



preempts the cited general electrical standard, section 1926.407(b). Accordingly, we vacate the citation.

The cited tunnel, a part of the Southwest Interceptor sewage project in Cleveland, Ohio, was dug in Cleveland shale, a geological formation known to contain the combustible gas methane. The Secretary alleges that K M & M, A Joint Venture (“K M & M”) violated section 1926.407(b) because “[w]iring methods of 120 volt lighting equipment and electrical equipment . . . in hazardous (classified) location [of the tunnel] were not approved as intrinsically safe.” The Secretary alleges that K M & M’s tunneling operation required electrical equipment approved for Class I, Division 2 locations as defined at section 1926.449 and classified the tunnel construction as a “potentially gassy” operation, as defined in section 1926.800. K M & M argues that the specific requirements of section 1926.800 should prevail over the general language of section 1926.407 and that it was in compliance with the requirements of section 1926.800.

Administrative Law Judge James D. Burroughs found that section 1926.800(s)<sup>2</sup> makes section 1926.407 applicable to tunneling operations. He noted that for a Class I, Division 2 location, the Secretary must determine the quantity of gas involved and the amount of ventilation in the worksite in order to prove that the quantity of gas is sufficient to produce a “flammable or combustible concentration,” as required by section 1926.407. *Continental Oil Co.*, 11 BNA OSHC 2114, 1984 CCH OSHD ¶ 26,993 (No. 79-570-E, 1984). The judge found that sections 1926.407 and 1926.449 do not set forth any criteria for making this determination, but that section 1926.800 “does provide guidelines in determining a hazardous classification applicable to a tunnel.” The judge also found that “[s]ince section 1926.800 specifically applies to the construction of tunnels, its language in regard to hazardous classification takes precedence over the general provisions of sections 1926.407(b) and 1926.449.” The judge vacated the citation because the Secretary failed to prove that the working area was “potentially gassy.”

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<sup>2</sup> Section 1926.800(s), which is entitled “[e]lectrical safety,” provides as follows: “This paragraph applies in addition to the general requirements for electrical safety which are found in Subpart K of this part.” Sections 1926.800(s)(1) through (3) discuss the requirements for electric power lines, lighting circuits, and oil-filled transformers.

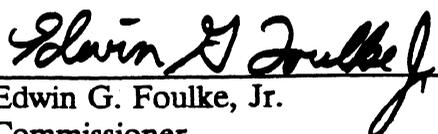
Although we also vacate the citation, we do so on the basis of our holding in *McNally* that the specific standard, section 1926.800, preempts the application of the general standard, section 1926.407(b) for electrical equipment in “potentially gassy” underground operations. We reached this conclusion not only because section 1926.800 addresses the same hazard as section 1926.407 but also because these two standards set forth conflicting requirements rather than complementary ones. If an employer simultaneously complied with the two standards at issue here, it would not only be taking different steps to abate the same hazard, but section 1926.407 would effectively preempt section 1926.800.

The judge’s finding that section 1926.800(s) permits the application of section 1926.407 might be plausible if the provision could be read in isolation, but it is not tenable when read together with the remainder of section 1926.800, which, as discussed in *McNally*, speaks directly to electrical ignition hazards in tunnels. Section 1926.800(s) is consistent with the proposition that a provision in section 1926.800 that specifically addresses a hazard preempts a general provision in Subpart K. Indeed, within the context of the language of section 1926.800 in effect at the time these citations were issued, we find it difficult to read section 1926.800(s) as more than a saving clause. We find no basis for the judge’s conclusion that a Class I, Division 2 location under sections 1926.407 and 1926.449 is defined by reference to section 1926.800.

Our holding would ordinarily require that we consider whether amendment of the citation to allege noncompliance with section 1926.800 would be appropriate. However, we conclude that it is unnecessary for us to make that determination here. The Secretary acknowledges that the tunnel construction was at most a “potentially gassy” operation, and there is no evidence in the record that K M & M failed to meet the provisions of section 1926.800 that address such operations.

**III. Order**

For the reasons given above, we vacate the Secretary's citation alleging a willful violation of 29 C.F.R. § 1926.407(b).

  
Edwin G. Foulke, Jr.  
Commissioner

  
Velma Montoya  
Commissioner

Dated: July 13, 1994



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SECRETARY OF LABOR,

Complainant,

v.

K M & M, A JOINT VENTURE,

Respondent.

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Docket No. 89-3403

**NOTICE OF COMMISSION DECISION**

The attached decision by the Occupational Safety and Health Review Commission was issued on July 13, 1994. **ANY PERSON ADVERSELY AFFECTED OR AGGRIEVED WHO WISHES TO OBTAIN REVIEW OF THIS DECISION MUST FILE A NOTICE OF APPEAL WITH THE APPROPRIATE FEDERAL COURT OF APPEALS WITHIN 60 DAYS OF THE DATE OF THIS DECISION.** See Section 11 of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 660.

FOR THE COMMISSION

July 13, 1994  
Date

Ray H. Darling, Jr.  
Executive Secretary

Docket No. 90-2337

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Secretary of Labor,  
Complainant,

v.

Docket No. 89-3403

K M & M, A Joint Venture,  
Respondent.

**NOTICE OF DOCKETING**

The Administrative Law Judge's Report in the above referenced case was docketed with the Commission on March 28, 1991. The decision of the Judge will become a final order of the Commission on April 2, 1991 unless a Commission member directs review of the decision on or before that date. **ANY PARTY DESIRING REVIEW OF THE JUDGE'S DECISION BY THE COMMISSION MUST FILE A PETITION FOR DISCRETIONARY REVIEW.** Any such petition should be received by the Executive Secretary on or before April 17, 1991 in order to permit sufficient time for its review. See Commission Rule 91, 29 C.F.R. § 2200.91.

All further pleadings or communications regarding this case shall be addressed to:

Executive Secretary  
Occupational Safety and Health  
Review Commission  
1825 K St., N.W., Room 401  
Washington, D. C. 20006-1246

Petitioning parties shall also mail a copy to:

Daniel J. Mick, Esq.  
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If a Direction for Review is issued by the Commission, then the Counsel for Regional Trial Litigation will represent the Department of Labor. Any party having questions about review rights may contact the Commission's Executive Secretary or call (202) 634-7950.

FOR THE COMMISSION

March 28, 1991  
Date

*Ray H. Darling, Jr.*  
Ray/H. Darling, Jr.  
Executive Secretary

Docket No. 89-3403

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SECRETARY OF LABOR, )  
 )  
Complainant, )  
 )  
v. ) OSHRC Docket No. 89-3403  
 )  
K M & M, A JOINT VENTURE, )  
 )  
Respondent. )

**APPEARANCES:**

Christopher J. Carney, Esquire, Office of the  
Solicitor, U. S. Department of Labor, Cleveland,  
Ohio, on behalf of complainant

William F. Snyder, Esquire, Cleveland, Ohio, on  
behalf of respondent

**DECISION AND ORDER**

Burroughs, Judge: K M & M, a joint venture formed by  
three corporations,<sup>1</sup> contests a willful citation, alleging a  
violation of § 1926.407(b), issued to it as a result of its  
work on an underground gravity based sewer project in the  
Cleveland, Ohio, area which is referred to as the Southwest

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The three corporations, the Kassouf Company, Murray Hill  
Construction Company, and Mole Construction Company, have all  
been active in the underground sewer construction business.  
The joint venture was formed to bid and work on portions of the  
Southwest Interceptor (Tr. 188).

Interceptor ("SWI"). The project extended approximately 10.8 miles through the southwestern portion of Cuyahoga County, Ohio.

Due to the magnitude of the project, the SWI was divided into seven contracts, each of which called for separate bids. K M & M was awarded Contract V and commenced work on its part of the project in February, 1989. The digging of a 100-foot deep shaft was completed on or about March 31, 1989. Once the shaft was completed, K M & M commenced to excavate an extension of a tunnel 11 feet in diameter for approximately 6,700 feet. This second phase of the work was commenced on July 11, 1989, and completed on November 7, 1989 (Ex. R-5; Tr. 12, 14).

The SWI is owned by the Northeast Ohio Regional Sewer District ("NEORS"). NEORS contracted with Woodward-Clyde Consultants, consulting engineers, to provide, among other things, subsurface information that would "aid contractors in the development of realistic bidding quantities" (Ex. C-1, Introduction). The report prepared by Woodward-Clyde Consultants ("W-C Report") states that the tunnel constructed under Contract V "will be constructed entirely in Cleveland Shale."

Compliance Officer R. Frank Coffelt visited the site on August 29, 1989, and September 20, 1989. On his first visit, he was accompanied by William Kremzar, his supervisor, and Frank Burg of the OSHA regional office in Chicago. On the second visit he was accompanied by Kremzar. At the time of the

first visit, K M & M had extended the tunnel 2,000 feet (Tr. 14).

On the first visit Kremzar, Coffelt and Burg inspected the tunnel (Tr. 14). They descended the 100-foot shaft in a man cage that was lowered by the boom of a crane. The tunnel was 11 feet in diameter and supported by steel and wood ribbing (Tr. 14, 15). The tunnel was being excavated by a boring machine ("TBM"). Approximately nine employees worked in the tunnel (Tr. 16). The front of the TBM contained a wheel, 11 feet in diameter, which had a number of carbide tipped blades or teeth. As the wheel was pressed against the rock face, it chipped away the rock and propelled it onto a conveyor belt. The conveyor belt transported the rock to the railroad cars behind the machine which, in turn, transported the material to the shaft opening. The material was removed from the shaft by the crane (Tr. 16, 225, 226). The teeth of the wheel created a lot of sparks as it struck the rock (Tr. 226).

A determination was made that the tunneling operation was being conducted in a Class I hazardous location that required the use of explosion-proof equipment.<sup>2</sup> The 120-volt lighting equipment, which extended the length of the tunnel at 8-foot to 10-foot intervals, was not approved for a Class I, explosion-

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Class I, explosion-proof wiring and equipment is designed so that it will not arc or spark. Unapproved electrical equipment is more likely to arc or spark, igniting any flammable gas that may be in the atmosphere (Tr. 30).

proof environment. A drill, chain saw and coffering hoist, utilized at various points within the tunnel, were also unapproved for a Class I, explosion-proof environment (Tr. 31-33).

The description of the alleged violation of § 1926.407(b) states that "[t]he tunnel was classified potentially gassy from the geotech study and history of the area, in that methane was detected in excess of 10% of LEL." K M & M submits that the tunnel in question was not a "potentially gassy" operation, as defined in § 1926.800(h)(1), and that it was not required to install explosion-proof fixtures and wiring. In addition, K M & M asserts that it did not need explosion-proof wiring and equipment because it adequately ventilated the tunnel, monitored for combustible gases and evacuated the tunnel when 10 percent of the LEL was encountered. It relies on its own monitoring results, all of which were taken with the ventilation running, for its contention that Contract V was not a potentially gassy operation as defined in 29 C.F.R. § 1926.800.

Subpart S of Part 1926 contains specific requirements for tunnels. Paragraph (s) of § 1926.800<sup>3</sup> makes it clear that

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Section 1926.800(s) states:

(s) Electrical safety. This paragraph applies in addition to the general requirements for electrical safety which are found in Subpart K of this part.

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Subpart K (Electrical) is applicable to tunnel operations. The cited standard, § 1926.407(b), provides:

(b) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location . . . .

The standard refers to hazardous locations which are explained in § 1926.407(a) as "locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present." Section 1926.407(a) assigns six designations to hazardous locations. These designations include Classes I, II and III, each of which include Divisions 1 and 2. The designations are defined in § 1926.449.

Class I, II and III locations cover different hazards. Class I covers flammable gases or vapors and is defined as follows (§ 1926.449):

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class I locations are divided into Division 1 and Division 2 locations, which are defined as follows (§ 1926.449):

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(1) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

(2) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(3) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(1) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(2) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(3) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

The Secretary contends that the tunnel should be classified as a Class I, Division 2 hazardous location. In support of this classification, it is pointed out that (1) the tunnel was excavated exclusively in Cleveland Shale, a known gas-producing geologic strata (Ex. R-1; Tr. 88), (2) that Keith Mast

expressed the opinion that flammable gases or vapors may be present in the area of construction in quantities sufficient to produce an explosive atmosphere, and (3) that the test bore gas measurements contained in the W-C Report and the shaft fire support Mast's opinion.

The Commission in Continental Oil Company, 84 OSAHRC 33/A2, 11 BNA OSHC 2114, 1984 CCH OSHD ¶ 26,993 (No. 79-570-E, 1984), made the following comments concerning a Class I, Division 2 location as defined at § 1910.399(a)(24)(ii):<sup>4</sup>

\* \* \* A Class I, Division 2 area is defined as an area in which a hazardous concentration of flammable gases and vapors is not normally present but can arise under certain circumstances, such as leakage from an enclosed system or failure in the ventilation. The definition does not establish any unbending rules. A great deal of discretion is left to the person determining where the electrical equipment is to be located. The standard specifically instructs that certain factors should be considered:

The quantity of flammable material that might escape in case of an accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

The Commission concluded that the Secretary had the following burden of proof in order to prove the violation:

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The wording of a Class I location is the same under § 1926.449 and § 1910.399(a)(24)(ii). The definition of Divisions 1 and 2 differs in one respect--§ 1910.399(a)(24) refers to "hazardous concentrations" of flammable gases or vapors, whereas § 1926.449 refers to ignitable concentrations.

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\* \* \* The Secretary must demonstrate that the conditions are such that the proximity of unapproved electrical equipment to a source of vapors presents the hazard of a fire or explosion. To do so, the Secretary must consider the factors specifically mentioned in the standard. Therefore, the Secretary must show that given the quantity of material involved, the amount of ventilation at the workplace, the area involved and the record of accidents, the placement of unapproved electrical equipment in relation to a potential source of hydrocarbon is contrary to sound engineering judgment.

At the time the citation was issued, the determination that the tunnel was a hazardous location was based on prior history, the W-C Report, and the results of the test borings provided in the W-C Report (Tr. 17). No effort was made to measure the gas in the tunnel or to review the daily logs of gas monitoring kept by K M & M (Tr. 58-59). The report was never discussed with anyone from Woodward-Clyde Consultants.

The Secretary points to the following evidence which she suggests amply supports the determination that the tunnel was a hazardous location which necessitated the applicability of § 1926.407(b):

(1) The tunnel bore was constructed entirely in Cleveland Shale (Ex. C-1; Tr. 14, 89).

(2) The W-C Report mentions on several occasions that Cleveland Shale is known to be a formation that produces combustible gas.

(3) Seven of the eight test borings made and included in the W-C Report measured gas concentrations ranging from 15% to 100% of LEL (Ex. C-1; Tr. 21).

(4) Testimony by Keith Mast that the area where the tunnel was being excavated was an area where flammable gases could be present in quantities sufficient to produce an explosive atmosphere (Tr. 123).

(5) The project had been inspected in February, 1989, during the shaft construction phase of Contract V (Tr. 42). The inspection was conducted subsequent to a fire in one of respondent's drop shafts (P-4, 42). The fire occurred even though the mechanical ventilation system was operating and the monitoring system was in place (Tr. 42, 216). The monitoring failed to detect the presence of gas (Tr. 216).

(6) The testimony of Thomas Richards that Cleveland Shale is widely recognized as a gas-producing shale (Tr. 89), and that the area encompassed under Contract V falls within the definition of "potentially gassy."

(7) The specifications set forth for the bidding on Contract V states that flashlights and "appropriate fixtures [lighting] shall be explosion proof" (Ex. C-3).

The W-C Report mentions on several occasions that the Cleveland Shale is known to be a formation which produces combustible gas (Ex. C-1). Paragraph 2.4 entitled "Natural Gas Conditions," states:

Many domestic gas wells in the Cleveland area have been terminated in the Cleveland Shale. Most of these wells have been abandoned as they were found to not produce gas continuously. The shale gas is not confined to any one horizon, but is found in the openings along joint and fracture planes. The gas found in the shale is generally under pressure not exceeding 100 psi.

Paragraph 4.1 refers to the fact the "rock formations are known to be gas producing." In the same paragraph and under the heading "Gas," the report further states:

Gas. Explosimeter measurements of relative gas concentrations were made in eight borings during and after drilling. Table A-3 (Appendix A) presents the results of the gas measurements. Gas was measured in seven of the borings with gas concentrations ranging from 15 percent to 100 percent of the Lower Explosive Limit (LEL). One hundred percent LEL is defined as the lowest concentration of a combustible gas at which ignition can occur. Extended gas measurements in observation wells within and adjacent to Contract 5 showed that the gas was of limited volume and generally vented within a few weeks.

In paragraph 5.1, the report states: "The Cleveland Shale is known to be a formation which produces combustible gas." While there are several references to gas, the report does not attempt to place any type of classification on the working conditions of the tunnel.

Keith Mast, a geotechnical engineer employed by Woodward-Clyde Consultants, was one of the authors of the report prepared by his firm (Tr. 112). Mast stated that there are pockets of gas in Cleveland Shale (Tr. 114, 121). It accumulates in the cracks, fissures, small pockets, and occasionally within floor space within the rock (Tr. 115. 122-123). He concedes that it is not possible to tell where the gas might accumulate (Tr. 123) but stated that gasses or vapors may be present in quantities sufficient to produce an explosive atmosphere (Tr. 123). His answer had reference to the bore holes made by his firm to measure for gas (Tr. 123). According

to Mast, the purpose of the W-C Report was not to determine whether the area was "gassy" or "potentially gassy" but to alert contractors that there was gas in the area through which the tunnel was to be excavated (Tr. 114, 115). Mast never had to make a determination as to how to classify the area, and he expressed no opinion on the issue at trial. While each party finds something to cite from his testimony, the advantage must go to K M & M since reliance was placed by the Secretary on the gas measurements for the eight test hole borings. Mast indicated that the gas measurements for the two- to four-inch bore holes could not be equated with a tunnel 11 feet in diameter.

K M & M disputes the "potentially gassy" classification and relies on a number of steps taken by it to discover and dissipate any gas encountered in the tunnel. It stresses the following points:

(1) New bore holes, 6 to 12 inches in diameter, were drilled ahead of the TBM. The bore holes served several purposes but were monitored for gas (Tr. 150).

(2) A multiple monitoring system was maintained to test the quality of the air in the tunnel. This included fixed monitors on the boring machine, hand-held monitors which were carried throughout the tunnel on a per shift basis, and surface monitors which took readings throughout the tunnel (Tr. 189-193). The recordings were maintained in a daily log (Ex. R-5).

(3) The daily logs maintained throughout the completion of Contract V reflected a zero reading for methane gas in the overwhelming number of instances. There was one reading of 11 percent LEL and one reading of 5 percent LEL during the entire project, including both the shaft and tunnel (Ex. R-5).

(4) The meters were set to give an alarm at 10 percent LEL and to shut off at 20 percent LEL (Tr. 193). K M & M had a standard practice of evacuating the tunnel whenever the ventilation system failed to operate for any reason or whenever they got a reading approaching 10 percent LEL (Tr. 189-195, 231). In one instance, the ventilation system was down for more than four hours and the methane level never reached 10 percent LEL (Tr. 231).

K M & M, like the Secretary, finds support for its position in the testimony of Keith Mast. He stated that the W-C Report was not intended and could not be relied upon to quantify the potential for encountering gas in Cleveland Shale, nor for determining that the location of Contract V was a "potentially gassy" area (Tr. 114-116). He made the further point that the methane readings in two- to four-inch bore holes does not indicate similar readings will be encountered in an 11-foot ventilated tunnel (Tr. 116, 118, 121, 123).

Thomas A. Richards, testifying as an expert on behalf of the Secretary, stated that SWI Contract V was excavated in a "potentially gassy" area (Tr. 90). This opinion was based on the fact that Cleveland Shale is widely recognized as a gas-

producing shale and the gas measurements obtained from the test borings included in the W-C Report (Tr. 89, 103). He further expressed the opinion that the tunnel was a Class I location. In support of his opinion he stated (Tr. 91):

That the presence of gas--the potential presence of gas--in ignitable quantities requires that the electrical be of Class I design.

Richards made no inspection of the worksite. His opinion was based on the W-C Report, references made in the report (Tr. 95), and information as to gas-producing possibilities of Cleveland Shale related to him by Kremzar or Coffelt (Tr. 96).

Richards testified that Class I wiring was an essential element of the overall safety program for underground construction in potentially gassy soils (Tr. 91). He stated that none of the recognized safety precautions utilized in underground construction alone were fail safe, i.e., ventilation, monitoring and elimination of ignition sources with explosion-proof fixtures and wiring (Tr. 92). According to Richards, mechanical ventilation frequently fails or is interrupted when duct work is added (Tr. 92). Furthermore, gas can enter a tunnel anywhere along the tunnel bore, not only at the tunnel face, and may go undetected by monitors (Tr. 93). Richards submits that the use of explosion-proof wiring and fixtures in potentially gassy operations is recognized in the tunnel industry and that respondent failed to utilize sound engineering judgment in its decision not to provide Class I wiring in this instance (Tr. 91, 94).

Richards expressed the opinion that even though monitoring fails to reveal any gas accumulations which approach 10 percent of LEL, the area is still considered "potentially gassy". He bases his opinion on the wording of § 1926.800(h)(ii) which states (Tr. 102):

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive limit for methane or other flammable gasses is likely to be encountered in such underground operations.

Richards refers back to the W-C Report as support for holding the tunnel "potentially gassy" under § 1926.800(h)(ii) (Tr. 103). He concedes that he is not aware of any prior tunnel construction in Cleveland Shale in which 10 percent of LEL of methane gas has been discovered for a period of 24 hours (Tr. 103-104).

The parties, the W-C Report, and all the witnesses on both sides are in agreement that the tunnel bore was made in Cleveland Shale and that Cleveland Shale is widely recognized as a gas-producing shale. The parties disagree as to the quantity of the gas present and whether the tunnel should be classified as a hazardous location as that term is referred to in § 1926.407(b).

Section 1926.407(b) uses the term "hazardous locations." Although the description of the allegation makes a statement that the tunnel was classified potentially gassy, the Secretary closely adheres to using the term "hazardous location" and its appropriate designation which she deems applicable to this

case, i.e., Class I, Division 2. K M & M shifts the terminology to a "gassy area" and a "potentially gassy area," which are the hazardous classifications used in § 1926.800(h). It asserts that the tunnel was not a potentially gassy operation, as defined by § 1926.800(h)(1), and that explosion-proof fixtures and wiring were not required. The Secretary contends that the argument concerning whether the tunnel was a "potentially gassy area" is not germane to the issue for determination. She points out that § 1926.407(b) is not predicated on there being a determination that the tunnel operations be found "potentially gassy."

The Secretary submits that § 1926.407(b) is predicated on there being a showing that the location in question "is one in which flammable gasses or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable atmospheres." This is basically the definition of a Class I location and is a hazardous location as that term is used in § 1926.407(b). Even if the Secretary's reasoning is accepted, she still has a burden to show that the quantities of gas or vapor in the air are sufficient to produce a flammable or combustible concentration. Sections 1926.407(b) and § 1926.449 do not set forth any criteria for making this determination. As the Commission noted in Continental Oil Company, supra, the definition of Class I, Division 2, does not establish any "unbending rules." A number of factors must be considered. Of foremost importance in a case such as this is the quantity of

flammable material in the tunnel and what constitutes a "flammable or combustible concentration" for purposes of the standard.

In support of the determination that flammable gasses or vapors were or may have been present in sufficient quantities to produce an explosion or ignitable atmosphere, the Secretary points to Mast's testimony that he believed that the area where the tunnel was excavated was an area where flammable gases "may be present in quantities sufficient to produce an explosive atmosphere" (Tr. 123). The question was prefaced on the word "may". There is no evidence to show that this condition was ever found to exist in the tunnel. Mast conceded that the readings made from the test borings did not indicate similar readings would be encountered in an 11-foot diameter tunnel. Mast also made it clear that they did not test for the quantity of the gas. They used the test bore holes to measure for the presence of gas (Tr. 116, 121). The report was prepared to alert bidders to the fact that Cleveland Shale contained gas (Tr. 115). There is no evidence that Mast was ever in the tunnel, and he had no readings or information on the condition of the tunnel. It is the tunnel and not the test bore holes that is in issue. All witnesses were in agreement that methane can be found in Cleveland Shale, but none stated the quantity of the gas. Without knowing the quantity of gas in the tunnel, it is not possible to determine if there was an explosive or ignitable atmosphere.

Section 1926.407(b) and § 1926.449 do not give any guidelines as to the quantity of gas that is required to produce a flammable or combustible concentration. The revision of § 1926.800, which became effective August 1, 1989, does provide guidelines in determining a hazardous classification applicable to a tunnel. Since § 1926.800 specifically applies to the construction of tunnels, its language in regard to hazardous classification takes precedence over the general provisions of §§ 1926.407(b) and 1926.449. The revisions in paragraph (h) added guidelines to assist in making a determination as to whether the tunnel is a hazardous location as that term is used in § 1926.407(b). Section 1926.800(h) merely defines a hazardous location in a tunnel and is entitled to priority over the general provision of § 1926.407(b). The new provision classifies "potentially gassy" operations and "gassy" operations on the basis of monitoring data which exceeds 10 percent or more of the lower explosive limits.

Paragraph (h) of § 1926.800 provides as follows:

(h) Hazardous classifications--(1) Potentially gassy operations. Underground construction operations shall be classified as potentially gassy if either:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm)  $\pm$ 0.25 inch (6.35 mm) from the roof, face, floor or walls in any underground work area for more than a 24-hour period; or

(ii) The history of the geographical area or geological formation indicates that 10 percent or more of the lower explosive

limit for methane or other flammable gases is likely to be encountered in such underground operations.

(2) Gassy operations. Underground construction operations shall be classified as gassy if:

(i) Air monitoring discloses 10 percent or more of the lower explosive limit for methane or other flammable gases measured at 12 inches (304.8 mm)  $\pm$ 0.25 inch (6.35 mm) from the roof, face, floor or walls in any underground work area for three consecutive days; or

(ii) There has been an ignition of methane or of other flammable gases emanating from the strata that indicates the presence of such gases; or

(iii) The underground construction operation is both connected to an underground work area which is currently classified as gassy and is also subject to a continuous course of air containing the flammable gas concentration.

(3) Declassification to potentially gassy operations. Underground construction gassy operations may be classified to Potentially Gassy when air monitoring results remain under 10 percent of the lower explosive limit for methane or other flammable gases for three consecutive days.

The definition of "potentially gassy" contains two alternative ways to classify a location as being "potentially gassy." Definite guidelines are set forth in each instance.

The first definition of "potentially gassy" pertains to the actual experience of the employer in the location. Although the parties' experts disagreed as to whether the tunnel was a potentially gassy operation, the Secretary argues that the gas measurements obtained from the test bore results contained in the W-C Report make it reasonable to conclude

that Cleveland Shale is a formation where 10 percent of the LEL is likely to be encountered. This argument is contrary to the standard. As previously pointed out, it is the tunnel that is in issue and not the test holes. The standard applies to underground construction operations. Representatives of the Secretary made no effort to measure the gas in the tunnel or to review the logs maintained by K M & M of its daily monitoring of the air.<sup>5</sup> The logs maintained by K M & M throughout the completion of Contract V reflected a zero reading for methane gas in the overwhelming number of instances. There was one reading of 11 percent LEL and one reading of 5 percent LEL during the entire project, including both the shaft and tunnel (Ex. R-5). The required 10 percent or more of the LEL for more than a 24-hour period was not established by the Secretary.

The second portion of the definition relates to classification when there is no actual experience in the particular operation. It relies on the history of the geological formation as an indicator, but it is not without a quantitative aspect. It requires that there be a likelihood of encountering 10 percent or more of the LEL for methane gas in such operations. The reference is clearly to tunneling and

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K M & M maintained a multiple monitoring system for testing the quality of the air in the tunnel. This included fixed monitors on the boring machine, hand-held monitors which were carried throughout the tunnel on a per shift basis, and surface monitors which took readings throughout the tunnel (Tr. 189-193). These readings were maintained in a daily log (Ex. R-5).

FINDINGS OF FACT AND  
CONCLUSIONS OF LAW

The findings of fact and conclusions of law contained in this opinion are incorporated herein in accordance with Rule 52(a) of the Federal Rules of Civil Procedure.

ORDER

Based upon the foregoing findings of fact and conclusions of law, it is

ORDERED: That the willful citation and proposed penalty issued to K M & M on November 9, 1989, are vacated.

*James D. Burroughs*  
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JAMES D. BURROUGHS  
Judge

Date: March 21, 1991