Review of Refinery Emission Reduction Approaches

Stationary Source Committee
November 24, 2014

Greg Nudd
Rule Development Manager
Board Direction

October 15, 2014 Board Resolution 2014-17 directed staff to:

- Continue the development of Rule 12-15, Refinery Emissions Tracking;

- Prepare companion Rule 12-16, to set emissions thresholds and mitigate potential increases;

- Develop a strategy to reduce emissions from refineries by 20% or as much as feasible.
Overview of Evaluation

Refinery Emission Reduction Approaches Evaluated

- Bay Area RECLAIM (Market-based system as used in South Coast)
- Community-Worker Proposal
- Western States Petroleum Association (WSPA) Proposal
- Periodic Technology Review (staff approach)
- Best Available Retrofit Control Technology (BARCT)/Focused Toxics (staff approach)

Evaluation Criteria

- Health and Safety Code (H&SC) compliance
- Reduction of health risk from toxics
- Reduction of criteria pollutants
- Process transparency/regulatory certainty
- Implementation speed/complexity
- Reduced impact on neighboring communities
- Net reduction of greenhouse gases (GHGs)
Evaluation Criteria

Health and Safety Code (H&SC) Compliance
1. Necessity – A need exists for the regulation;
2. Cost Effectiveness - The regulation must consider cost effectiveness including an analysis of the incremental cost effectiveness of progressively more stringent possible controls;
3. Nonduplication - The regulation does not impose the same requirements as an existing state or federal.

Reduction of Health Risks from Toxics
Includes consideration of relative toxicity, off-site concentrations, ages and sensitivities of exposed individuals

Reduction of Criteria Pollutants
Includes particulate matter (PM), oxides of nitrogen (NO\textsubscript{X}), reactive organic gases (ROG), and sulfur dioxide (SO\textsubscript{2})
Process Transparency/Regulatory Certainty
Ensures that all stakeholders can fully participate in the rule development process, understand how the rule will be implemented and be able to determine if the rule is working as expected.

Technology Forcing
Will the strategy encourage the development of new control technologies?

Implementation Speed/Complexity
Can the strategy be implemented quickly? Will the implementation require a significant, long-term resource commitment by the Air District?

Reduced Impact on Neighboring Communities
Will the neighborhoods around the refineries benefit from the strategy?

Net Reduction of GHGs
Will this result in an overall reduction in greenhouse gas (GHG) emissions considering all of the GHG regulations in place in California?
South Coast AQMD has a program in place to control $\text{NO}_X$ and $\text{SO}_X$ from large sources. The program has the following components:

- Market-based system allowing trading of emission credits.
- Multi-sector program including refineries
- 273 active sources in the program
- Sets overall emissions of these pollutants on a declining path.
- Emission credit availability is adjusted periodically to reflect new BARCT determinations.
- Requires extensive monitoring, reporting, recordkeeping.
- Identifies pollutants contributing to environmental health hazards PM2.5, NO$_x$, SO$_x$, hydrogen sulfide, GHGs, benzene, toluene, xylene, lead, mercury, chromium, arsenic, nickel, vanadium, polycyclic aromatic hydrocarbons
- Defines baseline as three-year average for each pollutant excluding exceedances over regulatory/permitted limits
- Requires each refinery to decrease facility-wide emissions of each pollutant by 20% from baseline by 2020.
- If such progress is infeasible, Best Available Control Technology must be applied to all implicated sources
Western States Petroleum Association (WSPA)

• No specific controls proposed
• Regulatory certainty needed for planning investments
• Follow traditional rulemaking process:
  – Identify control strategies in Clean Air Plan
  – Develop source-category-specific rules through usual rulemaking process (BARCT process)
• Review all significant sources for appropriate control technology on a standard schedule (e.g. every 20 years)

• Begin with sources currently exempt from Best Available Control Technology Requirements (i.e. “grandfathered” sources)

• Applies to all significant sources, not just refinery sources
Best Available Retrofit Control Technology (BARCT)

- Identify specific source categories that are significant polluters.
- Investigate existing controls for these categories and the potential for additional control.
- Evaluate the feasibility of controls considering technical feasibility, emission reductions, and compliance costs.
- The development of the upcoming Clean Air Plan has resulted in the identification of a series of source-category-specific control measures (e.g. NO\textsubscript{X} from turbines, condensable PM from catalytic cracking units).

Focused Toxics

- Adoption of EPA rules from Refinery Risk and Technology Review
- Maximize risk reductions by requiring additional controls on key sources identified in refinery health risk assessments.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Bay Area RECLAIM</th>
<th>Community-Worker</th>
<th>WSPA</th>
<th>Periodic Technology Review</th>
<th>BARCT/ Focused Toxics</th>
</tr>
</thead>
<tbody>
<tr>
<td>H&amp;SC Compliance</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Reduction in health risk from toxics</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Reduction in criteria pollutants</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Process transparency</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Technology forcing</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Implementation speed/complexity</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Reduced impact on neighboring communities</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Net reduction of GHGs</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
## Recommendations

### BARCT Control Measures and Further Study Measures for Key Refinery Sources

<table>
<thead>
<tr>
<th>Project</th>
<th>Expected Benefits</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce SO₂ from coke calciners</td>
<td>Reduce SO₂ emissions</td>
<td>Rulemaking underway</td>
</tr>
<tr>
<td>PM from Fluid Catalytic Cracking Units</td>
<td>Reduce condensable PM and precursor emissions</td>
<td>Rulemaking underway</td>
</tr>
<tr>
<td>Stationary gas turbines</td>
<td>Reduce NOₓ emissions from turbines</td>
<td>Draft control measure for 2015 Clean Air Plan (CAP)</td>
</tr>
<tr>
<td>Further reduce equipment leaks (tanks, valves, other)</td>
<td>Reduce ROG and toxic emissions</td>
<td>Draft control measure for 2015 CAP</td>
</tr>
<tr>
<td>Limit sulfur content of refinery fuel gas</td>
<td>Reduce SO₂ emissions at some refineries</td>
<td>Draft control measure for 2015 CAP</td>
</tr>
<tr>
<td>Further reduce flaring</td>
<td>Reductions in all pollutants</td>
<td>Further study measure for 2015 CAP</td>
</tr>
<tr>
<td>Review of SO₂ emissions from refineries</td>
<td>Determine if substantial SO₂ reductions are available</td>
<td>Further study measure for 2015 CAP</td>
</tr>
<tr>
<td>Further reduce NOₓ</td>
<td>Determine if substantial NOₓ reductions are available</td>
<td>Further study measure for 2015 CAP</td>
</tr>
</tbody>
</table>
Focused Toxics Reduction
• Provide immediate reduction in Air Toxics by vigorous enforcement of new US EPA rules reducing toxics at refineries (final EPA rule expected in May of 2015).
• Conduct site-wide Health Risk Assessments as proposed in Rule 12-15.
• Identify key drivers of health risk from Health Risk Assessment and reduce emissions from those sources to reduce risk.

Global Goals of Strategy
• Aspire to 20% reduction in criteria pollutants and 20% reduction in health risk by 2020.
• Establish collaborative process with all stakeholders to ensure best practices and continuous improvement in emission reductions.
Next Steps

- Present evaluation and recommended strategy to the Board on December 17, 2014.
- Proceed with development of Regulations 12-15 and 12-16.
- Bring rule amendments to implement the emission reduction strategy through the rule development process as a package in 2015.
- Work with the community and industry to implement the strategy.
- Report progress to the Board at regular intervals.
Stationary Source Committee Meeting
Tesoro Refinery Flaring Activity
November 24, 2014
Wayne Kino
Director of Compliance and Enforcement
Outline

- Flare Overview
- Flare Monitoring
- Flare Management
- Tesoro Flare System Overview
- Tesoro Flaring
Flare Overview

- Why Flare?
  - Gas Quantity
  - Gas Quality
  - Emergency Conditions

- Flare Gas Flow Characterization
  - Routine
  - Maintenance
  - Emergency
Typical Flare System

- Asphalt Plant Fire
- Boilers
- Heaters
- Flare Gas
- Compressors
- Flare Gas Treatment System
- Refinery
- Flare
- Water Seal
- Level Indicator
- Knockout Drum
- Pressure Relief Valves
- Vessel Depressurization
- Vapor Recovery, etc.
- Excess Refinery Process Gases/Liquids
- Vent Gas
- To Recovery/Waste System
- Purge Gas
- Pilot Gas
- Steam
- Air Pollution Control Equipment
- Fuel Gas
- Nat Gas
- Vent Gas Flow Meter
- Liquid
- Water Seal
- Level Indicator
- Refinery Flare

Bay Area Air Quality Management District

Slide 4
Flare Monitoring

➤ Regulation 12, Rule 11:

• Monitoring
• Sampling
• Video surveillance
• Reporting of Emissions Data
Flare Management

- Regulation 12, Rule 12:
  - Flare Minimization
  - Notification
  - Causal Analysis
  - Flare Management Plan Updates
Tesoro Flare System

- 6 Flares:
  - North Steam
  - South Steam
  - East Air
  - West Air
  - Coker
  - Emergency
Tesoro Flaring

➢ Maintenance/Turnaround
  • Notifications and Reports
  • Causal Analysis & Prevention
  • Compliance Determination
  • Flare Management Plan Updates
DISCRETIONARY PERMITS UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

Alexander “Sandy” Crockett
Assistant Counsel

Bay Area Air Quality Management District
Stationary Source Committee Meeting
November 24, 2014
What Does It Mean To Be A “Discretionary” Permit Approval Subject To CEQA?

• “Big Picture” Summary
• CEQA Statutory Provisions
• CEQA Guidelines (OPR regulations)
• Court Cases Addressing “Discretionary” vs. “Ministerial” Projects
• Examples from Air District Regulatory Requirements
“Big Picture” Summary

• CEQA Applies To “Discretionary” Projects:
  – Projects where the agency uses its professional judgment in determining how the regulations apply to the project and what they require;
  – Projects where reasonable minds can differ about how the regulations apply and what they require;
  – Projects where the agency must make policy decisions about whether the project is a good idea.

• CEQA Does Not Apply to “Ministerial” projects:
  – Projects where approval is based on fixed, objective standards such as numerical emissions limits;
  – Projects where there is no room for differences in professional opinion about whether a project complies with the applicable regulations;
  – Projects where the agency does not decide on the wisdom or appropriateness of the project.
CEQA Statutory Provisions

- CEQA Applies Only To “Discretionary” Projects
- CEQA Does Not Apply to “Ministerial” Projects
  - CEQA § 21080(b)(1): (b) “This division does not apply to any of the following activities: (1) Ministerial projects proposed to be carried out or approved by public agencies.”

- But CEQA Itself Does Not Define These Terms
OPR CEQA Guidelines

- Guidelines for implementing CEQA issued by Office of Planning and Research (OPR)
- Set forth in Title 14 of the California Code of Regulations
- Not binding, but highly influential in interpreting CEQA
CEQA Guidelines Defining “Discretionary”:

• “[R]equires the *exercise of judgment or deliberation* when the public agency or body decides to approve or disapprove a particular activity.” (§ 15357)

• “[S]ituations where a governmental agency can use its *judgment in deciding whether and how to carry out or approve a project.*” (§ 15002(i))
CEQA Guidelines (cont’d)

CEQA Guidelines Defining “Ministerial”:

• Decisions involving:
  – “only the use of fixed standards or objective measurements, and the public official cannot use personal, subjective judgment in deciding whether or how the project should be carried out.” (§ 15369)
  – “little or no personal judgment by the public official as to the wisdom or manner of carrying out the project.” (§ 15369)

• Situations where:
  – “the law requires a governmental agency to act on a project in a set way without allowing the agency to use its own judgment.” (§ 15002(i))
  – “the [agency] merely has to determine whether there has been conformity with applicable statutes, ordinance, or regulations.” (§ 15367)
  – The agency “merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision.” (§ 15369)
• **Ministerial** — Fixed Standards
  - 15-foot setback requirements
  - 50-foot height limits
  - 3-story building size limits

• **Discretionary** — Open-Ended Standards
  - “adequate” water supply
  - “satisfactory” sewage disposal
  - “sufficient” lighting
  - “well-drained and graded” site
  *(People v. Dept. of Housing & Community Development (1975) 45 Cal.App.3d 185.)*
• “[T]he touchstone is whether the approval process allows the government to shape the project in any way which could respond to any of the concerns which might be identified in an environmental impact report.”

(Friends of Westwood, Inc. v. City of Los Angeles (1987) 191 Cal.App.3d 259, 267.)

• Permit conditions “do not render a project discretionary” (unless the agency can use them to force changes to the project).

Examples from Air District Regulations

• **Discretionary:** Applying “Best Available Control Technology” at a Major Facility

  For any new or modified source, the more stringent of:
  
  – The *most effective* emission control device or technique *which has been successfully utilized for the type of equipment* comprising such a source; or

  – The *most stringent emission limitation achieved* by an emission control device or technique *for the type of equipment* comprising such a source; or

  – Any emission control device or technique *determined* to be *technologically feasible* and *cost-effective* by the APCO.

  (Air Dist. Reg. 2-2-206; see also Air Dist. Reg. 2-2-301.)
• **Ministerial:** NOx Limits for Heat Transfer Operations

A person shall not emit, from any existing heat transfer operation designed for a maximum heat input of 1850 GJ (1.75 billion BTU) per hour or more, nitrogen oxides in excess of

- 175 ppm when gaseous fuel is burned or
- 300 ppm when liquid fuel is burned.

(Air Dist. Reg. 9-3-301.)