

ANNUAL REPORT
to the COLORADO WATER QUALITY CONTROL COMMISSION
from the HAZARDOUS MATERIALS and WASTE MANAGEMENT DIVISION
COLORADO DEPARTMENT OF PUBLIC HEALTH and ENVIRONMENT

SB 181 Implementation
COMPLIANCE WITH WATER QUALITY STANDARDS AND CLASSIFICATIONS
for the Fiscal Year Ending June 30, 2008

September 2008

This is the annual report provided to the Colorado Water Quality Control Commission (Commission, WQCC) by the Hazardous Materials and Waste Management Division (HMWMD). This report documents HMWMD activities that protect water quality in Colorado, support the mission of the Commission, and implement state water quality standards.

The paragraphs that follow present issues and examples of sites where releases have impacted ground water quality and where HMWMD decisions and actions concerning water quality classifications and standards have established clean-up criteria. There are numerous other examples, not chosen, where the state water quality standards have been used to determine the need for further site investigations or remediation to address chemical releases to the soil, ground water or surface water. For any site, added information that is of interest or use to members of the Commission will be provided on request.

GENERAL

HMWMD and WQCD have entered in to an MOU (finalized July 31, 2008) to resolve the issue of disposal of waste waters meeting the definition of solid waste to the ground and/or ground water. The MOU delineates the following:

1. HMWMD/Solid Waste will take authority for and regulate facilities that are discharging waste waters into surface impoundments or other engineered units, even those designed for purposeful seepage (no liner or seeping liner). These facilities are or resemble the fixed solid waste facilities currently regulated through Certificates of Designation (CDs). Using this approach, the Solid Waste Program (SWP) could ensure protection of human health and the environment through engineered design and operation. This includes waste water impoundments at drinking water treatment facilities.
2. HMWMD/Solid Waste will take authority for and regulate facilities that are undergoing some type of SWP-approved remedial action or cleanup of contamination.
3. WQCD/Discharge Permits will take authority for and regulate fixed and non-fixed/transient facilities that are discharging waste waters through land application or otherwise discharging waste waters to the ground (irrigation, dust-suppression, beneficial use, cement wash-out, semi-permanent cement plants, power washing, etc.). Discharges from these types of facilities are uncontained and protection of human health and the environment is determined via transport modeling to ground and surface water. These facilities have discharges that can meet groundwater quality standards 1) with no treatment, or 2) through some type of treatment or implementation of Best Management Practices (BMPs).

SOLID AND HAZARDOUS WASTE PROGRAM

Solid Waste:

No major changes have been made in the Solid Waste Program that alter the way in which HMWMD applies Colorado's water quality standards and classifications. HMWMD is still

working to upgrade our solid waste database to better track facility analytical data and compliance data. The Solid Waste Program continues to implement water quality standards and classifications in remedial cleanup actions, enforcement actions, and design and operations reviews for new or existing facilities.

Specific Site Summaries:

Black Mountain Solid Waste disposal facility had a release of benzene and brine contaminated wastewater to ground water several years ago that occurred because of a ripped impoundment liner. They have been very recalcitrant ever since in complying with our requests to characterize and remediate the ground water plume. We have issued two compliance advisories and have now filed a complaint in Mesa County District Court to compel compliance. In addition, on September 16, 2008, the Mesa County Board of County Commissioners temporarily revoked the facility's conditional use permit and certificate of designation until the ground water remediation system is installed and approved by HMWMD.

Hazardous Waste:

No major changes have been made in the Hazardous Waste Program over the last year, which is Colorado's equivalent of the federal Resource Conservation and Recovery Act, Subtitle C (RCRA) program. There have been no recent significant changes in implementing regulations that alter the way in which HMWMD applies Colorado's water quality standards and classifications for discharges to state waters, including ground water.

A review of the Hazardous Waste Program and the various mechanisms contained within the Colorado Hazardous Waste Statute and Regulations governing the protection of state waters may be found in the document entitled "Hazardous Materials and Waste Management Division Report Describing How Programs Are Assuring Compliance With Water Quality Standards and Classifications" (April 16, 1991). As discussed in that report, water quality standards are used as clean-up criteria unless a site-specific demonstration can be made showing that alternate concentration limits are equally protective of human health and the environment. The ability to establish site-specific ground water standards is limited to regulated units at facilities that are permitted to treat, store or dispose of hazardous waste. The regulatory ability to establish unit-specific alternate concentration limits does not apply to facility-wide corrective action. Nor does it apply to facilities that do not have or are not seeking a permit to treat, store or dispose of hazardous waste (i.e., illegal disposal sites). In these situations, the facility has the option of developing site-specific ground water standards, but they must do so by petitioning the Water Quality Control Commission for the adoption of the site-specific standard. Otherwise they must use the established standards as targets for the cleanup of releases.

The Hazardous Waste Program's Corrective Action Guidance Document, published in May 2002, provides an overall implementation framework and model scopes-of-work for site characterization, interim actions, evaluation of remedial alternatives and remedy implementation. Section 5.1.3.1 of the Corrective Action Guidance Document states that clean-up standards for ground water are established in "The Basic Standards for Ground Water" of the Water Quality Regulations (Section 3.11.0 in 5 CCR 1002-8). The guidance also informs facilities that they have the option of

developing site-specific ground water standards and petitioning the Water Quality Control Commission for their adoption.

Specific Site Summaries:

Colorado Soil Evaluation Values (CSEVs) were published on the HMWMD's website in December 2007. CSEVs are risk-based soil concentrations that were determined by HMWMD and the Disease Control and Environmental Epidemiology Division to be protective of human health and the environment, specifically ground water quality. The publication is a table listing a large number of chemicals and their associated screening/cleanup numbers calculated using standard risk assessment methods employing conservative exposure assumptions. These new table values have replaced the numbers contained within the HMWMD's December 1997 "Proposed Soil Remediation Objectives Policy" and the subsequent tables maintained by staff that listed soil numbers calculated in a similar fashion by facilities over the years. The table includes a column listing soil concentrations protective of ground water quality, values based on preventing the movement of contamination into underlying aquifers at concentrations that could potentially degrade water quality above State ground water standards, which are also listed in the table. A maximum contaminant level (MCL) equivalent method was used to calculate a risk-based water concentration for those constituents that did not have a State standard for the purpose of defining a soil value protective of ground water. As the Water Quality Control Commission modifies their State standards, so will we modify the soil concentrations protective of ground water in this table. A copy of the CSEV table may be found at <http://www.cdphe.state.co.us/hm/csev.pdf>.

Raytheon has begun implementing a long-term ground water remedy at their facility north of the City of Boulder. A combination of techniques is being employed to remove or treat in-situ volatile organic compounds (VOC) and the rocket fuel degradation compound NDMA. Chemical oxidation is used to transform both VOCs and NDMA in the Target Missile Fueling Area, a plume of limited extent confined within the facility boundary. The plume extending from a former surface impoundment area is being treated using several methods: enhanced biological degradation for contamination beneath a drainage, pump-and-treat for the area between the former surface impoundment and property boundary, and chemical oxidation for the plume that extends off-site. The goal of the remediation is to either attain the State ground water standards or prevent contaminants from migrating off-site above the standards in the future.

RADIATION PROGRAM

The Radiation Program, in part, regulates the operational activities and cleanup of present and former uranium processing, mining, and disposal facilities. It works to isolate the radioactive and heavy-metal laden wastes and by-products produced in Colorado from the environment. This program works in conjunction with CERCLA and RCRA programs in the Hazardous Materials and Waste Management Division and implements the Water Quality regulations for surface and ground water.

NORM/TENORM in Water Treatment Residuals: Program staff continued to work closely with Water Quality Control Division staff to implement the guidance document to address proper management and disposal of water treatment residuals that may contain elevated levels of naturally

occurring radioactive material (NORM) or technologically enhanced naturally occurring radioactive materials (TENORM). Hazardous Materials and Waste Management Division and Water Quality Control Division staff continued to work together to assess compliance for some of the smaller public water supply systems to help them meet treatment requirements while adequately addressing waste management issues for water treatment residuals in accordance with the draft guidance.

Lincoln Park / Cotter, Fremont County: Uranium and molybdenum continue to be monitored in ground water in the Lincoln Park Water Use Area (Operable Unit 2) near the Cotter / Cañon City uranium mill tailings site. The previous goal of 35 microgram per liter ($\mu\text{g}/\text{l}$) uranium that was set in 1988 has been revised to coincide with the groundwater standard set by the Commission. The Division approved a plan for soil remediation in the Old Ponds Area in the mill site (Operable Unit 1). This constitutes a major source of ground water contamination at the Cotter Mill facility. The Proposed Plan was evaluated and approved on its ability to meet groundwater standards at the Point of Compliance, utilizing the federal MCL of 30 $\mu\text{g}/\text{l}$ uranium. The Division also issued a Notice of Violation to Cotter Corporation for uranium exceedances in off-site ground water and under the golf course and required a corrective action plan to be submitted to address the contamination.

UMETCO Uravan: Removal of uranium mill tailings at the Umetco Uravan facility was completed a year ago, including the closure of the tailings ponds adjacent to the [Dolores] river. Umetco completed the cap over the consolidated tailings pile(s). Alternate Concentration Limits (ACLs) were developed and implemented for several contaminants in ground water. A long-term program of ground water and surface water monitoring is being developed to demonstrate that the ACLs continue to be protective of the river and that contaminant concentrations are stable or decreasing now that the source has been removed. At license termination, the facility will be transferred to the U.S. Department of Energy for long-term surveillance.

REMEDIAL PROGRAMS

Superfund Activities: The Comprehensive Environmental Response Compensation and Liability Act (CERCLA or Superfund) requires that remedies chosen to address hazardous substance releases must either meet existing standards or, in limited cases, waive those standards. During each remedy selection process, the Hazardous Materials and Waste Management Division (HMWMD) submits to the United States Environmental Protection Agency (EPA) a list of state regulations that are either directly applicable to a particular cleanup situation or which are relevant and appropriate requirements (ARARs). Water quality standards are identified after consultation with the Water Quality Control Division (WQCD). The following site summaries are provided for sites that, over the past year, had new activity related to compliance with water quality standards. Information on other Superfund sites can be provided on request.

The California Gulch/Leadville site encompasses much of the Leadville mining district, and impacts California Gulch, Evans Gulch, and the Arkansas River. Discrete cleanup projects at the site have been accomplished and largely completed over the past 10 years. CDPHE and EPA are currently assessing these actions to determine whether they are sufficiently protective. State standards for appropriate segments of the Arkansas River have previously been identified as applicable standards for the cleanup. In 2007 CDPHE Remedial Programs, in cooperation with the

CDPHE Water Quality Control Division, the Colorado Attorney General's Office, the Colorado Division of Wildlife, the U.S. Environmental Protection Agency and the U.S. Fish and Wildlife proposed changes to surface water standards for zinc and cadmium for segments 02b, 02c and 05 of the Upper Arkansas River based on a recalculation method. These revised standards will now be used to assess whether additional cleanup work is required at the site.

In 2008 the blockage and potential blowout of the Leadville Mine Drainage Tunnel made headlines for several months. As part of their emergency response actions at the site, EPA began pumping clean water from the Gaw Shaft to reduce head in the mine pool. This water was directly discharged to California Gulch. The water discharge water was monitored, using Arkansas River standards and a non-degradation approach to California Gulch to determine whether treatment was necessary prior to discharge. This approach to standards was worked out in discussions between EPA, HMWMD and WQCD. Pumping from the Gaw Shaft ceased when EPA completed a well into the Leadville Tunnel. Water from the tunnel is now being pumped directly to the Bureau of Reclamations' treatment plant.

The Eagle Mine in Eagle County consists of a mining complex and associated waste near the town of Minturn. Heavy metals contamination from mining operations has impacted soils, surface water and ground water. Under the selected remedy, the Eagle Mine is used to store contaminated ground water. The mine pool water and collected groundwater are then treated to state and federal standards prior to discharge to the Eagle River. Water quality in the Eagle River has been improving for several years as a result of cleanup activities that have been performed.

In 2005, CDPHE, EPA, the responsible party, and the local stakeholders attempted to reach consensus on new standards on Segments 5 and 9 of the Eagle River based on this improvement and the associated measured improvement in the aquatic community. Ultimately, the local stakeholders felt that additional improvement in river quality was needed, and they refused to support a permanent standard. In the December 2005 hearing, the Water quality Control Commission adopted new temporary modifications based on the ambient conditions. The Commission also instructed the division to meet with stakeholders to develop an acceptable proposal for permanent standards for the 2008 triennial review. After the December 2005 hearing, the CDOW suggested use of EPA's Recalculation Procedure, where water quality standards would be set based on a biological goal and would not be an ambient-based standard (as originally proposed in Dec. 2005.) At the June 2008 WQCC triennial review hearing, HMWMD proposed site-specific criteria based numeric standards for zinc, copper and cadmium for Segments 5a, 5b, 5c and 7b of the Eagle River. Once the stakeholders agreed to using the recalculation procedure, HMWMD then worked with the stakeholders to decide which species from the larger toxicity databases for zinc and copper should be included in the recalculation. The resulting equations for zinc and copper were based on the agreed-upon species list. However, it was determined that in some of the segments, the recalculated standards could not be attained, based on irreversible contamination. A Metals Loading and Attainability Analysis was prepared for the hearing, to demonstrate which standards would be attainable. In the end the WQCC adopted new underlying standards for copper, cadmium and zinc based on a slight modification of the HMWMD proposal to account for seasonality. Although the stakeholders did not agree with the load reduction analysis, the HMWMD believes that the further load reduction at the site will be difficult and the standards that were adopted are for the highest water quality that is attainable.

At the Lowry Landfill Superfund site, a new groundwater plume extending 2 miles north of the site was discovered. The discovery was due to improvements in the detection limit for 1,4 dioxane. State standards for 1,4 dioxane were identified as the cleanup goal. The responsible parties continue to actively pumping some areas of the plume, which they believe is a remnant from before the site remedy was constructed.

The Nelson Tunnel outside of Creede, CO is the newest addition to the National Priorities List. HMWMD has supplied a list of ARARs that include the appropriate stream standards for Willow Creek. EPA is currently performing a removal action to stabilize the Commodore waste rock pile prior to beginning the remedial investigation phase of the project.

At the Summitville Mine site in Rio Grande County the state and EPA continue to treat water in the old water treatment plant. This plant does not have sufficient capacity to treat all water in above average years. In 2007 the WQCC approved revised aluminum standards on segments 3b and 3c of the Alamosa River, in recognition of high background aluminum concentrations. This change in standards allowed for the redesign of the proposed new treatment plant, to eliminate a separate stage for aluminum. This redesign has now been funded by EPA and is in process. HMWMD is working with EPA to secure funding for the construction phase of the project.

Voluntary Cleanup and Redevelopment Activities: The Voluntary Cleanup and Redevelopment Act (VCRA) staff continues to encounter issues related to surface and ground water contamination. The staff works closely with the WQCD on each site-specific decision to assure compliance with the appropriate regulations. Meeting ground water standards is an ongoing issue at VCRA sites. Since these sites are most often the subjects of real estate transactions, the buyers and sellers try to assure that the cost of cleanup does not make the economics of the deal unfeasible. Therefore, most clean-up plans focus on source control or removal rather than treatment of contaminated ground water plumes. The VCRA staff strives to assure that any exceedance of ground water standards is contained on-site. Point-of-compliance wells are established at the property boundary. HMWMD requires any applicant that exceeds ground water standards at the property boundary to apply to the Water Quality Control Commission for a variance, a site-specific standard, or a change in point of compliance (unless this exceedance will only be temporary during cleanup activities and the applicant can show that no surface water body is impacted and no exposure is occurring during this period). This assures that the program complies with water quality regulations.