UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

FROM: Congressional & Legislative Office

TO: Code 100

Attached for your information are copies of the testimony on S. 3394 presented to the Senate Subcommittee on Energy Research and Water Resources on June 7, 1976.
Mr. Chairman and members of the Subcommittee, we are here today to present the Department's views on S. 3394, a measure to authorize the Secretary of the Interior to carry out certain engineering studies and implementation measures relating to safety and water quality improvement of the Leadville mine drainage tunnel.

As stated in the Department's letter of June 7, 1976, to the Committee, the Department recommends that the Committee defer action on the bill at this time pending further review by the Department and the Administration of various alternative solutions now under consideration. The Administration has not yet had time to establish its position with respect to the potential options, and further consideration is needed by the Department and other agencies. It is estimated that a satisfactory review can be completed in about 2 months.

The bill, if enacted would provide authority to conduct engineering investigations, stabilize and rehabilitate the Leadville mine drainage tunnel for public safety, and improve the quality of the tunnel effluent.
The tunnel is located generally east and north of the city of Leadville, Colorado. The tunnel effluent is discharged via a natural drain into the East Fork of the Arkansas River. Colorado Highway No. 91, the principal highway connection between Leadville and Denver, crosses the tunnel alignment near its portal. A 12-inch-diameter waterline carrying the domestic water to the city of Leadville also crosses the tunnel adjacent to the highway. A trailer court is located below the tunnel portal.

The Leadville mine drainage tunnel was constructed by the Bureau of Mines during the period 1943 through 1952 for the primary purpose of providing continuous water drainage of certain mines in the Leadville mine district. The tunnel is 11,299 feet long. The tunnel has not provided the benefits anticipated because a drop in ore prices resulted in closing most of the mines soon after the tunnel was completed. The Bureau of Mines continued a minimal maintenance program on the tunnel until 1959.

During the construction of the tunnel, it appeared that the drainage outflow might become available for use on the proposed Fryingpan-Arkansas Project. In 1951, the Bureau of Reclamation filed a water-right claim with the Colorado State Engineer for 20 cubic feet per second of discharge from the tunnel. To date, the filing has not been adjudicated. Outflow over the past several years has been between 3 and 4 cubic feet per second. For the claim to be adjudicated for that use, it would be necessary to demonstrate that such flows were not naturally tributary to the Arkansas River.
In 1959, because of its interest in the water supply potential of drainage outflow, the Bureau of Reclamation assumed custody of the tunnel when it was declared excess real property by the Bureau of Mines. The assignment of the tunnel to the Bureau of Reclamation was with the understanding that Reclamation did not intend to expend any funds for operation and maintenance of the tunnel.

Because of the lack of maintenance, the condition of the tunnel has deteriorated. The first 630 feet of tunnel are in unconsolidated glacial material and terrace gravels. As the timber sets and lagging rotted away, cave-ins developed, and collapsed areas appeared at the surface as sinkholes. The sinkholes were as much as 30 feet deep, and two were adjacent to the highway. The cave-ins are impeding the tunnel outflow. The water table in the glacial material above the tunnel has risen 20 to 30 feet since 1968. Probably the entire tunnel is filled completely with water.

Since 1968, the Bureau of Reclamation has undertaken various emergency measures to provide for public safety, utilizing funds appropriated for the Fryingpan-Arkansas Project. To date, $330,000 have been expended or obligated for these purposes. The principal measures have included:

1. Clearing and rehabilitating the first 200 feet of the tunnel and installing a bulkhead at that point.
2. Backfilling the surface sinkholes and placing gravel in approximately 450 feet of the uncollapsed tunnel from the bulkhead to a location just beyond the highway.

3. Installing observation wells to monitor ground-water conditions.

4. Installing a pump in the observation well above the highway to maintain the water table at a safe level until a permanent solution could be determined.

5. Acquiring 8 acres of land overlying the tunnel portal area.

6. Fencing around the hazardous sinkhole area.

The Bureau of Reclamation believes that the water trapped in the tunnel does not pose a threat to Leadville or the trailer court from the standpoint of a blowout. It is not probable, with the existing physical conditions in the tunnel area, that enough hydraulic head could develop to cause a 400-foot-long plug of silt, sand, gravel, cobbles, boulders, and steel sets to be blown from the tunnel. However, the buildup of ground water could cause instability in the hill near the tunnel outlet, and landslides might develop. Should this occur, it could have an adverse effect on State Highway 91, the Leadville water pipeline, and the trailer court.

Because no one has been beyond approximately 200 feet into the tunnel since 1959, any statement as to its condition can only be speculative. However, it is believed that the Leadville mine drainage tunnel is presently in a state of disrepair and deterioration.
The EPA has issued a point source discharge permit for the Leadville mine drainage tunnel in accordance with the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). The National Pollutant Discharge Elimination System permit establishes effluent standards which become effective on July 1, 1977. At present, the discharge contains concentrations of certain heavy metals in excess of the effluent limitations. When advised that the Bureau of Reclamation lacked authority and funding to provide treatment, EPA indicated that it would be willing to work with Reclamation in developing plans to achieve scheduled compliance.

Additional construction to develop a water supply from the Leadville mine drainage tunnel is not considered to be within the scope of the plan authorized for the Fryingpan-Arkansas Project, and the cost of such development cannot be justified for the incremental amount of water gained. Therefore, it is the Department's view that the Leadville mine drainage tunnel is not a part of the Fryingpan-Arkansas Project and that authority is lacking to request or expend funds appropriated to that project for the rehabilitation of the tunnel or for improving the quality of the tunnel effluent.

The Bureau of Reclamation has attempted to dispose of the United States interest in the tunnel both to Federal and non-Federal agencies or entities. Interest has been limited because of the apparent rehabilitation costs and water quality problem.
It is unlikely that substantial mining in the Leadville area will be resumed in the near future. Consequently, rehabilitating the complete tunnel for mining purposes should not be undertaken at this time unless there is a demonstrated need and then only with the financial participation of interested parties.

The first 1,000 feet of the tunnel is in unconsolidated materials and needs to be rehabilitated or stabilized for safety purposes. Most of the remainder of the tunnel is in bedrock formations and does not appear to constitute a serious safety hazard.

Several alternative measures are available which, it is believed, would provide public safety for the foreseeable future and maintain adequate drainage. One of these alternatives, installing a concrete lined, structural steel supported, 8-foot-diameter, horseshoe-shaped tunnel section for a distance of 1,000 feet, from the portal, would provide reasonable access to the rest of the tunnel for mining purposes. It is estimated that this work would cost $2.2 million. Other alternatives would be less costly. For example, a 6-foot-diameter steel liner plate installed in the first 1,000 feet of the tunnel would cost $1.7 million. A smaller diameter drainage pipe might prove feasible. Also, it might be possible to drill holes from the surface to the tunnel and to place gravel in the first 1,000 feet of tunnel to prevent the development of additional sinkholes (as was done earlier for some small sections as an emergency measure). However, drainage pipes or wells may also be needed.
If unrestricted drainage is reestablished, it is conceivable there could be a significant change in the need for treatment of the effluent because there would be less impounded water in contact with minerals. A monitoring program to collect and evaluate quantitative and qualitative data and to determine the need for treatment may be advisable. It would be desirable to coordinate any water quality improvement plans for the Leadville mine drainage tunnel effluent with similar plans for handling other mine drainage in the area.

These comments on the problems associated with the Leadville mine drainage tunnel are based on information gathered in the field. The Bureau of Reclamation, because of its current responsibility for the tunnel, has felt obligated to undertake certain emergency measures in the interest of public safety and to seek long-range solutions to the problems posed by the tunnel. The Bureau of Reclamation has no desire to continue its jurisdiction over the tunnel because the tunnel does not appear useful in connection with the Reclamation program. If the tunnel is to be retained for possible future use in connection with mining activities, it would appear appropriate for some other agency to assume the responsibility.

Appropriate action needs to be taken with respect to the public safety and water quality problems associated with the tunnel. As already indicated, the Administration has not completed its review of the available
data and, therefore, does not yet have a position as to what action
should be taken. However, that review should be completed in about 2
months, at which time a further statement as to the position of the
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