U.S. Department of Labor Inspector General
Washington, DC 20210

FEB. 20, 1997

MEMORANDUM FOR: J. DAVITT McATEER
Assistant Secretary for Mine Safety and Health

FROM CHARLES C. MASTEN
Inspector General

SUBJECT: Review of the Mine Safety and Health Administration's Pittsburgh Safety and Health
Technology center
Report No. 09—OEI-97-MSHA

This memorandum report presents the results of a review of selected operations of the Mine Safety and Health Administration (MSHA)'s Pittsburgh Safety and Health Technology Center conducted by the Office of Inspector General, Office of Evaluations and Inspections. Our review, initiated in response to a Congressional inquiry, did not confirm the concerns cited with respect to the Technology Center, specifically: (1) that the soil testing laboratory is inefficient or unnecessary; (2) that the Roof Control Division duplicates the responsibilities of the Mine Waste and Geotechnical Engineering Division; or (3) that the Roof Control Division provides mine design support to small operators. Rather, we concluded that these complaints are based upon inaccurate or incomplete information, and, therefore lack merit. Since no other issues regarding the Technology Center's operations came to our attention during the course of our review, this memorandum is provided for informational purposes and does not require a response.

I. Background

The Assistant Secretary for Mine Safety and Health requested that the Office of Inspector General review the concerns raised in correspondence, dated August 2, 1996, from Congressman Daniel Schaefer. This report presents the results of the second in a series of reviews planned to address the issues forwarded by the Congressman. Our review was conducted in accordance with the quality Standards for Inspections published by the President's Council on Integrity and Efficiency and included analysis of the Center facilities, technical support logs, files, internal

evaluations, and interviews with selected MSHA personnel. The issues and allegations pertaining to the soil testing laboratory have been previously reviewed by MSHA, and the agency provided the results of these internal reviews to OIG.

MSHA's soil and testing laboratory provides an independent capability for testing and verifying soil properties (including density) associated with refuse and impoundments. The laboratory was established following the Buffalo Creek mining dam disaster. Due to budgetary constraints, the laboratory was equipped on an incremental basis whereby MSHA purchased new equipment over a 19 year period or obtained surplus equipment.

The Roof Control Division handles safety related issues regarding roof and ground control/support for underground mines and mining equipment. Roof Control Division engineers spend a significant amount of time conducting field investigations at underground mines where a roof collapse or related accident has occurred or a serious potential safety problem has been identified. The Roof control Division also conducts laboratory testing for MSHA field offices regarding the structural suitability of roof support materials and reviews proposals and prototypes from manufacturers regarding roof support equipment. When requested, the Roof Control Division's employees will assist MSHA District Managers with technical questions involving roof control safety plans submitted to the District Managers by mine operators. Other technical support includes topographic remote sensing, using digital satellite imaging, to assist operators in identifying structural mine deficiencies and training mine safety personnel, including MSHA roof control inspectors. Roof Control Division engineers hold degrees in mining, civil or mechanical engineering or geology.

The Mine Waste and Geotechnical Engineering (MWGE) Division employs civil engineers who deal with above-ground safety issues associated with surface highwall stability, ground stability and waste removal, particularly impoundments and hydrology issues. The MWGE Division's engineers perform technical reviews of engineering plans for refuse and waste impoundments routinely submitted to them by MSHA District Managers. Operators are required to submit plans for all new mine impoundments, as well as requests for expansion of existing impoundments. An integral part of any refuse pile or impoundment plan is the determination of the structural properties of the construction materials which requires sampling, field testing and laboratory testing.

II. Review Results

1. Soil Testing Laboratory

Our objectives in evaluating the soil testing program were to determine the usage of the laboratory and related costs for the past five years and the potential availability of more cost effective alternatives for conducting the tests in the future. The soil laboratory, which supports significant MSHA enforcement goals, conducts a more extensive testing program than indicated in the Congressional inquiry which served as a basis for our review. In addition, the cost of the space, the staffing level and the estimated value of the laboratory equipment are immaterial and were substantially overstated in the correspondence forwarded to us, while the expense of contracting the soil tests to commercial laboratories would be higher than cited. We, therefore, concluded that the soil testing laboratory is a cost effective operation critical to MSHA's mission and we did not identify opportunities for future efficiencies in this program.

The importance of the soil testing laboratory to MSHA's mission is supported by both the agency's internal reviews and our evaluation. By using its own soil testing laboratory, MSHA avoids the potential conflicts of interest which could arise from contracting with a commercial laboratory that may also conduct soil tests for mine operators under MSHA review. Immediate access to laboratory equipment permits MSHA personnel to test soil materials without delay and address structural safety deficiencies promptly. The laboratory may also serve a deterrent purpose since mine operators are aware that MSHA enforcement personnel can readily and independently measure indicators of the structural integrity of their refuse piles and impoundments.

Our review of MSHA records did not confirm the Congressional constituent's contention that only one or two sample tests have been conducted per year, over the last five years. Analysis of the documentation from the MWGE Division's files regarding technical assistance requests for soil testing activity disclosed that formal technical assistance responses were prepared and the results reported to MSHA inspectors or other agency officials 13 times over the last five years. It should be noted, however, that this figure does not represent the total number of tests

conducted on the multiple samples taken from each site. For a typical technical assistance effort, there could be as many as 35 samples used in 6 different tests, equating to approximately 455 sample tests over the same five year period, or approximately 91 sample tests per year. Tests of soil samples collected in conjunction with the independent field research of MWGE Division engineers are also conducted in the laboratory to compare, confirm or evaluate data, from the engineers' field observations and these tests are not included in the above totals of technical assistance requests. In addition, the laboratory is used to construct scale models for instructional demonstrations by MWGE Division staff during accident prevention forums and other safety training activities sponsored by MSHA.

Analysis of records and interviews with MSHA officials regarding laboratory equipment and rental of space did not support the complainant's position that the soil testing laboratory is valued at $500,000 to $600,000. Our review indicates that MSHA expenditures for the equipment totaled $130,751, with an additional $20,575 in equipment obtained by MSHA free of charge via government surplus. It should be noted that the current value of the equipment would be significantly lower if depreciation were applied since most of the equipment is between 10 and 20 years old. The annual rental expense for the soil laboratory space, including utilities, maintenance and janitorial services, equals approximately $17,500, half the total charge for both the rock and soil testing laboratories.

While the correspondence forwarded by the Congressman states that comparable private soil testing laboratories would charge about $1,000 per test, our review determined that the cost for the series of tests conducted on samples for a typical technical assistance effort totals as much as $3,680. Our calculation was based on estimates of the commercial cost for laboratory testing work on mine waste and soil samples developed by MWGE Division staff in May 1995. The costs reflected the average costs from two geotechnical testing laboratories in the Pittsburgh area. While the nature of required testing varies depending on the type of problem being investigated or evaluated, a technical assistance effort for a site typically consists of multiple laboratory tests. It should also be noted that the MSHA laboratory has some larger equipment not typically found in local commercial laboratories, such as the instrument used for a Triaxial Compression test. Triaxial

tests on the larger samples found in coarse refuse would be considered special tests for a local commercial laboratory and would, therefore, significantly increase the costs for that test series.

While the complainant's correspondence referenced multiple technicians employed by the soil testing laboratory, our review determined that, with the decreasing staffing levels at the Technology Center, no technicians are currently assigned on a full-time basis to exclusively conduct soil sample testing. The technician who had been responsible for all soil laboratory and field work as well as maintaining the equipment retired on March 31, 1995. Since his retirement, junior engineers generally perform the soil testing with assistance, as needed, from the rock laboratory technician. The rock laboratory technician is also called upon to service the laboratory equipment when necessary, rather than utilizing the services of an outside company.

In order to determine the potential f or increasing the usage of the soil testing laboratory and generating revenue from this MSHA asset, we contacted officials of other Federal agencies with soil testing needs in the Pittsburgh area. However, none of the agencies expressed an interest in conducting tests at the Technology Center since their staffs lack the training to operate MSHA's equipment and/or their requirements for soil tests are rare.

2. Functional Overlap Between the Roof Control Division and the MWGE Division

We thoroughly examined the workload and responsibilities of the Roof Control and MWGE Divisions to determine whether functional overlap or duplication of activities exists, as noted in the Congressional correspondence. We concluded that the Roof Control Division and the MWGE Division are distinct organizations whose responsibilities and workloads are clearly delineated.

The geologist and mining, civil and mechanical engineers of the Roof Control Division primarily address safety related issues regarding roof and ground support for underground mines, including ground support, ground control, pillar design, remote sensing, and prototype testing. The MWGE Division employs civil engineers who are responsible for above-ground safety related issues associated with surface

highwall stability, ground stability, and waste removal, particularly impoundments and hydrology issues. Similar to employees of other divisions at the Pittsburgh Safety and Health Technology Center, staff of the Roof Control and the MWGE Divisions work together when appropriate, sharing resources and expertise. For example, if underground mining operations occur below a body of water, the Roof Control Division engineers will consult with the MWGE Division's hydrology experts. The MWGE Division, in turn, may utilize the services of the Roof Control Division's geologist on above ground structural issues, such as those associated with highwall stability. However, review of logs maintained by the Roof Control Division and interviews with engineers from both divisions indicate that such cooperation does not blur the fundamental distinctions or unique responsibilities of the two units.

3. Small Mine Design Technical Support

Our objectives in evaluating the allegation that improper, and possibly illegal, mine design support is being provided to small mines by the Roof Control Division were to determine whether the division offers free technical support to operators for mine designs, and if so, the nature and extent of such technical support. In addition, MSHA's responsibilities to provide technical support to operators were examined, as well as any specific statutory or regulatory prohibitions regarding technical assistance. We concluded that the Roof Control Division has not provided technical support to any operator in a manner inconsistent with applicable law, regulation, or MSHA policy.

Both the Federal Mine Safety and Health Act of 1977 and MSHA regulations require that all operators be provided with safety-related technical support whenever possible, free of charge. Consequently, operators may formally apply for technical support in such areas as roof control, prototype testing, etc. No formal prohibitions or restrictions regarding the provision of safety related technical support to operators were identified.

Operators of underground mines, regardless of size, are required to submit roof control safety plans to MSHA District offices for approval before they start mining operations and every six months thereafter. An MSHA District office may request the Roof Control Division to

review an operator's roof control plan before approval. During the course of a field investigation, the Roof Control Division may also review an operator's roof control safety plan and suggest improvements or modifications to that plan. Field investigations may be conducted on a mine of any size and are normally requested by MSHA District offices, with a small number requested by MSHA headquarters, union officials, or mine operators themselves. In addition, the Roof Control Division will provide, upon request, satellite remote sensing data to any operator for use in designing a roof control safety plan. However, in all of the above referenced situations where the Roof Control Division is involved with an operator's safety plan, the design of the original safety plan is the responsibility of the operator. We. found no evidence to indicate that technical support is provided to any operators to assist in their general, nonsafety related, mining activities.

In summary, our review determined that the concerns raised in the correspondence forwarded by Congressman Schaefer regarding selected operations of the Pittsburgh Safety and Health Technology Center were without foundation and no other conditions at the Center requiring corrective action came to our attention. This report, therefore, is considered closed upon issuance and no response is required.

We appreciate the cooperation received from MSHA officials during the course of this review. If you have any questions concerning this report, please contact Veronica M. Campbell at (202) 219-8446, ext. 143.