PERFORMANCE AUDIT
OF THE

AIR QUALITY DIVISION

DEPARTMENT OF ENVIRONMENTAL QUALITY

January 1998

76-142-96

EXECUTIVE DIGEST

AIR QUALITY DIVISION

INTRODUCTION

This report, issued in January 1998, contains the results of our performance audit* of the Air Quality Division, Department of Environmental Quality (DEQ).

AUDIT PURPOSE

This performance audit was conducted as part of the constitutional responsibility of the Office of the Auditor General. Performance audits are conducted on a priority basis related to the potential for improving effectiveness and efficiency* .

BACKGROUND

DEQ's stated mission* is to drive improvements in environmental quality for the protection of public health and natural resources to benefit current and future generations. This is to be accomplished through effective administration of agency programs, providing for the use of innovative strategies, while helping to foster a strong and sustainable economy.

The Division annually receives approximately 1,100 new source* review (NSR) permit applications. As of June 1, 1997, the Division had 205 employees. Division expenditures for fiscal year 1995-96 were $16.9 million.

** See glossary on page 36 for definition.*

AUDIT OBJECTIVES, CONCLUSIONS, AND NOTEWORTHY ACCOMPLISHMENTS

Audit Objective: To assess the effectiveness of the Division in meeting its mission to regulate sources of air pollutants to minimize adverse impact on human health, the environment, and society.

Conclusion: We concluded that the Division's regulatory functions were generally effective in minimizing adverse impact on human health, the environment, and society. However, we noted reportable conditions* relating to the development of quantified goals* and objectives*, monitoring of contractor, timely processing and district staff approval of NSR permits, timeliness of enforcement activities, complaint investigations, and compliance inspections (Findings 1 through 7).

Noteworthy Accomplishments: In April 1995, the United States Environmental Protection Agency (U.S. EPA) designated the Detroit/Ann Arbor area as being in attainment* with the ozone standard, making it the largest metropolitan area in the nation to achieve that status.

In the U.S. EPA Office of Inspector General audit report entitled "Region 5's Air Enforcement and Compliance Assistance Program," dated September 13, 1996, the Division was commended for its use of penalties, specifically those based on economic benefit* that companies received by not complying with applicable air pollution laws and regulations, to deter companies from violations. During the last three fiscal years, judgments and settlements paid to the State for noted air violations have increased from $1,494,134 in fiscal year 1993-94, to $1,741,581 in fiscal year 1994-95, to $2,554,567 in fiscal year 1995-96. The other three Region 5 states reviewed

* *See glossary on page 36 for definition.*

by the U.S. EPA in its report did not usually assess the economic benefit component.

Audit Objective: To assess the efficiency of the Division's permitting, air quality monitoring, and enforcement processes.

Conclusion: We concluded that the Division's permitting, air quality monitoring, and enforcement processes were generally efficient.

Noteworthy Accomplishments: The Division eliminated its backlog of NSR permit applications that were received but not acted upon, which had peaked at nearly 900 in April 1993.

AUDIT SCOPE AND METHODOLOGY

Our audit scope was to examine the program and other records of the Air Quality Division. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures as we considered necessary in the circumstances.

Our audit procedures included examinations of the Division's records and activities covering the period October 1, 1994 through January 31, 1997.

We studied legislation, administrative rules, management plans, Division policies and procedures, and other Division reports and manuals. We interviewed program staff at both the central office and the district offices.

We reviewed air monitoring reports completed by both the Division and the U.S. EPA to determine if the Division's

efforts had a positive impact on the ambient air* quality in the State. We examined the air monitoring site audit schedule and tested monitoring site accuracy audits to verify their completion. We analyzed the Division's procedures to ensure that source emission data was reported in a timely manner.

We examined records relating to a sample of NSR permit applications to determine if the permits were processed in a timely manner and in accordance with statutory requirements and Division procedures. We reviewed a sample of escalated enforcement* cases for compliance with State and federal requirements and timeliness of resolution.

We visited 3 of the Division's 9 district offices (Cadillac, Grand Rapids, and Jackson) to discuss field district activities with the district supervisor and program staff. We tested a sample of files of source inspections, complaint investigations, and violations for compliance with specified requirements, established procedures, and timeliness of completion. We accompanied district staff on source inspection and complaint investigation visits.

AGENCY RESPONSES AND PRIOR AUDIT FOLLOW-UP

Our audit report contains 7 findings and 12 recommendations. DEQ's preliminary response indicated that it agreed with all 12 recommendations.

DEQ had complied with 11 of the 17 prior audit recommendations included within the scope of our current audit. Two of the prior audit recommendations were repeated in this audit report, and 4 were rewritten because of changes in the individual situations.

* *See glossary on page 36 for definition.*

Mr. Russell J. Harding, Director
Department of Environmental Quality
Hollister Building
Lansing, Michigan

Dear Mr. Harding:

This is our report on the performance audit of the Air Quality Division, Department of Environmental Quality.

This report contains our executive digest; description of agency; audit objectives, scope, and methodology and agency responses and prior audit follow-up; comments, findings, recommendations, and agency preliminary responses; a description of the six principal pollutants, presented as supplemental information; and a glossary of acronyms and terms.

Our comments, findings, and recommendations are organized by audit objective. The agency preliminary responses were taken from the agency's responses subsequent to our audit fieldwork. The *Michigan Compiled Laws* and administrative procedures require that the audited agency develop a formal response within 60 days after the release of the audit report.

We appreciate the courtesy and cooperation extended to us during this audit.

Sincerely,

Thomas H. McTavish, C.P.A.
Auditor General

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DEPARTMENT OF ENVIRONMENTAL QUALITY

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Description of Agency

Act 348, P.A. 1965 (Sections 336.11 - 336.36 of the *Michigan Compiled Laws*), established the Michigan Air Pollution Control Commission (MAPCC) and empowered it to regulate air pollution in the State of Michigan. Following the State's passage of air pollution legislation, the United States Congress enacted the Clean Air Act of 1970 and the Clean Air Act Amendments (CAAA's) of 1977, which provide for control of air pollutants commonly found throughout the United States that were believed to pose the greatest overall threat to air quality.

National air quality standards were established for six principal pollutants: carbon monoxide, lead, nitrogen dioxide, ozone (smog), particulate matter (small airborne particles of dust or debris), and sulfur dioxide (see description of the six principal pollutants, presented as supplemental information). These standards were primarily established to protect people's health with some margin of safety. Each state was required to monitor air quality to determine compliance with the national standards and to submit plans to the United States Environmental Protection Agency (U.S. EPA) to control these six pollutants. The United States Congress also enacted the CAAA's of 1990, the requirements of which were incorporated by the State into Act 451, P.A. 1994 (the Natural Resources and Environmental Protection Act, being Sections 324.101 - 324.5708 of the *Michigan Compiled Laws*).

Section 299.13 of the *Michigan Compiled* Laws (Executive Reorganization Order 1991-22*)* transferred the authority of the MAPCC to the director of the Department of Natural Resources (DNR) effective September 2, 1993 and abolished the MAPCC. Section 324.99903 of the *Michigan Compiled Laws* (Executive Reorganization Order 1995-16 and Executive Order 1995-18) created the Department of Environmental Quality (DEQ) and transferred the authorities and responsibilities of DNR to DEQ effective October 1, 1995. The Air Quality Division, within DEQ, administers the State's Air Pollution Control Program.

For fiscal year 1995-96, the Division's stated mission was to regulate sources of air pollutants to minimize adverse impact on human health, the environment, and society. Beginning in fiscal year 1996-97, DEQ eliminated individual missions for each division and established a departmentwide mission. DEQ's stated mission is to drive

improvements in environmental quality for the protection of public health and natural resources to benefit current and future generations. This is to be accomplished through effective administration of agency programs, providing for the use of innovative strategies, while helping to foster a strong and sustainable economy.

Most of the Division's regulatory activities involve monitoring and controlling air pollution from major sources* . There are approximately 700 major sources within the State that the Division regulates.

The Division consists of five sections and one unit. The five sections are:

1. Administration Section - The Administration Section handles the Division's accounting, administrative, and grant management functions. Beginning in 1994, the Administration Section became responsible for invoicing, receiving, and processing the annual fees required by the Title V Renewable Operating Permit (ROP) Program. In addition, the Administration Section provides technical support for information processing throughout the Division.

2. Air Quality Evaluation Section - The Air Quality Evaluation Section's primary focus is to monitor the ambient air in the State, identify actual and potential exceedances of the minimum air quality standards, and develop and test strategies to maintain or attain minimum air quality standards.

   The Air Quality Evaluation Section is responsible for administering the Michigan Air Sampling Network (MASN), which is designed to measure the air quality throughout the State. MASN consists of over 200 monitoring sensors in 27 counties and is operated by the Section in conjunction with city or county agencies and industries. The Section verifies, analyzes, and collates all data collected by MASN. Industries submit air monitoring data to the Section voluntarily or under agreement or order. Data collected and reported must meet minimum quality assurance requirements established by the Section and the U.S. EPA. The data obtained from these monitors is used by the Division and the U.S. EPA to determine compliance with National Ambient Air Quality Standards.

* *See glossary on page 36 for definition.*

The Air Quality Evaluation Section also maintains the Emissions Inventory System. This system tracks all sources who meet or exceed established threshold levels for criteria pollutants, as well as sources required to report emissions or compliance status in accordance with the Michigan Administrative Code or federal Clean Air Act requirement. This information is submitted to the U.S. EPA annually and is also used by the Administration Section to determine the appropriate fees due the Division from each source under the ROP Program.

In addition, the Air Quality Evaluation Section reviews and interprets weather conditions to determine what impact they may have on emissions. Also, the Air Quality Evaluation Section administers the Emission Trading Program, a market-based program which provides incentives for sources to reduce emissions beyond any applicable requirement and improve air quality.

3. Compliance and Enforcement Section - The Compliance and Enforcement Section is primarily responsible for monitoring and resolving violations of State and federal requirements. Most violations are identified as a result of source inspections and complaint follow-up conducted by the district offices within the Field Operation Section. Once a violation has been identified, the Compliance and Enforcement Section logs in and tracks the violation until an acceptable resolution is attained. Many of the violations can be resolved by the Field Operation Section district office staff.

   All violations are evaluated by the Compliance and Enforcement Section to determine if escalated enforcement activities are warranted. If escalated enforcement activities are warranted, the Compliance and Enforcement Section staff will lead in the negotiations with the violator to obtain an acceptable resolution.

   All violations are also screened in the Compliance and Enforcement Section to determine if a significant violation* has occurred. The Division is required to report all significant violations to the U.S. EPA on a monthly basis, including a status update of all unresolved significant violations. In some cases, the lead in resolving violations may transfer to and from the U.S. EPA depending on varying

** See glossary on page 36 for definition.*

circumstances. While the U.S. EPA is concerned with violations of only federal requirements, the Compliance and Enforcement Section is concerned with violations of both State and federal requirements.

The Compliance and Enforcement Section provides assistance in legal matters brought by and/or against the Division that involve air quality concerns. In addition, the Compliance and Enforcement Section consists of specialists located centrally who provide specialized assistance as needed to the Field Operation Section district office staff. These individuals specialize in many areas, including stack* testing, laboratory sampling, in-stack monitoring, hazardous waste clean-ups, and asbestos demolition and renovation activities.

4. Field Operation Section - The Field Operation Section consists of nine district offices under the supervision of the field operation coordinator. Many air quality functions have been delegated to the district offices to enable field operation staff to provide faster and more efficient service. Field operation staff are often the first line contact for both the industrial public and the general public with questions, concerns, and complaints.

   Field operation staff conduct approximately 700 U.S. EPA-required source inspections annually to determine compliance with State and federal requirements. Also, field operation staff respond to approximately 1,500 complaints annually, as well as assist in providing enforcement for approximately 350 noted violations annually. In addition, field operation staff provide technical assistance to central office staff on permitting issues, including site reviews for some sources prior to new source review (NSR) permit approval.

   In 1995, the Division initiated Michigan's ROP Program for all major sources and certain non-major sources as mandated by the Title V Clean Air Act Amendments of 1990. The Division estimates that this program will affect approximately 700 sources once fully implemented. The primary purpose of this new permit program is to consolidate and clarify the air pollution control requirements which apply to a source and to provide for adequate monitoring, recordkeeping, and reporting to ensure compliance with those requirements.

** See glossary on page 36 for definition.*

Michigan's ROP program received interim approval from the U.S. EPA effective February 10, 1997. ROP's are renewable every five years after issuance, with NSR permits being incorporated into existing ROP's using the following three procedures, depending on the circumstances: (1) administrative permit amendments, (2) minor permit modifications, and (3) significant permit modifications. Field operation staff have primary responsibility for the administration of the ROP Program. The Division's interim approval from the U.S. EPA allowed for a four-year phase-in period for all sources. The Division plans to have all approved ROP's issued by February 2000.

5. Permit Section - The Permit Section is primarily responsible for the technical review of NSR permits (also referred to as "permits to install"). The NSR permit is for new processes or process equipment and modifications of existing equipment that result in a change in emissions. The NSR permit has general and special conditions that must be met in order for a facility to be in compliance. A new permit is required if there is a significant change in a source's process or process equipment.

   The Division annually receives approximately 1,100 NSR permit applications. Review of an application includes a technical review by a Permit Section engineer and in some cases requires a site evaluation, which is completed by Field Operation Section district staff. After internal processing is completed, the NSR permit is developed. This permit contains stipulations and conditions necessary to ensure that the proposed source will comply with all applicable State, federal, or other regulations in effect at the time the permit is issued and will operate in an environmentally safe and acceptable manner.

   NSR permits can have federally enforceable provisions that restrict the potential to emit so that a source can avoid being classified as major. This could allow a company to be exempt from the ROP Program. The Permit Section played a key role in the development of the ROP Program.

   The Permit Section also has primary responsibility for the Clean Corporate Citizen Program (CCCP), which is built on the concept that facilities which consistently demonstrate a strong environmental ethic and stewardship can be relied upon to successfully carry out their environmental protection responsibilities without

rigorous oversight. These facilities would then enjoy greater permitting flexibility than those that have not demonstrated that level of environmental awareness. Eligibility for CCCP is determined by DEQ's Environmental Assistance Division.

The Toxic Unit provides technical expertise related to potentially toxic discharges into the ambient air apart from the six principal pollutants, including toxicology assessments and analysis of atmospheric deposition. The Toxic Unit also provides assistance with permitting issues and special projects.

As of June 1, 1997, the Division had 205 employees. Division expenditures for fiscal year 1995-96 were $16.9 million.

Audit Objectives, Scope, and Methodology and Agency Responses and Prior Audit Follow-Up

Audit Objectives

Our performance audit of the Air Quality Division, Department of Environmental Quality, had the following objectives:

1. To assess the effectiveness of the Division in meeting its mission to regulate sources of air pollutants to minimize adverse impact on human health, the environment, and society.

2. To assess the efficiency of the Division's permitting, air quality monitoring, and enforcement processes.

Audit Scope

Our audit scope was to examine the program and other records of the Air Quality Division. Our audit was conducted in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States and, accordingly, included such tests of the records and such other auditing procedures as we considered necessary in the circumstances.

Audit Methodology

Our audit procedures were conducted during the months of June 1996 through January 1997 and included examinations of the Division's records and activities covering the period October 1, 1994 through January 31, 1997.

We studied legislation, administrative rules, management plans, Division policies and procedures, and other Division reports and manuals. We interviewed program staff at both the central office and the district offices.

We reviewed air monitoring reports completed by both the Division and the United States Environmental Protection Agency (U.S. EPA) to determine if the Division's efforts had a positive impact on the ambient air quality in the State. We also reviewed U.S. EPA monitoring reports for compliance with federal requirements. We examined the air monitoring site audit schedule and tested monitoring site accuracy audits to

verify their completion. We analyzed the Division's procedures to ensure that source emission data was reported in a timely manner.

We obtained data from the Division's permit application tracking system. We used this data to analyze the timeliness of new source review (NSR) permit issuance. We examined records relating to a sample of NSR permit applications to determine if the permits were processed in a timely manner and in accordance with statutory requirements and Division procedures.

We reviewed a sample of escalated enforcement cases for compliance with State and federal requirements and timeliness of resolution.

We visited 3 of the Division's 9 district offices (Cadillac, Grand Rapids, and Jackson) to discuss field district activities with the district supervisor and program staff. We tested a sample of files of source inspections, complaint investigations, and violations for compliance with specified requirements, established procedures, and timeliness of completion. We accompanied district staff on source inspection and complaint investigation visits. We reviewed the selection process for source inspections and tested files for source inspection reports.

Agency Responses and Prior Audit Follow-Up

Our audit report contains 7 findings and 12 recommendations. DEQ's preliminary response indicated that it agreed with all 12 recommendations.

The agency preliminary response which follows each recommendation in our report was taken from the agency's written comments and oral discussion subsequent to our audit fieldwork. Section 18.1462 of the *Michigan Compiled Laws* and Department of Management and Budget Administrative Guide procedure 1280.02 require DEQ to develop a formal response to our audit findings and recommendations within 60 days after release of the audit report.

The Department had complied with 11 of the 17 prior audit recommendations included within the scope of our current audit. Two of the prior audit recommendations were repeated in this audit report, and 4 were rewritten because of changes in the individual situations.

COMMENTS, FINDINGS, RECOMMENDATIONS, AND AGENCY PRELIMINARY RESPONSES

EFFECTIVENESS IN MINIMIZING ADVERSE IMPACT ON HUMAN HEALTH, THE ENVIRONMENT, AND SOCIETY

COMMENT

Audit Objective: To assess the effectiveness of the Air Quality Division in meeting its mission to regulate sources of air pollutants to minimize adverse impact on human health, the environment, and society.

Conclusion: We concluded that the Division's regulatory functions were generally effective in minimizing adverse impact on human health, the environment, and society. However, we noted reportable conditions relating to the development of quantified goals and objectives, monitoring of contractor, timely processing and district staff approval of new source review (NSR) permits, timeliness of enforcement activities, complaint investigations, and compliance inspections.

Noteworthy Accomplishments: In April 1995, the United States Environmental Protection Agency (U.S. EPA) designated the Detroit/Ann Arbor area as being in attainment with the ozone standard, making it the largest metropolitan area in the nation to achieve that status.

In the U.S. EPA Office of Inspector General audit report entitled "Region 5's Air Enforcement and Compliance Assistance Program," dated September 13, 1996, the Division was commended for its use of penalties, specifically those based on economic benefit that companies received by not complying with applicable air pollution laws and regulations, to deter companies from violations. During the last three fiscal years, judgments and settlements paid to the State for noted air violations have increased from $1,494,134 in fiscal year 1993-94, to $1,741,581 in fiscal year 1994-95, to $2,554,567 in fiscal year 1995-96. The other three Region 5 states reviewed by the U.S. EPA in its report did not usually assess the economic benefit component.

FINDING

1. Development of Quantified Goals and Objectives

The Division had not developed quantified goals and objectives to evaluate the extent to which its activities contribute to achieving its mission.

The Department of Environmental Quality (DEQ) has established an overall mission, and the Division has developed a number of goals, objectives, and activities which are used to evaluate whether its mission is being achieved. Also, the Division maintains a comprehensive emission inventory, along with a continual ambient air monitoring program, which provides the Division with general feedback on the achievement of its mission. However, although the Division had developed certain goals, objectives, and activities with quantified outputs* , it had not developed goals and objectives with quantified outcomes* . Therefore, the Division could not assess whether its mission had been met.

For example, one of the Division's goals for fiscal year 1995-96 was to "Identify and abate existing outdoor air pollution problems and design strategies for reducing or eliminating them." A Division objective for fiscal year 1995-96 was to "Monitor and inspect significant air pollution sources to detect violations of State and Federal air pollution laws. [and] Improve the degree of compliance with State and Federal air pollution laws." Division activities to fulfill this goal and objective in fiscal year 1995-96 centered around the inspection of a specific number of targeted facilities. However, because the Division had not established goals and objectives with quantified outcomes, it was unable to determine the extent to which its efforts (inspections) had achieved its mission. Quantified goals and objectives, including quantified outcomes, would aid the Division in determining if fewer inspections would result in the same reduction of emissions into the ambient air or if more inspections would be justified.

RECOMMENDATION

We recommend that the Division develop quantified goals and objectives to evaluate the extent to which its activities contribute to achieving its mission.

* *See glossary on page 36 for definition.*

AGENCY PRELIMINARY RESPONSE

DEQ agrees in part. DEQ believes that the Division is currently using state of the art measurements in setting its goals and objectives. However, DEQ also agrees to participate in a national effort to better define quantifiable outcomes.

Currently, the Division has numerous goals and objectives which are used to evaluate whether the Division and DEQ mission is achieved. Completion of these objectives is measured and evaluated annually. Furthermore, the Division conducts a comprehensive emission inventory and a comprehensive ambient air monitoring program, which provide very specific information about the quantity of air pollutants emitted into Michigan's atmosphere and the quality of Michigan's ambient air. Both the inventory and monitoring programs substantially measure the Division's success in meeting its mission to regulate sources of air pollutants to minimize adverse impact on human health, the environment and society. Measurement of fulfillment of the objectives, along with the emission inventory and ambient air monitoring program, do provide a means to assess whether the Division's mission has been met. During its annual evaluation of its goals and objectives, the Division will, to the best of its ability, set quantified outcomes which relate to its mission.

In response to the audit findings, DEQ also agrees to continue the development of better quantifiable outcomes as part of a national effort in its initial stage. DEQ has already begun development work in cooperation with the U.S. Environmental Protection Agency and the Environmental Council of the States (ECOS). Early on, it has been found to be extremely difficult to develop outcome measures for which data is available and to identify the impact of activities on outcomes. DEQ will continue to participate in this national effort.

FINDING

2. Monitoring of Contractor

The Division did not fully monitor the Wayne County Air Quality Management Division (AQMD) for compliance with contract provisions for the NSR permit program.

The Division has annually contracted with Wayne County AQMD to conduct site evaluation and engineering review for all NSR permits for sources in Wayne

County. The U.S. EPA has a grant agreement with Wayne County AQMD to conduct an air quality program which includes activity related to NSR permits. All NSR permits determined to be controversial in nature, subject to federal regulations, or dealing with toxic emissions were to be forwarded by Wayne County AQMD to the Division for review and approval prior to issuance of a State permit. All NSR permits that Wayne County AQMD concluded did not meet the criteria noted above were subject to the approval and issuance of a County permit without review and approval by the Division. Some of these County permits were only required under County ordinance and were not subject to State requirements.

Division management stated that it had concerns regarding the experience levels of the Wayne County AQMD staff, as well as inaccuracies and inconsistencies in permit conditions drafted by Wayne County AQMD staff. Division management noted these conditions during its review of site evaluations and engineering reviews submitted to the Division. However, the Division did not commit the resources necessary to monitor the NSR permits issued by Wayne County AQMD.

We noted a similar condition in our prior audit. In response, the Division stated that it would include an enforcement mechanism in future contracts with local agencies to ensure contract compliance.

For fiscal year 1996-97, the Division did not have a signed contractual agreement with Wayne County AQMD for the review of NSR permits. However, Wayne County AQMD continued to provide site evaluation and engineering review for Wayne County NSR permits until January 1997, when the Division assumed responsibility for these NSR permits as well. As of June 12, 1997, the Division and Wayne County AQMD were still negotiating a contractual agreement for fiscal year 1996-97.

RECOMMENDATION

WE AGAIN RECOMMEND THAT THE DIVISION FULLY MONITOR WAYNE COUNTY AQMD FOR COMPLIANCE WITH CONTRACT PROVISIONS FOR THE NSR PERMIT PROGRAM.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. The Wayne County AQMD conducts its program with funding and oversight from both the U.S. EPA and DEQ. As noted in the report, the Division does monitor the quality of the Wayne County staff's work for all the NSR permits forwarded to the Division for final review and action. While DEQ has monitored portions of Wayne County's performance under the terms of DEQ's contract, we agree that additional on-site auditing of the NSR permit elements of the program are appropriate. The Division has planned additional NSR monitoring for fiscal year 1997-98 which includes both ongoing oversight and on-site audits. The Division has requested the assistance of DEQ's internal audit staff for a portion of the on-site audits.

FINDING

3. Timeliness of Processing NSR Permits

The Division did not always approve or deny NSR permit applications within the time frame required by the *Michigan Administrative Code*.

Michigan Administrative Code R 336.1206 requires the Division to notify an applicant in writing of approval or denial of an application for an NSR permit within 60 days after receipt of an application and eight additional requirements specified in *Michigan Administrative Code* R 336.1203. However, this requirement has not changed since 1980 and does not include provisions for applications for NSR permits that require public hearings.

Michigan Administrative Code R 336.1205 (1)(b), effective July 26, 1995, requires certain draft NSR permits to be subjected to a public participation (hearing) process prior to the approval and issuance of an NSR permit. For NSR permit applications that require a public hearing, the Division has internally established a benchmark of 120 days to approve or deny the application.

Our review of 30 NSR permit applications issued during fiscal years 1994-95 and 1995-96 noted that 21 (70%) were processed within 60 days from the date that the NSR permit application containing the eight additional requirements specified in *Michigan Administrative Code* R 336.1203 was received. The average time to process the remaining 9 NSR permit applications was 137 days. Of the 9

applications not processed within 60 days, 2 were subject to a public hearing process.

We noted a similar condition in our prior audit. In response, the Division stated that it lacked sufficient resources to comply with the requirement and would propose rule changes to amend the 60-day requirement. However, at the time of our audit, no rule changes had been proposed. Since the prior audit, the Division has eliminated its backlog of NSR permit applications received but not acted upon (see Noteworthy Accomplishments on page 30).

RECOMMENDATIONS

WE AGAIN RECOMMEND THAT THE DIVISION APPROVE OR DENY NSR PERMIT APPLICATIONS WITHIN THE TIME FRAME REQUIRED BY THE *MICHIGAN ADMINISTRATIVE CODE*.

We also recommend that the Division revise the *Michigan Administrative Code* to establish reasonable time frames for NSR permit applications subject to a public hearing process.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. DEQ has made it a very high priority to process NSR permit applications in a timely manner and has improved its performance over the past years, as noted in this report. The Division has continued to make significant progress toward meeting the time frame for permit action in *Michigan Administrative Code* R 336.1206 (Rule 206). Information regarding the Division's progress is reported quarterly to DEQ management and the Michigan Jobs Commission for the Michigan On-Time Business Report. For the quarter ended June 30, 1997, 90% of all the permits acted on during that quarter were done within the 60-day time frame in Rule 206. This is a significant improvement from the 70% rate found by the audit. While most applications are processed in a very timely manner, the public comment, hearing process, and significant public interest in some applications have prevented the Division from meeting the 60-day time frame for the remaining applications. The Division commits to continued emphasis on timely actions on NSR permit applications.

Regarding the second recommendation, DEQ intends to propose modifications to Rule 206 to account for the extra time required to hold a public comment period as required by Section 5516 of Act 451. This will be accomplished by May 1, 1998.

FINDING

4. District Staff Approval of NSR Permits

The Division could improve the effectiveness of the NSR permit program by requiring district staff input prior to the issuance of NSR permits.

Since the prior audit, the Division had implemented formal procedures providing district staff the opportunity to have input in the development of NSR permits. The appropriate district staff were to be informed of the permit request and allotted a specified number of days to provide input if they so chose. However, because responses were not expected for all permits, the Division did not have assurance that district staff had addressed all permits.

We reviewed 35 NSR permits approved during fiscal years 1994-95 and 1995-96 and noted that 20 (57%) did not contain any documentation of district staff input prior to issuance.

RECOMMENDATION

We recommend that the Division improve the effectiveness of the NSR permit program by requiring district staff input prior to the issuance of NSR permits.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. In fact, the Division implemented changes after the end of the time period examined to effect this recommendation. On October 1, 1996, the Division issued a procedure entitled "Procedure to Assure Coordination with and Sign-Off by District Staff for All Permit to Install Applications." This procedure requires that district staff provide timely input to the Permit Section regarding all applications for permits to install.

FINDING

5. Timeliness of Enforcement Activities

The Division could improve the timeliness of its enforcement activities and its resolution of noted violations.

The Division's operating procedure for enforcement specifies that when a violation is noted, district office field staff will draft a letter of violation (LOV) which is to be sent to the source within 14 days of discovery of the violation. If the source is determined to be a significant violator or if the source does not provide satisfactory corrective action, the violation is referred to the Division's Compliance and Enforcement Section. If satisfactory corrective action is still not received, the violation may be referred to the U.S. EPA for further enforcement activities.

The Division maintains a case tracking data base in which all LOV's are input and their status is tracked. Staff provide quarterly updates to Division management as to the status and expected follow-up on their enforcement cases. The Division is required to report all significant violations to the U.S. EPA. In addition, the Division has monthly conference calls with the U.S. EPA to report on progress toward a corrective action program for federally significant violations, as well as to share information and discuss strategy.

We reviewed 11 of 85 cases referred to the Division's Compliance and Enforcement Section, 6 of which were closed and 5 of which remained open during our audit period. The average time from the date a violation was determined to have occurred until the date the corrective action was completed (in many cases by a signed consent order) for these cases was 525 days, ranging from 201 days to 1,675 days. Our review of case files disclosed that extended periods of time would pass with little documentation to determine progress made or causes for delays.

We noted extended delays in some cases while permit conditions were being drafted and negotiated. In most cases, the permit conditions were required to be developed before corrective action programs could be completed. However, permit reviews related to enforcement activities were not prioritized any higher than other permit reviews.

We also noted instances in which Division staff had established deadlines for their actions or for responses from the company in violation that were not followed up in a timely manner. For example, in one case, a company entered into a consent order for previous violations requiring certain tests to be completed and the results submitted to the Division within 60 days. The Division did not take further action until more than 90 days after the test results were due. When the test results were finally received, analysis by Division staff found that the testing was incomplete and the results were unacceptable.

There are a number of other factors that contribute to delays in enforcement activities and violation resolution that the Division has limited control over or influence on. The U.S. EPA Office of Inspector General audit report entitled "Region 5's Air Enforcement and Compliance Assistance Program," dated September 13, 1996, noted:

> Legal involvement, the need to obtain and verify evidence, a lengthy resolution process, and industry officials' delay tactics, can all result in untimely enforcement actions. Delays allow companies to continue polluting the air. . . . Such delays prevented states from meeting the EPA's requirements for timeliness and reduced the effectiveness of the enforcement actions.

RECOMMENDATION

We recommend that the Division improve the timeliness of its enforcement activities and its resolution of noted violations.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. DEQ supports efforts to improve timeliness of enforcement activities and violation resolution. While the report cites some cases where resolution did not appear to be timely, the Division directs its available resources first and foremost to resolving those enforcement cases where there are ongoing threats to the air resources.

DEQ believes that the Division has in place a good system to assess whether violations should be escalated to enforcement, a clear statement of which violations are significant, clear expectations with staff that all violations should be corrected, a process to frequently review progress to resolve violations, and a

mechanism to ensure that all significant violations are addressed through a legally enforceable program requiring full and expeditious compliance and an appropriate penalty.

Even so, the Division commits to consider and implement further actions by June 1, 1998 to minimize delays to effect more timely enforcement actions and resolution of violations for all enforcement cases.

FINDING

6. Complaint Investigations

The Division could improve the effectiveness of its complaint investigation resolution process.

The Division's operating procedures for complaint investigations identify complaints as an important source of information on air pollution problems that might otherwise go undetected. The procedures further state that complaint investigations which are handled in a competent, objective, and professional manner gain the investigators and the agency the public's respect, which is vital to the everyday operation of both field operation staff and the Division.

During our visits to 3 of the Division's 9 district offices, we reviewed 57 of 824 individual complaints. During our review, we noted:

a. The Division did not always document the disposition of complaints. The Division's operating procedures for complaint investigations specify that follow-up of all complaints should be documented by a written record identifying the disposition of the complaint.

We noted that 10 of the 57 individual complaints adequately documented the facts about the complainant's concerns but did not document the disposition of the complaint, including conclusions reached by the inspector as to whether an air pollution problem had been observed or whether additional follow-up was warranted. We also noted that 3 of the 57 individual complaints documented actions to be taken by the district office inspectors or the facilities

themselves to resolve the complaint, but we found no documentation to support that these required actions ever occurred.

Without documented resolutions for each complaint received, the Division cannot assure itself or anyone else that all complaints were properly investigated and resolved.

b. The Division did not always resolve complaints in a timely manner.

The Division's operating procedures for complaint investigations do not specify a time period for the resolution of public complaints. However, Division management indicated that 3 months was a reasonable time period for the resolution of complaints.

We noted that 4 of the 57 individual complaints were not resolved within three months. These complaints took between 6 and 19 months (average of 13 months) to resolve. We also noted that 4 of the 57 individual complaints were documented as being resolved, but the resolution date for these complaints was not documented in the company file or in the Michigan Compliance Database System (MCDS). Therefore, we could not determine whether these complaints were resolved in a timely manner.

Timely resolution of complaints should reduce the impact of air pollution problems on the public's health and the environment, as well as help gain the agency the respect of the general public for timely actions.

c. The Division did not require supervisory review of resolved complaints.

The Division's operating procedures for complaint investigations do not require that completed complaint investigations be subject to supervisory review and approval. The complaint log, used by staff to document public complaints, is a computerized system which allows for a hard copy of each public complaint to be printed. The printed complaint log is to be signed and dated by the preparer and placed in the appropriate company file for documentation. The printed complaint log also contains a section for the supervisor's initials to document review and approval.

We noted that the complaint log had not been initialed to document supervisory approval for 14 of the 57 individual complaints. We also noted that 4 of the 57 individual complaints were not documented in the company file by a complaint log form and were, therefore, not subject to supervisory review.

The Division informed us that supervisory review of completed complaint investigations was to be performed as time permitted and that the printed complaint log allowed for documentation of supervisory review when completed. Supervisory review of completed complaint investigations would help ensure that public complaints were properly documented and resolved in a consistent manner among staff.

d. The Division did not always inform complainants of the results of its complaint investigations when requested.

The Division's operating procedures for complaint investigations specify that the complainants shall be asked whether they wish to receive a response detailing how their complaints were resolved. The complainants' requests for a response is to be noted on the complaint log.

We noted that 17 of the 57 individual complaint logs documented the complainants' requests to receive a response detailing how their complaints were resolved. We noted that 8 of the 17 complainants who requested responses had not been provided a response detailing how their complaints were resolved.

The failure to inform complainants as to how their complaints were resolved may diminish the public's respect, which the Division has deemed vital to everyday operation.

RECOMMENDATIONS

We recommend that the Division improve the effectiveness of its complaint investigation resolution process by:

(a) Documenting the disposition of complaints.

(b) Resolving complaints in a timely manner.

(c) Requiring supervisory review of resolved complaints.

(d) Informing complainants of the results of its complaint investigations when requested.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. The Division agrees that the effectiveness of the compliant resolution process can be improved in the areas noted in the report. On January 16, 1997, the Division directed the district supervisors to better utilize the current computerized compliant logging and tracking system to better ensure that all of the compliant follow-ups and resolutions are completed and documented according to the Division's July 10, 1996 Compliant Investigation Procedures document. Additionally, the district supervisors have been directed to conduct at least one midyear review to ensure that procedures are being implemented. Finally, DEQ has submitted a program revision request for fiscal year 1998-99 to augment its ability to respond to complaints in all program areas.

FINDING

7. Compliance Inspections

The Division could improve the effectiveness of its compliance inspection process.

The Division receives a portion of its annual appropriation from a grant agreement with the U.S. EPA. A condition of this grant agreement is to conduct periodic inspections to ensure that sources of air pollution comply with both general standards defined in State and federal laws and specific conditions detailed in the source's permit. The Division's operating procedure for compliance activities and

reporting requires that, upon completion of an inspection, an activity report shall be drafted by district staff to document the results of the inspection, including any potential or confirmed violations identified during the inspection. The activity report is to be signed and dated by the district staff completing the inspection, as well as signed by the district supervisor upon review.

During our visits to 3 of the Division's 9 district offices, we reviewed 30 of 238 inspections. During our review, we noted:

a. The Division did not always document the results of compliance inspections. We noted that 2 (7%) of the 30 inspections were not supported by an activity report to document the results of the inspection. These two inspections had been reported to the U.S. EPA as having been completed.

   Without documentation of the inspection, the Division could not assure us that an inspection was in fact completed. Failure to complete inspections as reported to the U.S. EPA could put the Division at risk of losing federal funding.

b. Completed inspection activity reports were not always subject to review by the district supervisor. We noted that 3 (10%) of the 30 inspection activity reports were not located in the facility files but were documented in MCDS. Consequently, these three activity reports were not subject to review by the district supervisor.

   The district supervisor's review is an important internal control feature to verify that the activity reports are adequately documented, as well as to ensure that district staff are performing inspections consistently.

RECOMMENDATIONS

We recommend that the Division improve the effectiveness of its compliance inspection process by:

(a) Documenting the results of compliance inspections.

(b) Submitting all completed inspection activity reports to the district supervisor for review.

AGENCY PRELIMINARY RESPONSE

DEQ agrees. The Division believes that the compliance inspection process can be improved by having all inspection activity reports completed and then, reviewed and initialed by the district supervisor or lead worker who is responsible for the technical supervision of the assigned inspection staff. This has become part of the Division's procedures effective October 1, 1997.

EFFICIENCY OF PERMITTING, AIR QUALITY MONITORING, AND ENFORCEMENT PROCESSES

COMMENT

Audit Objective: To assess the efficiency of the Division's permitting, air quality monitoring, and enforcement processes.

Conclusion: We concluded that the Division's permitting, air quality monitoring, and enforcement processes were generally efficient.

Noteworthy Accomplishments: The Division eliminated its backlog of NSR permit applications that were received but not acted upon, which had peaked at nearly 900 in April 1993.

SUPPLEMENTAL INFORMATION

Description of the Six Principal Pollutants

CARBON MONOXIDE (CO)

Nature and Sources of the Pollutant: Carbon monoxide is a colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely. It is a byproduct of highway vehicle exhaust, which contributes about 60 percent of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

Health and Environmental Effects: Carbon monoxide enters the bloodstream and reduces oxygen delivery to the body's organs and tissues. The health threat from exposure to CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected, but only at higher levels of exposure. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, and difficulty in performing complex tasks. EPA's health-based national air quality standard for CO is 9 parts per million (ppm) measured as an annual second-maximum 8-hour average concentration.

LEAD (Pb)

Nature and Sources of the Pollutant: Smelters and battery plants are the major sources of lead in the air. The highest concentrations of lead are found in the vicinity of nonferrous smelters and other stationary sources of lead emissions.

Health and Environmental Effects: Exposure to lead mainly occurs through inhalation of air and ingestion of lead in food, paint, water, soil, or dust. Lead accumulates in the body in blood, bone, and soft tissue. Because it is not readily excreted, lead can also affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause anemia, kidney disease, reproductive disorders, and neurological impairments such as seizures, mental retardation, and/or behavioral disorders. Even at low doses, lead exposure is associated with changes in

fundamental enzymatic, energy transfer, and other processes in the body. Fetuses and children are especially susceptible to low doses of lead, often suffering central nervous system damage or slowed growth. Recent studies show that lead may be a factor in high blood pressure and subsequent heart disease in middle-aged white males. Lead may also contribute to osteoporosis in post-menopausal women. EPA's health-based national air quality standard for lead is 1.5 micrograms per cubic meter ($\mu g/m^3$) measured as an annual maximum quarterly average concentration.

NITROGEN DIOXIDE (NO_2)

Nature and Sources of the Pollutant: Nitrogen dioxide belongs to a family of highly reactive gases called nitrogen oxides (NO_x). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A suffocating, brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates. It also plays a major role in the atmospheric reactions that produce ground-level ozone (or smog).

Health and Environmental Effects: Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections such as influenza. The effects of short-term exposure are still unclear, but continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidence of acute respiratory illness in children. EPA's health-based national air quality standard for NO_2 is 0.053 ppm (measured as an annual arithmetic mean concentration). Nitrogen oxides contribute to ozone formation and can have adverse effects on both terrestrial and aquatic ecosystems. Nitrogen oxides in the air can significantly contribute to a number of environmental effects such as acid rain and eutrophication in coastal waters like the Chesapeake Bay. Eutrophication occurs when a body of water suffers an increase in nutrients that leads to a reduction in the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

OZONE(O_3)

Nature and Sources of the Pollutant: Ground-level ozone (the primary constituent of smog) is the most complex, difficult to control, and pervasive of the six principal air pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on NO_x and volatile organic compounds

(VOC) in the air. There are thousands of types of sources of these gases. Some of the common sources include gasoline vapors, chemical solvents, combustion products of fuels, and consumer products. Emissions of NO_x and VOC from motor vehicles and stationary sources can be carried hundreds of miles from their origins and result in high ozone concentrations over very large regions.

Health and Environmental Effects: Scientific evidence indicates that ground-level ozone not only affects people with impaired respiratory systems (such as asthmatics), but healthy adults and children. Exposure to ozone for 6 to 7 hours, even at relatively low concentrations, significantly reduces lung function and induces respiratory inflammation in normal, healthy people during periods of moderate exercise. It can be accompanied by symptoms such as chest pain, coughing, nausea, and pulmonary congestion. Recent studies provide evidence of an association between elevated ozone levels and increases in hospital admissions for respiratory problems in several U.S. cities. Results from animal studies indicate that repeated exposure to high levels of ozone for several months or more can produce permanent structural damage in the lungs. EPA's health-based national air quality standard for ozone is currently set at 0.12 ppm (measured as the second daily 1-hour maximum concentration). Ozone is responsible for approximately 1 to 2 billion dollars of agricultural crop yield loss in the U.S. each year. Ozone also damages forest ecosystems in California and the eastern U.S. New scientific studies indicate that ozone causes adverse health and environmental effects at lower concentrations and longer periods of exposure than the current standards. As a result, EPA is reviewing whether revisions to the current ozone National Ambient Air Quality Standard (NAAQS) are warranted.

PARTICULATE MATTER (PM-10)

Nature and Sources of the Pollutant: Particulate matter is the term for solid or liquid particles found in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Because particles originate from a variety of mobile and stationary sources (diesel trucks, woodstoves, power plants, etc.), their chemical and physical compositions vary widely. Particulate matter can be directly emitted or can be formed in the atmosphere when gaseous pollutants such as sulfur dioxide (SO_2) and NO_x react to form fine particles.

Health and Environmental Effects: In 1987, EPA replaced the earlier Total Suspended Particulate (TSP) air quality standard with a PM-10 standard. The new standard focuses on smaller particles that are likely responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract. The PM-10 standard includes particles with a diameter of 10 micrometers or less (0.0004 inches or one-seventh the width of a human hair). EPA's health-based national air quality standard for PM-10 is 50 $\mu g/m^3$ (measured as an annual mean) and 150 $\mu g/m^3$ (measured as a daily concentration). Major concerns for human health from exposure to PM-10 include: effects on breathing and respiratory systems, damage to lung tissue, cancer, and premature death. The elderly, children, and people with chronic lung disease, influenza, or asthma, are especially sensitive to the effects of particulate matter. Acidic PM-10 can also damage human-made materials and is a major cause of reduced visibility in many parts of the U.S. New scientific studies suggest that fine particles (smaller than 2.5 micrometers in diameter) may cause serious adverse health effects. As a result, EPA is considering setting a new standard for PM-2.5. In addition, EPA is reviewing whether revisions to the current PM-10 standards are warranted.

SULFUR DIOXIDE (SO_2)

Nature and Sources of the Pollutant: Sulfur dioxide belongs to the family of gases called sulfur oxides (SO_x). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes.

Health and Environmental Effects: The major health concerns associated with exposure to high concentrations of SO_2 include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Children, the elderly, and people with asthma, cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most susceptible to adverse health effects associated with exposure to SO_2. EPA's health-based national air quality standard for SO_2 is 0.03 ppm (measured on an annual arithmetic mean concentration) and 0.14 ppm (measured over 24 hours). SO_2 is a precursor to sulfates, which are associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and adverse health effects.

Source: The United States Environmental Protection Agency *Brochure on National Air Quality: Status and Trends* (document number EPA-454/F-96-008) dated October 1996.

Glossary of Acronyms and Terms

ambient air	That part of the atmosphere outside of buildings to which the general public has access.
attainment	A designation given an area of the State by the U.S. EPA in accordance with the federal Clean Air Act as having met the relevant National Ambient Air Quality Standard for a given criteria (principal) pollutant.
CAAA'S	Clean Air Act Amendments.
CCCP	Clean Corporate Citizen Program.
DEQ	Department of Environmental Quality.
DNR	Department of Natural Resources.
economic benefit	Economic advantages gained by violators through delayed or avoided costs.
ECOS	Environmental Council of the States.
effectiveness	Program success in achieving mission and goals.
efficiency	Achieving the most outputs and outcomes practical for the amount of resources applied or minimizing the amount of resources required to attain a certain level of outputs or outcomes.

escalated enforcement	Additional or heightened enforcement activities taken against a company known to have committed a violation where district office enforcement activities have failed to produce an acceptable resolution or when noted violations were significant enough to necessitate a formal resolution (i.e., formal consent order).
goals	The agency's intended outcomes or impacts for a program to accomplish its mission.
HAP	hazardous air pollutant.
LOV	letter of violation.
major source	A source having the potential to emit 10 tons or more per year of a single HAP, or 25 tons or more per year of a combination of HAP's, or 100 tons or more per year of any other pollutant regulated under the Clean Air Act.
MAPCC	Michigan Air Pollution Control Commission.
MASN	Michigan Air Sampling Network.
MCDS	Michigan Compliance Database System.
mission	The agency's main purpose or the reason the agency was established.
NSR	new source review.

objectives	Specific outputs a program seeks to perform and/or inputs a program seeks to apply in its efforts to achieve its goals.
outcomes	The actual impacts of the program. Outcomes should positively impact the purpose for which the program was established.
outputs	The products or services produced by the program. The program assumes that producing its outputs will result in favorable program outcomes.
performance audit	An economy and efficiency audit or a program audit that is designed to provide an independent assessment of the performance of a governmental entity, program, activity, or function to improve public accountability and to facilitate decision making by parties responsible for overseeing or initiating corrective action.
reportable condition	A matter coming to the auditor's attention that, in his/her judgment, should be communicated because it represents either an opportunity for improvement or a significant deficiency in management's ability to operate a program in an effective and efficient manner.
ROP	renewable operating permit.
significant violation	A violation by a source of sufficient magnitude and/or duration to be a regulatory priority.

source	All of the processes and process equipment under common control that are located within a contiguous area, or a smaller group of processes and process equipment as requested by the owner or operator of the source, if in accordance with the Clean Air Act.
stack	A flue, conduit, or duct arranged to conduct a gas stream to the outer air.
U.S. EPA	United States Environmental Protection Agency.
Wayne County AQMD	Wayne County Air Quality Management Division.