measured in $\mu g/m^3$.

(1) "LOD" is the limit of detection of the analytical method used.

(2) "% of samples < LOD" is the percent of the total number of air samples collected in 2003 that had pollutant concentrations less than the LOD.

(3) "Maximum Conc." is the highest daily concentration measured at any of the 19 monitoring sites.

(4) "Minimum Conc." is the lowest daily concentration measured at any of the 19 monitoring sites. Non-detects reported as one half the LOD concentration.

(5) "Mean Conc." is the arithmetic average of the air samples collected in 2003 at the 19 monitoring sites. One half the LOD (for minimum concentrations) was used to calculate the mean.

(6) Samples collected only at Berkeley and San Jose – Jackson Street stations.

(7) Samples collected only at San Jose – Jackson Street station.

Regulatory Background

Criteria Pollutants

At the federal level, the Clean Air Act (CAA) Amendments of 1990 gave the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the BAAQMD, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

The BAAQMD is governed by a 22-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The BAAQMD is responsible for implementing emissions standards and other requirements of federal and state laws. It is also responsible for developing air quality planning documents required by both federal and state laws.

Toxic Air Contaminants

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific National Emission Standards for Hazardous Air Pollutants (NESHAPs) were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards were to be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed in the following subsections.

Control of TACs Under the TAC Identification and Control Program: California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

Control of TACs Under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with those emissions. Inventory reports must be updated every four years under current state law. The BAAQMD uses a maximum individual cancer risk of 10 in one million, or an ambient concentration above a non-cancer reference exposure level, as the threshold for notification.

Senate Bill (SB) 1731, enacted in 1992 (California Health and Safety Code §44390 et seq.), amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. At a minimum, such facilities must, as quickly as feasible, reduce cancer risk levels that exceed 100 per one million. The BAAQMD adopted risk reduction requirements for perchloroethylene dry cleaners to fulfill the requirements of SB 1731.

Targeted Control of TACs Under the Community Air Risk Evaluation Program: In 2004, BAAQMD established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of toxic air contaminants (TAC) and high exposures of sensitive populations to TAC and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from TAC emission reductions. For example, BAAQMD will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

Discussion of Impacts

III a. The proposed rule would implement SSM-9 of the Bay Area 2010 Clean Air Plan, which indentified Portland cement manufacturing as a potential source of emission reductions of NOx (a precursor of ozone) and secondary fine particulate matter. Because the proposed rule would directly implement a control measure in the 2010 Clean Air Plan, the proposed rule is in compliance with the local air quality plan and is expected to provide beneficial impacts associated with reduced NOx, ozone, PM and TAC concentrations in the Bay Area.

III b. SSM-9 of the 2010 Clean Air Plan committed the BAAQMD to study ways that the emissions limits might be tightened to achieve further NOx and PM emissions reductions from Portland cement manufacturing facilities. The District is considering adoption of Regulation 9-13 to achieve maximum feasible emission reductions of NOx and PM in conjunction with efforts to bring the Lehigh facility into compliance with limits for TACs consistent with the federal NESHAP and NSPS requirements. Additional requirements of the proposed rule address concerns over the present configuration of the emission point from the kiln and the need for an enforceable fugitive dust control plan.

Table 3-5 shows the average daily emissions from the cement kiln at Lehigh according to BAAQMD records for 2010. These values were determined by emission factors assigned by District permit engineers, stack testing, mass balance estimates, and the annual throughput of fuel used and clinker produced as reported by the facility. Lehigh reported that they produced 847 thousand tons of clinker in 2010, a little over half the permitted capacity of 1.6 million tons of clinker per year.

TABLE 3-5

Lehigh Cement Kiln 2010 Emissions

POLLUTANT	AVERAGE EMISSIONS (pounds/day)
Particulate Matter (PM)	32.62
Precursor Organics (POC)	59.2
Nitrogen Oxides (NOx)	9,290
Sulfur Dioxide (SO_2)	2,665
Carbon Monoxide (CO)	5,435
Benzene	16.1
Hydrochloric Acid (HCL)	179
Mercury	0.72
Total Equivalent CO_2 (GHG emissions)	4.08×10^6

The proposed Regulation 9-13 would limit emissions of NOx to 2.3 pounds per ton of clinker produced. This translates to a reduction in NOx emissions from the kiln of and estimated two tons per day or a 48 percent reduction over current levels. Lehigh is subject to the NESHAP emission limits and has already taken steps to meet these limits through application of the LSI and ACI systems. Operation of this equipment will have a side-benefit of reducing emissions of SO_2 over previous levels, although the SO_2 emission reductions are speculative at this time.

The Lehigh kiln currently emits at a rate only slightly above the proposed standard for PM which is consistent with the 2010 amended NESHAP standards for existing sources. Compliance with the fugitive dust control and mitigation measures of the rule will also help to ensure the continued minimization of fugitive dust emissions. The proposed limit for NOx will decrease the potential for secondary particulate formation, and the proposed standard for ammonia emissions will limit potential secondary particulate formed by increased ammonia emissions resulting from NOx control.

As part of the 2010 Clean Air Plan, District staff developed a multi-pollutant evaluation method (MPEM) to evaluate the benefits of the proposed control measures contained in the plan. This MPEM can be used to calculate the emissions equivalence for NOx, SO_2, and ammonia to that of directly emitted PM2.5 in terms of the effect on the average increase in PM2.5 concentration in the air. The emissions reduction of NOx combined with the proposed ammonia emission standard would be equivalent to a PM2.5 emission reduction of 8.7 tons per year. This number would be slightly increased by the side-benefit reduction in SO_2 emissions mentioned previously.

The overall impact of the proposed Regulation 9-13 is a decrease in NOx, PM, and TAC emissions. Therefore, no air quality standard is expected to be violated, and no contribution is expected to be made to an existing or projected air quality violation.

Secondary Particulate Emissions: The Lehigh cement plant is expected to comply with the proposed Regulation 9-13 through the use of SNCR. SNCR uses ammonia as a catalyst, which could result in ammonia slip and secondary particulate formation.

Ammonia slip depends on a variety of factors including space velocity, ammonia to NOx molar ratio, temperature, and NOx inlet concentration. Better technology has allowed operators to control ammonia slip: (1) by ensuring adequate mixing of ammonia in the flue gas to maintain uniform ammonia injection; (2) maintaining the proper ammonia to NOx molar ratio; (3) decreasing the exhaust gas flow rate; (4) maintaining consistent exhaust velocity, and maintaining an optimal temperature regime. The potential for secondary particulate emissions can be alleviated by limiting ammonia slip to no more than 10 ppm, which will minimize the potential for secondary particulate formation to less than significant. In addition, NOx reductions may also reduce ambient levels of fine particulate matter ($PM_{2.5}$) pollution, because a fraction of NOx emissions is ultimately converted to nitrate particles in the atmosphere.

Limiting the ammonia slip to 10 ppm or less above baseline is expected to limit the potential for secondary particulate emission formation to less than significant. Further, the proposed Regulation 9-13 is expected to result in a reduction in NOx emissions and NOx is also a precursor to secondary particulate emissions. Reducing NOx emissions will also reduce secondary particulate formation. To determine the impact of secondary PM2.5 formation as a result of ammonia slip, staff modeled the change in concentration of PM2.5 due to the increase in ammonia and the decrease in NOx. Staff modeled both a 20-day simulation from January, 2007 and a 6-day simulation during PM2.5 exceedance days in January, 2007. In both cases, there was an increase in PM2.5 downwind due to the ammonia and a small, diffuse decrease (0.01 – 0.02 $\mu g/m^3$) in PM2.5 elsewhere due to the NOx conversion to nitric acid which in turn reacts with ambient ammonia. Downwind was south during the 20-day simulation and southwest during the 6-day simulation. The increase in PM2.5 was determined to be no greater than 0.03 $\mu g/m^3$ during the 20-day simulation and no greater than 0.08 $\mu g/m^3$ during the exceedance days simulation. Therefore, the PM2.5 generated by the ammonia slip is less than significant.

III c. CEQA Guidelines indicate that cumulative impacts of a project shall be discussed when the project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065(c). The overall impact of the proposed Rule 9-13 is a decrease in NOx, PM and TAC

emissions and an associated decrease in ozone, PM and TAC concentrations. Therefore, the cumulative air quality impacts of the proposed rule amendments are expected to be beneficial. As iterated above, the cumulative impact of the ammonia emissions (considered in association with other point sources) at the point of maximum impact has been determined to be less than significant.

III d. It is expected that the Lehigh cement plant will use SNCR to reduce NOx emissions. SNCR technology uses ammonia (a toxic air contaminant) as a catalyst and can potentially generate ammonia emissions through ammonia "slip." Rule 9-13 also proposes to limit ammonia slip to 10 ppm above baseline, which is expected to minimize the potential exposure to sensitive receptors so that no significant impacts associated with ammonia use are expected.

III e. The proposed project is not expected to result in an increase in odors. Odors associated with ammonia use in new SNCR systems are expected to be minimal. Ammonia can have a strong odor; however, proposed Regulation 9-13 is not expected to generate substantial ammonia emissions. Ammonia is generally stored in an enclosed pressurized tank, which prevents fugitive ammonia emissions. Ammonia emissions from the stack (also referred to as ammonia slip) will be limited to 10 ppm above baseline as part of the proposed Regulation 9-13 and implemented through permit conditions. Since exhaust emissions are bouyant as a result of being heated, ammonia will disperse and ultimate ground level concentrations will be substantially lower than five ppm. Five ppm is below the odor threshold for ammonia of 20 ppm (OSHA, 2005). Potential odor impacts associated with proposed Regulation 9-13 are not expected to be significant.

Based upon these considerations, no significant adverse air quality impacts are expected from the implementation of proposed Regulation 9-13. In fact, the proposed rule is expected to provide beneficial air quality impacts by reducing NOx and PM emissions and subsequent formation of ozone.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

The area affected by the proposed Regulation is not located in Natural Community Conservation Plan (NCCP) area (as defined by the State's Natural Communities Conservation Program). The area affected by the proposed Regulation located within the boundaries of an existing cement manufacturing facility within the Bay Area. The affected area has been graded to develop various mining and cement manufacturing operations. Native vegetation, other than landscape vegetation, has generally been removed from area. Any new development would fall under compliance with the City or County General Plans.

Regulatory Background

Biological resources are generally protected by the City and/or County General Plans through land use and zoning requirements which minimize or prohibit development in biologically sensitive areas. Biological resources are also protected by the California Department of Fish and Game, and the U.S. Fish and Wildlife Service. The U.S Fish and Wildlife Service and National Marine Fisheries Service oversee the federal Endangered Species Act. Development permits may be required from one or both of these agencies if development would impact rare or endangered species. The California Department of Fish and Game administers the California Endangered Species Act which prohibits impacting endangered and threatened species. The U.S. Army Corps of Engineers and the U.S. EPA regulate the discharge of dredge or fill material into waters of the United States, including wetlands.

Discussion of Impacts

IV a – f. No impacts on biological resources are anticipated from the proposed Regulation which would apply to an existing cement manufacturing facility. Existing and new equipment affected by the proposed Regulation is located within the operating portions of an existing facility, which do not typically include sensitive biological species. The cement manufacturing facility has been graded and developed, and biological resources, with the exception of landscape species, have been removed. Any construction activities associated with the proposed Regulation will be limited to within the boundaries of the existing facility and near existing operations, and no development outside of the existing facility is expected.

Nitrogen deposition refers to the input of reactive nitrogen species from the atmosphere to plants or the soil. Nitrogen deposition can result in eutrophication, or availability of nitrogen-based plant nutrients. This may favor growth of high nitrogen-demand species and may interfere with the uptake of other elements essential to plant life, such as potassium and magnesium. Nitrogen deposition in water may contribute to eutrophication of freshwater or marine systems, where available nitrogen is often a limiting nutrient. Both NOx and ammonia can cause nitrogen deposition, although the effects may differ because of secondary atmospheric reactions that can also result in deposition. This proposed Regulation will reduce NOx emissions and limit ammonia emissions to 10 ppm above baseline. Consequently, the proposal should result in a net decrease to the impacts of any currently occurring nitrogen deposition.

Based upon these considerations, no significant adverse impacts to biological resources are expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☐	☐	☐	☑
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☐	☑
c)	Directly of indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule. This facility has already been graded to develop cement manufacturing operations dating back to 1939. Cultural resources are generally not located in industrial areas that have been developed and active for most of a century.

Regulatory Background

The State CEQA Guidelines define a significant cultural resource as a "resource listed or eligible for listing on the California Register of Historical Resources" (Public Resources Code Section 5024.1). A project would have a significant impact if it would cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5(b)). A substantial adverse change in the significance of a historical resource would result from an action that would demolish or adversely alter the physical characteristics of the historical resource that convey its historical significance and that qualify the resource for inclusion in the California Register of Historical Resources or a local register or survey that meets the requirements of Public Resources Code Sections 50020.1(k) and 5024.1(g).

Discussion of Impacts

V a – d. No impacts on cultural resources are anticipated as a result of the proposed Regulation which would apply to cement manufacturing facilities in the Bay Area. The equipment affected by the proposed Regulation already exists and is located within the confines of an existing operating cement plant. Any modifications to existing equipment and any new equipment would be installed or modified within the boundaries of the existing facility near existing operations. The existing areas have been graded and developed. No new construction would be required outside of the existing facility boundaries or outside of already developed areas due to the adoption of the proposed Regulation 9-13. Therefore, no significant adverse impacts to cultural resources are expected due to the proposed Regulation 9-13.

Based upon these considerations, no significant adverse impacts to cultural resources are expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI.	**GEOLOGY AND SOILS.**				
	Would the project:				
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i)	Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a know fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
ii)	Strong seismic ground shaking?	☐	☐	☑	☐
iii)	Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv)	Landslides?	☐	☐	☐	☑
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c)	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☑
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

The Lehigh plant is located in the natural region of California known as the Coast Ranges geomorphic province. The province is characterized by a series of northwest trending ridges and valleys controlled by tectonic folding and faulting, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone inter-fingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along “active” faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Regulatory Background

Construction is regulated by the local City or County building codes that provide requirements for construction, grading, excavations, use of fill, and foundation work including type of materials, design, procedures, etc. which are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are generally required.

The City or County General Plan includes the Seismic Safety Element. The Element serves primarily to identify seismic hazards and their location in order that they may be taken into account in the planning of future development. The California Building Code is the principle mechanism for protection against and relief from the danger of earthquakes and related events.

In addition, the Seismic Hazard Zone Mapping Act (Public Resources Code §§2690 – 2699.6) was passed by the California legislature in 1990 following the Loma Prieta earthquake. The Act required that the California Division of Mines and Geology (DMG) develop maps that identify the areas of the state that require site specific investigation for earthquake-triggered landslides and/or potential liquefaction prior to permitting most urban developments. The act directs cities, counties, and state agencies to use the maps in their land use planning and permitting processes.

Local governments are responsible for implementing the requirements of the Seismic Hazards Mapping Act. The maps and guidelines are tools for local governments to use in establishing their land use management policies and in developing ordinances and review procedures that will reduce losses from ground failure during future earthquakes.

Discussion of Impacts

VI a. The control equipment associated with the proposed Regulation will be located within the confines of the existing cement manufacturing facility in the Bay Area. New construction activities are expected to be required as a result of adopting the proposed Regulation 9-13. All new structures must be designed to comply with the California Building Code Zone 4 requirements. The local cities and counties are responsible for assuring that new construction complies with the California Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, but with some non-structural damage; and (3) resist major earthquakes without collapse, but with some structural and non-structural damage. The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site.

Any new development at cement manufacturing facilities would be required to obtain building permits, as applicable, for new structures at any site. The issuance of building permits from the local agency will assure compliance with the California Building Code requirements which include requirements for building within seismic hazard zones. No significant impacts from seismic hazards are expected since new development is consistent with the type of existing equipment at the facility and is required to comply with the California Building Code in order to implement proposed Regulation 9-13.

VI b. New equipment will be required by the proposed Regulation 9-13. Any new equipment, or any upgrades to existing equipment, would be installed within the confines of the existing boundaries. Therefore, the proposed Regulation is not expected to result in substantial soil erosion or the loss of topsoil as no major grading activities would be required.

VI c – e. New equipment that may be required due to proposed Regulation 9-13 would be located within the confines of existing cement manufacturing facility. No major grading activities are expected as the Lehigh plant site is already graded. No construction activities are expected to occur on a geologic unit or soil that is unstable or that would become unstable, or potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse. Likewise, no structure would be constructed on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property. Compliance with the California Building Code would minimize the impacts associated with existing geological hazards. Construction would not affect soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater, as the proposed Regulation 9-13 will have no impact on wastewater treatment/disposal systems. Therefore, no adverse significant impacts to geology and soils are expected as a result of the proposed Regulation 9-13.

Based upon these considerations, no significant geology and soils impacts are expected from the implementation of the proposed Regulation.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS.					
Would the project:					
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☑
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☑

Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs identified by the Kyoto Protocol are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. The GHG inventory for California is presented in Table 3-5 (CARB, 2007 and CARB, 2009). Approximately 80 percent of GHG emissions in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (see Table 3-6).

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

TABLE 3-6

California GHG Emissions and Sinks Summary
(Million Metric Tons CO2 Equivalent)

Categories Included in the Inventory	1990 (1)	2006 (2)
ENERGY	**386.41**	**419.32**
Fuel Combustion Activities	**381.16**	**414.03**
Energy Industries	157.33	160.82
Manufacturing Industries & Construction	24.24	19.03
Transport	150.02	184.78
Other Sectors	48.19	49.41
Non-Specified	1.38	2.16
Fugitive Emissions from Fuels	**5.25**	**5.28**
Oil and Natural Gas	2.94	3.25
Other Emissions from Energy Production	2.31	2.03
INDUSTRIAL PROCESSES & PRODUCT USE	**18.34**	**30.22**
Mineral Industry	4.85	5.92
Chemical Industry	2.34	0.37
Non-Energy Products from Fuels & Solvent Use	2.29	1.85
Electronics Industry	0.59	0.77
Product Uses as Substitutes for Ozone Depleting Substances	0.04	13.38
Other Product Manufacture & Use Other	3.18	1.67
Other	5.05	6.25
AGRICULTURE, FORESTRY, & OTHER LAND USE	**19.11**	**25.10**
Livestock	11.67	15.68
Land	0.19	0.19
Aggregate Sources & Non-CO_2 Emissions Sources on Land	7.26	9.24
WASTE	**9.42**	**9.23**
Solid Waste Disposal	6.26	6.31
Wastewater Treatment & Discharge	3.17	2.92
EMISSION SUMMARY		
Gross California Emissions	**433.29**	**483.87**
Sinks and Sequestrations	**-6.69**	**-4.07**
Net California Emissions	**426.60**	**479.80**

Source: (1) CARB, 2007.
(2) CARB, 2009.

Regulatory Background

In response to growing scientific and political concern regarding global climate change, California has adopted a series of laws to reduce both the level of GHGs in the atmosphere and to reduce emissions of GHGs from commercial and private activities within the state.

In September 2006, Governor Schwarzenegger signed California's Global Warming Solutions Act of 2006 (AB32). AB32 required CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions, by January 1, 2008;

- Adopt mandatory reporting rules for significant sources of GHG emissions by January 1, 2008;

- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and,

- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHGs by January 1, 2011.

SB97, passed in August 2007, is designed to work in conjunction with CEQA and AB32. SB97 required the California Office of Planning and Research (OPR) to prepare and develop guidelines for the mitigation of GHG emissions or the effects thereof, including but not limited to, effects associated with transportation and energy consumption. These guidelines have been adopted and became effective March 18, 2010. The OPR and the Resources Agency shall periodically update these guidelines to incorporate new information or criteria established by CARB pursuant to AB32.

There has also been activity at the Federal level on the regulation of GHGs. In *Massachusetts v. Environmental Protection Agency* (Docket No. 05–1120), the U.S. Supreme Court held that the U.S. EPA had authority to regulate greenhouse gases. The U.S. Supreme Court ruled that CO_2 and other greenhouse gases are pollutants under the Clean Air Act, which U.S. EPA must regulate if it determines they pose an endangerment to public health or welfare. On October 30, 2009, the U.S. EPA issued 40 CFR Part 98, which requires reporting of GHG emissions from large sources and suppliers in the United States. Under Part 98, suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to EPA, with abbreviated report required in 2011 (for 2010 emissions), and full reporting in 2012 (for 2011 emissions). Part 98 became effective December 29, 2009.

Discussion of Impacts

VII a and b. Combustion of conventional hydrocarbon fuel results in the release of energy as bonds between carbon and hydrogen are broken and reformed with oxygen to create water vapor and CO_2. CO_2 is not a pollutant that occurs in relatively low concentrations as a by-product of the combustion process; CO_2 is a necessary combustion product of any fuel containing carbon. Therefore, attempts to reduce emissions of greenhouse gases from combustion focus on increasing energy efficiency – consuming less fuel to provide the same useful energy output.

The proposed Regulation 9-13 could result in the addition of SNCR or SCR. The energy requirements for the use of such units are limited to new air blowers, pumps, and a vaporization unit which have relatively small motors (about 100 horsepower) (SCAQMD, 2008 and SCAQMD, 2004). The use of SCR or SNCR equipment would occur at an the

existing Lehigh cement manufacturing facility that already uses electricity and the increase in energy use and related greenhouse gas emissions is expected to be negligible. Further, the Lehigh facility is regulated as part of CARB's GHG program and is under a GHG emission CAP. Therefore, any increase in GHG emissions would be required to be offset by GHG emission reductions.

Based on the above discussion, implementation of the proposed Regulation 9-13 is not expected to result in a significant increase in GHG emissions. Therefore, no significant adverse GHG or climate change impacts are expected due to implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c)	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑	☐
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f)	For a project within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑	☐

Setting

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

The affected cement manufacturing facility does not handle or process large quantities of flammable, hazardous, and acutely hazardous materials. Accidents involving these substances can result in worker or public exposure to fire, heat, blast from an explosion, or airborne exposure to hazardous substances.

The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events.

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at many types of industrial facilities. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

Risks to the public are reduced if there is a buffer zone between industrial processes and residences or other sensitive land uses, or the prevailing wind blows away from residential areas and other sensitive land uses. The Lehigh plant is located in an industrial area.

Regulatory Background

There are many federal and state rules and regulations that facilities handling hazardous materials must comply with which serve to minimize the potential impacts associated with hazards at these facilities.

Under the Occupational Safety and Health Administration (OSHA) regulations [29 Code of Federal Regulations (CFR) Part 1910], facilities which use, store, manufacture, handle, process, or move highly hazardous materials must prepare a fire prevention plan. In addition, 29 CFR Part 1910.119, Process Safety Management (PSM) of Highly Hazardous Chemicals, and Title 8 of the California Code of Regulations, General Industry Safety Order §5189, specify required prevention program elements to protect workers at facilities that handle toxic, flammable, reactive, or explosive materials.

Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.] and Article 2, Chapter 6.95 of the California Health and Safety Code require facilities that handle listed regulated substances to develop Risk Management Programs (RMPs) to prevent accidental releases of these substances, U.S. EPA regulations are set forth in 40 CFR Part 68. In California, the California Accidental Release Prevention (CalARP) Program regulation (CCR Title 19, Division 2, Chapter 4.5) was issued by the Governor's Office of Emergency Services (OES). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program.

Affected facilities that store materials are required to have a Spill Prevention Control and Countermeasures (SPCC) Plan per the requirements of 40 Code of Federal Regulations, Section 112. The SPCC is designed to prevent spills from on-site facilities and includes requirements for secondary containment, provides emergency response procedures, establishes training requirements, and so forth.

The Hazardous Materials Transportation (HMT) Act is the federal legislation that regulates transportation of hazardous materials. The primary regulatory authorities are the U.S. Department of Transportation, the Federal Highway Administration, and the Federal Railroad Administration. The HMT Act requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practical moment (49 CFR Subchapter C). The California Department of Transportation (Caltrans) sets standards for trucks in California. The regulations are enforced by the California Highway Patrol.

California Assembly Bill 2185 requires local agencies to regulate the storage and handling of hazardous materials and requires development of a business plan to mitigate the release of hazardous materials. Businesses that handle any of the specified hazardous materials must submit to government agencies (i.e., fire departments), an inventory of the hazardous

materials, an emergency response plan, and an employee training program. The information in the business plan can then be used in the event of an emergency to determine the appropriate response action, the need for public notification, and the need for evacuation.

Discussion of Impacts

VII a - c. It is expected that the proposed Regulation 9-13 will lead to a reduction in NOx emissions through the installation of SNCR or SCR. SNCRs and SCRs use ammonia or urea to react with NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Safety hazards related to the transport, storage and handling of ammonia exist. Ammonia is considered to be a hazardous chemical. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM10 emissions under some circumstances. Facilities can use either aqueous ammonia or anhydrous ammonia. The EIR prepared for the 2010 CAP evaluated the potential impacts of ammonia use. The main hazard associated with ammonia is associated with a release that generates a toxic cloud and those hazards are summarized below.

On-Site Release Scenario: The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, anhydrous ammonia and aqueous ammonia is regulated under California Health and Safety Code Section 2770.1.

Any new SCR would require the use and storage of ammonia at existing cement manufacturers primarily located in industrial zones. Currently, the existing cement manufacturer in the District does not operate an SNCR or SCR system. Ammonia storage onsite would be a requirement of proposed Regulation 9-13, and limits to the amount of ammonia that can be generated by the facility make up part of the emission limits comprising the Regulation 9-13. The amount of ammonia storage is expected to be the minimum required to operate add-on control equipment installed at the existing facility.

The use and storage of anhydrous ammonia would be expected to result in potentially significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present and the distance from the release. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a

significant vapor cloud. If a release from on-site vessels or storage tanks were to occur, the spill(s) would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that would evaporate, form a vapor cloud, and impact residences or other sensitive receptors (including schools) in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected.

In addition, the following safety design and process standards generally apply to facilities that use and store ammonia:

- The California Code of Regulations, Title 8 – contains minimum requirements for equipment design.

- Industry Standards and Practices – designates codes for design of various equipment, including the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), and National Fire Protection Association (NFPA).

- OSHA passed the Process Safety Management of Highly Hazardous Chemicals rule in 1992 (29 CFR 910.119). This rule was designed to address the prevention of catastrophic accidents at facilities handling hazardous substances, in excess of specific threshold amounts, through implementation of Process Safety Management (PSM) systems for protection of workers. A major PSM requirement is the performance of process hazard analyses to identify potential process deviations and improved safeguards to prevent accidents.

    - A federal EPA Risk Management Program (RMP) and more stringent state RMP program have been developed. The RMP's contain hazard assessments of both worst-case and more credible accidental release scenarios, a five year accident history, an accident prevention program, and an emergency response program.

The standards noted above and other applicable design standards govern the design of mechanical equipment such as pressure vessels, tanks, pumps, piping, and compressors. Adherence to codes minimizes the potential for an ammonia release.

Transportation Release Scenario: If new SNCR or SCR systems are installed, there would be an increase in ammonia transport to the existing cement manufacturing facility. Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to the facility by tanker truck via public roads. The maximum capacity of a tanker truck is about 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49

CFR 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. DOT, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, including ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressures) and migrate from the point of release. There are federal, State and local agencies with jurisdiction over hazardous materials and waste who are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While

compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

Conclusion: Based on the above evaluation and significance criteria, the hazard impacts associated with the use and transport of aqueous ammonia are less than significant. The hazard impacts associated with the use and transport of anhydrous ammonia are potentially significant, but can be mitigated by using aqueous ammonia. Only one facility is expected to add SNCR or SCR equipment as a result of the proposed Regulation 9-13, so no significant increase in the transport of ammonia is expected (no more than one truck per day) within the District. Therefore, the proposed Regulation 9-13 is not expected to generate significant adverse hazard impacts because the increase in ammonia use within the Bay Area is relatively small and limited, and the numerous regulations that exist minimize the potential hazard impacts. Therefore, the impacts of the proposed Regulation on hazards are expected to be less than significant.

VII d. No impacts on hazardous material sites are anticipated from the proposed Regulation 9-13. The affected facility is not located on the hazardous materials sites list pursuant to Government Code Section 65962.5 (DTSC, 2011). The proposed Regulation would have no affect on hazardous materials nor is Regulation 9-13 expected to create a significant hazard to the public or environment. The air pollution control and monitoring equipment associated with proposed Regulation 9-13 are consistent with existing equipment and are located within the confines of the existing cement manufacturing facility in the Bay Area. The proposed Regulation 9-13 neither requires, nor is likely to result in, activities that would affect hazardous materials or existing site contamination. Therefore, no significant adverse impacts on hazards are expected.

VII e – f. No impacts on airports or airport land use plans are anticipated as a result of the proposed Regulation, which would apply to cement manufacturing facilities. Any required facility changes would be located within the confines of the existing cement manufacturing facility. Once the proposed Regulation is implemented, facilities would be expected to comply in the form of air pollution control and monitoring equipment. Additionally, it is proposed that the Lehigh plant add a stack to the existing kiln, of approximately 300 feet in height. These changes are expected to be made with the confines of the existing Lehigh plant. No development outside of existing facilities is expected to be required by the proposed Regulation 9-13. Therefore, no significant adverse impacts on an airport land use plan or on a private air strip are expected.

VII g. No impacts on emergency response plans are anticipated from the proposed Regulation 9-13 which would apply to existing cement manufacturing facilities. Any modifications to the Lehigh facility as a result of the proposed Regulation would occur within the confines of an existing industrial facility. The existing emergency response plan for the Lehigh plant may need to be updated. However, no changes to existing City or

County emergency response plans are expected to be required. Therefore, no significant adverse impacts on emergency response plans are anticipated.

VII h. No increase in hazards related to wildfires is anticipated from the proposed Regulation 9-13. Any changes at the Lehigh plant would be located within the confines of an existing cement manufacturing facility. Native vegetation has been removed from the operating portions of the existing facility to minimize fire hazards. Any changes or additions of equipment will occur within the confines of the existing facility. Therefore, no increase in exposure to wildfires will occur due to the proposed Regulation 9-13.

Based upon these considerations, no significant adverse hazards and hazardous materials impacts are expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY.					
Would the project:					
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☑
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☐	☑
d)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☐	☑
e)	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☑
f)	Otherwise substantially degrade water quality?	☐	☐	☐	☑
g)	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including	☐	☐	☐	☑

	flooding as a result of the failure of a levee or dam?				
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

The affected area is located within the San Francisco Bay Area Hydrologic Basin. The primary regional groundwater water-bearing formations include the recent and Pleistocene (up to two million years old) alluvial deposits and the Pleistocene Huichica formation. Salinity within the unconfined alluvium appears to increase with depth to at least 300 feet. Water of the Huichica formation tends to be soft and relatively high in bicarbonate, although usable for domestic and irrigation needs.

The cement manufacturing facility affected by the proposed Regulation 9-13 is located in an unincorporated area of Santa Clara County west of the City of Cupertino. The affected area is primarily surrounded by rural hills and canyons. Reservoirs and drainage streams are located adjacent to the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

Regulatory Background

The Federal Clean Water Act of 1972 primarily establishes regulations for pollutant discharges into surface waters in order to protect and maintain the quality and integrity of the nation's waters. This Act requires industries that discharge wastewater to municipal sewer systems to meet pretreatment standards. The regulations authorize the U.S. EPA to set the pretreatment standards. The regulations also allow the local treatment plants to set more stringent wastewater discharge requirements, if necessary, to meet local conditions.

The 1987 amendments to the Clean Water Act enabled the U.S. EPA to regulate, under the National Pollutant Discharge Elimination System (NPDES) program, discharges from industries and large municipal sewer systems. The U.S. EPA set initial permit application requirements in 1990. The State of California, through the State Water Resources Control Board, has authority to issue NPDES permits, which meet U.S. EPA requirements, to specified industries.

The Porter-Cologne Water Quality Act is California's primary water quality control law. It implements the state's responsibilities under the Federal Clean Water Act but also establishes state wastewater discharge requirements. The RWQCB administers the state requirements as specified under the Porter-Cologne Water Quality Act, which include storm water discharge permits. The water quality in the Bay Area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

In response to the Federal Act, the State Water Resources Control Board prepared two state-wide plans in 1991 and 1995 that address storm water runoff: the California Inland Surface Waters Plan and the California Enclosed Bays and Estuaries Plan, which have been updated in 2005 as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. San Francisco Bay, and its constituent parts, including Carquinez Strait and Suisun Bay, fall under this category.

The San Francisco Bay Basin Plan identifies the: (1) beneficial water uses that need to be protected; (2) the water quality objectives needed to protect the designated beneficial water uses; and (3) strategies and time schedules for achieving the water quality objectives. The beneficial uses of the Carquinez Strait that must be protected which include water contact and non-contact recreation, navigation, ocean commercial and sport fishing, wildlife habitat, estuarine habitat, fish spawning and migration, industrial process and service supply, and preservation of rare and endangered species. The Carquinez Strait and Suisun Bay are included on the 1998 California list as impaired water bodies due to the presence of chlordane, copper, DDT, diazinon, dieldrin, dioxin and furan compounds, mercury, nickel, PCBs, and selenium.

Discussion of Impacts

VIII a, f. No significant adverse impacts on hydrology and water quality resources are anticipated from the proposed Regulation 9-13, which would apply to the existing Lehigh cement manufacturing facility. The proposed Regulation is not expected to result in an increase in wastewater discharge or result in an increase in water runoff. The site is already developed and operating as a cement manufacturing facility. The proposed emission control equipment is not expected to require water use or wastewater discharge. Therefore, no violation of any water quality standards or waste discharge requirements, and no decrease in water quality is expected from the proposed Regulation 9-13.

VIII b. The emission control technologies (i.e., SNCR and SCR equipment) that would expected to be installed to comply with Regulation 9-13 do not require additional use of water.

Particulate emissions arise from a variety of activities at cement manufacturing facilities. Fugitive emission come from quarrying and primary crushing of raw materials, storage and handling of raw materials, fuel, clinker, and finished product, and from vehicle traffic. Regulation 9-13 would impose an opacity limit of 10 percent opacity lasting for no more than

three minutes in any one hour period from any emission point or miscellaneous operation. . Compliance with this standard will be facilitated through the following dust mitigation control measures:

- Mitigation measures to minimize fugitive dust emissions from disturbed soil, open areas and unpaved roads
- Surface stabilization methods for material storage piles and dust suppression methods for material transfer processes, material handling equipment, housekeeping, and material cleanup
- Track-out prevention and control provisions to minimize dust emissions from paved roads
- Vehicle traffic speed limits
- Provisions to minimize emissions from material transfer and blasting at rock quarries
- Personnel training procedures.

These fugitive dust mitigation measures were derived from the Fugitive Dust Control Plan (FDCP) that Lehigh developed in cooperation with the District, as part of Lehigh's recent Title V permit renewal. Fugitive dust emissions are best controlled by efficient site design and lay-out as well as proper maintenance and operation of equipment to reduce spillage and air leakage from collection systems. These can be addressed appropriately in a dust mitigation plan and operation and maintenance plan. Plan elements may include open pile wind protection, use of water spray or chemical dust suppressors, paving, road wetting, and housekeeping requirements, and humidification of stockpiles. Additional measures may include enclosing or encapsulating dusty operations such as grinding, screening and mixing, covering conveyors and elevators, vacuum systems to prevent formation of diffuse dust from spillage during maintenance operations, and flexible filling pipes for dispatch and loading processes. Particularly dusty operations may require ventilation and collection by a control device similar to that for stack emissions.

If a fugitive dust mitigation measure requires water spray as a dust suppression method, the amount of water required would be minimal as water would be used for dust suppression activities only. As a result, the proposed Regulation is not expected to deplete groundwater supplies or interfere with groundwater recharge. Therefore, no significant impacts on groundwater supplies are expected due to the proposed Regulation 9-13.

Section 10910 of the California Water Code requires preparation of a water supply assessment for certain new development of large residential, commercial, or industrial uses. Specifically, a water supply assessment would be required if a Project included any of the following types of development:

- Proposed residential developments of more than 500 dwelling units; or

- Shopping center or business establishments employing more than 1,000 persons or having more than 250,000 square feet of floor space; or

- Commercial office buildings employing more than 1,000 persons or having more than 250,000 square feet of floor space; or

- Hotels, motels, or both, having more than 500 rooms; or

- Industrial, manufacturing, or processing plants, or industrial parks planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; or

- Mixed-use projects that include one or more of the projects specified in this subdivision; or

- A project that would demand an amount of water equivalent to or greater than the amount of water required by a 500 dwelling unit project.

The estimated demand for a 500 dwelling unit project is 262,820 gpd or about 96 million gallons per year. Water supply assessments typically are required when water use continues over an extended period of time. The proposed Regulation 9-13 does not meet any of the thresholds described above (water use will be less than 96 million gallons per year), and a water supply assessment need not be prepared and incorporated into this Negative Declaration.

VIII c - f. the Lehigh plant is expected to comply with the proposed Regulation 9-13 by incorporating new SNCR or SCR systems, associated upgrades of heater controls and ducting to accommodate these controls, and emission monitoring equipment. All affected equipment would be located in industrial an area, where storm water drainage has been controlled and no construction activities outside of the existing facility is expected to be required. Therefore the proposed Regulation is not expected to substantially alter the existing drainage or drainage patterns, result in erosion or siltation, alter the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite. Nor is the proposed Regulation expected to create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. The proposed Regulation is not expected to substantially degrade water quality. Therefore, no significant adverse impacts to storm water runoff are expected.

VIII g – i. Any new construction or modifications would occur within the confines of the existing cement facility. No construction activities outside the boundaries of the existing Lehigh facility are expected due to the adoption of the proposed Regulation 9-13. The Lehigh cement plant is not located within a 100-year flood zone. Therefore, proposed Regulation 9-13 is not expected to require any additional structures within 100-year flood zones, or other areas subject to flooding. Further, the proposed Regulation would not result in any additional residential

structures, so no housing would be placed within a 100-year flood zone. Therefore, no significant adverse impacts due to flooding are expected.

VIII j. The cement manufacturing facility affected by the proposed Regulation is located in the foothills of Santa Clara County. The facility is located about five miles from the San Francisco Bay and is not susceptible to inundation by seiche or tsunami because of its distance from the ocean. Additional control equipment is expected to be sited near the existing operating portion of the cement facility which is not located near hillsides or areas subject to mud flows. The proposed Regulation is not expected to place any additional structures within areas subject to inundation by seiche, tsunami or mudflow. Therefore, no significant adverse impacts on hydrology/water due to seiche, tsunami or mudflow are expected.

Based upon these considerations, no significant adverse hydrology and water quality impacts are expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:				
a)	Physically divide an established community?	☐	☐	☐	☑
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Land uses in the vicinity of the Lehigh plant are regulated by the County of Santa Clara General Plan through land use and zoning requirements.

Discussion of Impacts

IX a-c. Any new construction or modifications would occur within the confines of the existing Lehigh facility which is an industrial area. No new construction outside of the confines of the existing facility is expected to be required due to the adoption of the proposed Regulation 9-13.

Because all actions resulting from implementation of Regulation 9-13 occur within the confines of the existing cement manufacturing facility, no physical division of an established community is expected. Additionally, no conflict with any applicable land use plan, policy, or regulation is expected as new equipment will be compatible with the existing industrial use of the site.

Based upon these considerations, no significant adverse land use impacts are expected from the implementation of the proposed Regulation 9-13.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Mineral resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

X a-b. The low air pollution control and monitoring equipment associated with the proposed Regulation 9-13 is consistent with existing equipment and are located within the confines of the existing Lehigh plant. Any new construction or modifications would occur within the confines of the existing facility. The proposed Regulation is not associated with any action that would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land

use plan. The proposed Regulation would limit emissions from cement plants but would not increase the use of cement or increase the amount of limestone or other materials mined at the facility. Therefore, no impacts on mineral resources are expected.

Based upon these considerations, significant mineral resource impacts are not expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE. Would the project:					
a)	Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b)	Expose persons to or generate of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c)	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f)	For a project within the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Noise issues related to construction and operation activities are addressed in local General Plan policies and local noise ordinance standards. The General Plans and noise ordinances generally establish allowable noise limits within different land uses including residential areas, other sensitive use areas (e.g., schools, churches, hospitals, and libraries), commercial areas, and industrial areas.

Discussion of Impacts

XI a-d. The proposed Regulation would impose limitations on the NOx, PM, TAC and ammonia emissions from Portland cement manufacturing facilities. Compliance will be achieved through the installation of and new control and monitoring equipment.

The noise environment at the existing cement manufacturing facility is typically dominated by noise from existing equipment onsite, vehicular traffic around the facilities, and trucks entering and exiting the facility premises. Any construction activities required due to the proposed Regulation 9-13 would occur within the confines of the existing facility boundaries. Noise impacts during the construction period are expected to be minimal and occur during daylight hours. Noise related to construction activities would cease following completion of the construction phase.

It is not expected that any modifications to install air pollution control equipment would substantially increase ambient operational noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. Depending on the air pollution control technology installed, replaced, or modified, the operations phase may add new sources of noise to the affected facility. Noise increases associated with SNCR or SCR units are expected to be limited to small motors for air blowers and or pumps. It is expected that the Lehigh facility will comply with all existing noise control laws or ordinances. Further, OSHA and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. These potential noise increases are expected to be small, and thus, less than significant. Therefore, no adverse significant impacts to noise are expected due to the proposed Regulation. Further, the Lehigh facility is located more than one half mile from residential areas so no increase in noise at residential or other sensitive receptor areas is expected.

It is also not anticipated that air pollution control devices or other new equipment will cause an increase in groundborne vibration levels because air pollution control equipment is not typically vibration intensive equipment. Consequently, the proposed Regulation 9-13 will not directly or indirectly cause substantial noise or excessive groundborne vibration impacts.

The proposed Regulation would not substantially increase ambient noise levels from stationary sources, either intermittently or permanently. Therefore, noise impacts are expected to be less than significant.

XI. e-f. The Lehigh plant is not located within an airport land use plan, or within two miles of a public airport or public use airport, or within the vicinity of a private use airstrip, and is not expected to expose people residing or working in the project area to excessive noise levels. Therefore, noise impacts are expected to be less than significant.

Based upon these considerations, significant noise impacts are not expected from the implementation of the proposed Regulation 9-13.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Population and housing growth and resources are generally protected and regulated by the City and/or County General Plans through land use and zoning requirements.

Discussion of Impacts

XII. a. Any construction activities associated with the proposed Regulation at the affected facility are not expected to involve the relocation of individuals, require new housing or commercial facilities, or change the distribution of the population. Workers who will carry out construction activities required at the Lehigh plant to comply with the proposed Regulation 9-13 can be drawn from the existing labor pool in the Bay Area. Further, it is not expected that installing air pollution control equipment will require a substantial increase

in new employees to operate the equipment (an estimated one to two employees). As a result, the proposed Regulation 9-13 is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the district.

XII b-c. Because the proposed Regulation includes modifications and/or changes at an existing facility located within an industrial setting, it is not expected to affect population growth, directly or indirectly induce the construction of single- or multiple-family units, or require the displacement of people or housing elsewhere in the Bay Area.

Based upon these considerations, significant population and housing impacts are not expected from the implementation of the Proposed Regulation 9-13.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. PUBLIC SERVICES. Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☑
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Given the large area covered by the BAAQMD, public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the BAAQMD are provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the BAAQMD. Public facilities within the BAAQMD are managed by different county, city, and special-use districts.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

Discussion of Impacts

XIII a. Implementation of proposed Regulation 9-13 would require new air pollution control equipment at an existing cement manufacturer. The proposed Regulation may result in greater demand for ammonia, which will need to be transported to the Lehigh facility if SNCR or SCR are installed, and stored onsite prior to use. In the event of an accidental release fire departments are typically first responders for control and clean-up and police may need to be available to maintain perimeter boundaries. The proposed Regulation is not expected to significantly affect fire or police departments because of the low probability of accidents during transport and the limited number of facilities (one) that is expected to use SCNR or SCR ad a result of implementing Regulation 9-13. Therefore, the proposed Regulation is not expected to increase the need or demand for additional public services (e.g., fire departments, police departments, government, et cetera) above current levels.

As noted in the "Population and Housing" discussion above, the proposed Regulation is not expected to induce population growth in any way because the local labor pool (e.g., workforce) is expected to be sufficient to accommodate any construction activities that may be necessary at the affected facility and operation of new or modified equipment is not expected to require a substantial increase in employees. Therefore, there will be no increase in local population and thus no impacts are expected to local schools or parks.

Based upon these considerations, significant public services impacts are not expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV.	**RECREATION.** Would the project:				
a)	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b)	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Discussion of Impacts

XIV a-b. As discussed under "Land Use" above, there are no provisions of the proposed Regulation 9-13 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments. No land use or planning requirements will be altered by proposed Regulation 9-13. Any required new equipment, construction, or modifications would occur within the confines of the existing cement manufacturer, so no changes in land use would be required and construction activities would not impact any existing recreational facilities. Further, the proposed

Regulation would not increase the use of existing neighborhood and regional parks or other recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment because the proposed Regulation is not expected to induce population growth. Therefore, no significant adverse impacts on recreation are expected.

Based upon these considerations, significant recreation impacts are not expected from the implementation of the proposed Regulation 9-13.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☑	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established b the county congestion management agency for designated roads or highways?	☐	☐	☑	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☐	☑
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Transportation systems located within the Bay Area include railroads, airports, waterways, and highways. The Port of Oakland and three international airports in the area serve as hubs for commerce and transportation. The transportation infrastructure for vehicles and trucks in the Bay Area ranges from single lane roadways to multilane interstate highways. The Bay Area contains over 19,600 miles of local streets and roads, and over 1,400 miles of state highways. In addition, there are over 9,040 transit route miles of services including rapid rail, light rail, commuter, diesel and electric buses, cable cars, and ferries. The Bay Area also has an extensive local system of bicycle routes and pedestrian paths and sidewalks. At a regional level, the share of workers driving alone was about 68 percent in 2007. The portion of commuters that carpool was about 10 percent in 2007. About 4 percent of commuters walked to work in 2007. In addition, other modes of travel (bicycle, motorcycle, etc.), account for 3 percent of commuters in 2007 (MTC, 2008). Cars, buses, and commercial vehicles travel about 145 million miles a day (2000) on the Bay Area Freeways and local roads. Transit serves about 1.6 million riders on the average weekday (MTC, 2008).

The region is served by numerous interstate and U.S. freeways. On the west side of San Francisco Bay, Interstate 280 and U.S. 101 run north-south. U.S. 101 continues north of San Francisco into Marin County. Interstates 880 and 660 run north-south on the east side of the Bay. Interstate 80 starts in San Francisco, crosses the Bay Bridge, and runs northeast toward Sacramento. Interstate 80 is a six-lane north-south freeway which connects Contra Costa County to Solano County via the Carquinez Bridge. State Routes 29 and 84, both highways that allow at-grade crossings in certain parts of the region, become freeways that run east-west, and cross the Bay. Interstate 580 starts in San Rafael, crosses the Richmond-San Rafael Bridge, joins with Interstate 80, runs through Oakland, and then runs eastward toward Livermore. From the Benicia-Martinez Bridge, Interstate 680 extends north to Interstate 80 in Cordelia. Interstate 780 is a four lane, east-west freeway extending from the Benicia-Martinez Bridge west to I-80 in Vallejo.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

Transportation planning is usually conducted at the state and county level. Planning for interstate highways is generally done by the California Department of Transportation.

Most local counties maintain a transportation agency that has the duties of transportation planning and administration of improvement projects within the county and implements the Transportation Improvement and Growth Management Program, and the congestion

management plans (CMPs). The CMP identifies a system of state highways and regionally significant principal arterials and specifies level of service standards for those roadways.

Discussion of Impacts

XV a-b. Construction activities resulting from implementing the proposed Regulation 9-13 will generate a temporary increase in traffic in the vicinity of the Lehigh plant associated with construction workers, construction equipment, and the delivery of construction materials. The increase in traffic associated with construction activities would be temporary comprising the construction period, and would cease upon completion of construction.

Once construction is completed, the proposed Regulation is not expected to cause a significant increase in traffic at the Lehigh plant. Operation of the cement manufacturing operation is not expected to add a substantial number of new employees (less then three new employees). An increase of a maximum of one truck per day may be required to deliver ammonia if SNCR or SCR equipment is installed. Also, the proposed Regulation is not expected to exceed, either individually or cumulatively, the current level of service of the areas surrounding the affected facility. The work force at the affected facility is not expected to significantly increase as a result of the proposed Regulation and no increase in operation-related traffic is expected. Thus, the traffic impacts associated with the proposed Regulation 9-13 are expected to be less than significant.

XV c. The proposed Regulation is not located within an airport land use plan or within two miles of a public airport or public use airport. Actions that would be taken to comply with the proposed Regulation, such as installing new air pollution control equipment, are not expected to significantly influence or affect air traffic patterns. Further, while the proposed Regulation could lead to the construction of a new 300 feet tall stack on the kiln, the proposed Regulation is not expected to impact navigable air space as the nearest airport is more than five miles from the Lehigh facility. Thus, the proposed Regulation would not result in a change in air traffic patterns including an increase in traffic levels or a change in location that results in substantial safety risks.

XV d - e. The proposed Regulation 9-13 will not alter traffic patterns or existing roadways. The proposed Regulation is not expected to substantially increase traffic hazards or create incompatible uses at the affected facility. All construction activities will occur within the confines of the existing cement manufacturing facility. Aside from the temporary effects due to an increase in traffic associated with construction activities, the proposed Regulation is not expected to alter the existing long-term circulation patterns. The proposed Regulation is not expected to require a modification to circulation, thus, no long-term impacts on the traffic circulation system are expected to occur. The proposed Regulation does not involve construction of any roadways, so there would be no increase in roadway design feature that could increase traffic hazards. Emergency access at the affected facility is not expected to be impacted by the proposed Regulation.

XV f. Construction and operation activities resulting from the proposed Regulation 9-13 are not expected to conflict with policies supporting alternative transportation since the

proposed Regulation does not involve or affect alternative transportation modes (e.g. bicycles or buses) because the construction and operation activities related to the proposed Regulation will occur solely within the confines of one cement manufacturing plant.

Based upon these considerations, significant transportation/traffic impacts are not expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. UTILITIES/SERVICE SYSTEMS. Would the project:					
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?	☐	☐	☐	☑
e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑	☐
g)	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☑	☐

Setting

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies. The affected facility has wastewater and storm water treatment facilities and discharges treated wastewater under the requirements of an NPDES permits. Water is supplied by several water purveyors in the Bay Area. Solid waste is handled through a variety of municipalities, through recycling activities, and at disposal sites.

There are no hazardous waste disposal sites within the jurisdiction of the BAAQMD. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc., in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin.

Implementation of Regulation 9-13 will require reduction of NOx, PM, TAC and ammonia emissions at Portland cement facilities in the Bay Area. The Lehigh plant is the only cement facility operating within the jurisdiction of the BAAQMD affected by the proposed rule.

Regulatory Background

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Discussion of Impacts

XVI a, b, d and e. Compliance with opacity limits associated with the proposed Regulation 9-13 will be facilitated through various provisions derived from Lehigh's Fugitive Dust Control Plan (FDCP) in their Title V permit. Elements include keeping material storage piles, transfer operations, roads and open soil wet or covered. Operational requirements address speed limits, use of a street sweeper and truck wash-outs. Other provisions provide for wind protection and HEPA filter vacuuming any spilled cement dust. If water spray is used as a dust suppression method, the amount of water required would be minimal as water would be used for dust suppression activities only. Any new construction or modifications would occur within the confines of the existing facility. The proposed Regulation 9-13 would not result in the generation of any wastewater at the Lehigh plant. Water consumption would be limited to dust suppression activities and is expected to be minor. Therefore, no impacts on wastewater treatment requirements or wastewater treatment facilities are expected. Further, the proposed Regulation is not expected to generate wastewater or water runoff. Therefore, no significant impacts on wastewater or stormwater facilities are expected due to the proposed Regulation 9-13.

XVI c. The Lehigh plant is expected to comply with the proposed Regulation by the use of air pollution control and monitoring equipment. Therefore, the proposed Regulation 9-13 is not expected to alter the existing drainage or require the construction of new storm water drainage facilities. Nor is the proposed Regulation expected to create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, no significant adverse impacts on storm drainage facilities are expected.

XVI f and g. The proposed Regulation 9-13 would not affect the ability of cement manufacturing facilities to comply with federal, state, and local statutes and regulations related to solid waste. No significant impacts on waste generation are expected from the proposed Regulation as the Lehigh plant is the only affected facility within the jurisdiction of BAAQMD. Waste is expected to be limited to metal, in the event that old equipment is replaced with new equipment.

The proposed Regulation may generate hazardous waste from spent catalyst in SNCR or SCR units. The catalyst has a life expectancy ranging from about five to ten years, depending on the catalyst reaction rate. Spent catalysts are expected to be recycled offsite for their heavy metal content. Therefore, no significant impacts to hazardous waste disposal facilities are expected due to the proposed Regulation. Facilities are expected to continue to comply with all applicable federal, state, and local statutes and regulations related to solid and hazardous wastes.

Based upon these considerations, significant impacts to utilities and service systems are not expected from the implementation of the proposed Regulation 9-13.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII.	**MANDATORY FINDINGS OF SIGNIFICANCE.**				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☐	☐	☑	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☑

Discussion of Impacts

XVII a. The proposed Regulation 9-13 does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist. The proposed Regulation is expected to result in emission reductions from cement manufacturing facilities, thus providing a beneficial air quality impact and improvement in air quality. Further, any modifications would occur within the confines of an existing cement manufacturing facility which has already been graded and disturbed. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources.

XVII b-c. The proposed Regulation 9-13 is expected to result in emission reductions of NOx, PM, TAC and ammonia from affected cement manufacturing facilities, thus providing a beneficial air quality impact through these reductions and ambient ozone concentrations. The proposed Regulation is part of a long-term plan to bring the Bay Area into compliance with the state ambient air quality standards for ozone, thus reducing the potential health impacts due to ozone exposure. The proposed Regulation does not have adverse environmental impacts that are limited individually, but are cumulatively considerable when considered in conjunction with other regulatory control projects. The proposed Regulation 9-13 is not expected to have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly. No significant adverse environmental impacts are expected.

Chapter 4

References

BAAQMD, 2010. Bay Area 2010 Clean Air Plan, September 15, 2010.

BAAQMD, 2011. Bay Area 2010 Clean Air Plan Control Measure SSM-9, BAAQMD Regulation 9, Rule 13: Nitrogen Oxides, Particulate Matter, and Toxic Air Contaminants from Portland Cement Manufacturing, Workshop Report, November 2011.

CARB, 2007. Staff Report; California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit, Appendix A-1, November 16, 2007.

CARB, 2009. "California Greenhouse Gas Inventory for 2000-2006 — Summary by IPCC Category." March 13, 2009.

Department of Toxic Substances Control (DTSC), 2011. Hazardous Waste and Substances Site List. September 9, 2011. http://www.envirostor.dtsc.ca.gov/public/search.asp?cmd=search&reporttype=CORTESE&site_type=CSITES%2COPEN%2CFUDS%2CCLOSE&status=ACT%2CBKLG%2CCOM&reporttitle=HAZARDOUS%20WASTE%20AND%20SUBSTANCES%20SITE%20LIST

OSHA, 2005. Safety and Health Topics, Ammonia Refrigeration. http://www.osha.gov/SLTC/ammoniarefrigeration/.

APPENDIX E

MARCH 29, 2011 LETTER FROM JACK BROADBENT, EXECUTIVE OFFICER OF THE AIR DISTRICT, TO SUPERVISOR LIZ KNISS, SANTA CLARA COUNTY BOARD OF SUPERVISORS

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 29, 2011

Supervisor Liz Kniss
Santa Clara County Board of Supervisors
70 West Hedding Street
San Jose, CA 95110

Re: Dr. Singhal and Synergistic Toxicity

Dear Supervisor Kniss:

In response to your letter dated February 11, 2011, we have reviewed the letter that you received from Dr. Singhal regarding synergistic toxicity. We have researched the topic, including contacting Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA).

In accordance with California Health and Safety Code § 44360, health risk assessments (HRAs) prepared under California's Air Toxics "Hot Spots" Program, must be prepared in accordance with guidelines established by OEHHA. OEHHA's HRA guidelines were initially developed in 2003, and are updated on an ongoing basis. Notable OEHHA HRA guideline updates include revisions to the Technical Support Documents (TSDs) for Non-cancer Reference Exposure Levels, and Cancer Potency Factors, which were adopted on December 19, 2008, and June 1, 2009, respectively, to address the requirements of the Children's Environmental Health Protection Act (SB 25, Escutia 1999).

OEHHA strives to use the best scientific information available in developing their HRA guidelines. However, there is a great deal of uncertainty associated with the process of risk assessment, particularly in quantifying risks from environmental exposures, which are typically much lower than exposures addressed by animal and epidemiological studies. This uncertainty arises from lack of data in many areas necessitating the use of assumptions. The assumptions used in OEHHA's HRA guidelines are designed to err on the side of health protection in order to avoid underestimation of risk to the public. For example, the cancer potency factors used by OEHHA represent the 95th percent upper confidence limits of the slope of the dose response curve, and maximum cancer and non-cancer chronic health risks (for residents) are calculated assuming that an individual will be exposed nearly continuously over a 70-year lifetime at the location of maximum exposure.

Current OEHHA HRA guidelines make the assumption of additivity in addressing multiple chemcical exposures for both cancer and non-cancer risk assessment. With respect to this assumption, OEHHA indicates (for cancer risks):

> "Cancer risks from different substances are treated additively in the Hot Spots Program in part because many carcinogens act through the common mechanism of DNA damage. However, this assumption fails to take into account the limited information on substance interactions. However, the overall uncertainty in the cancer potency factors and the variability in the human population is probably far greater than the uncertainty from the assumption of additivity. In addition, cancers are life threatening serious diseases so it is not unreasonable to consider total additive risk. Therefore, the additive assumption is reasonable from a public health point of view. (*The Air Toxics "Hot Spots" Program Guidance Manual for Preparation of Health Risk Assessments*, Aug. 2003, OEHHA).

Where there are adequate data, assessment of synergistic (greater than additive) toxicity can be conducted. For example, there is ample evidence from epidemiological studies of workers exposed to asbestos that the combination of cigarette smoking and asbestos is far more harmful than either by itself. However, to our knowledge, evidence of synergistic interactions of chemicals at the relatively low exposure levels present in ambient air currently does not exist. OEHHA indicates that the assumption of additivity is therefore most appropriate.

OEHHA staff indicates that they closely follow developments in toxicological and epidemiological research that may warrant revisions to established HRA methodologies. Nonetheless, I would encourage Dr. Singhal to share with OEHHA any technical information that she may have on assessing synergistic toxicity of environmental exposures to chemical mixtures.

Sincerely,

Jack P. Broadbent
Executive Officer/APCO

BB:bb