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, 2007

August 2007

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

In the fall of 2006, the WQCD became concerned that language in SB-181, at CRS 25-8-202(7)(b)(II), precluded them from issuing permits to entities that discharged polluted waste waters to the ground. The reason for this concern is because in most cases, polluted waste waters would meet the definition of solid waste. The HMWMD is an implementing agency for SB-181 and is in charge of the solid waste regulatory program. However, because of the way that the solid waste statutes and regulations are constructed, HMWMD was not regulating uncontained waste water discharges to the ground or ground water. WQCD was worried that the statutory language could be interpreted to say that, unless the WQCC made a finding that HMWMD is "failing to provide reasonable assurance that compliance with (the water quality requirements) has been obtained through its own programs," any permits issued by WQCD for ground water discharge might be vulnerable to legal challenge.

To resolve the issue, WQCD and HMWMD asked the Attorney General's Office for a legal opinion. That opinion indicated that the SB-181 statutory language was not as limiting as WQCD feared and that the matter could be decided through CDPHE policy. WQCD and HMWMD staff having been working on that policy, which should be finalized within the next few months. To prepare this policy, staff from both divisions are considering the following basic framework:

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:

A Preliminary Injunction was filed against Rivera's Vacuum Service, which is in the business of pumping septic tanks and sand traps. Mr. Rivera was dumping/disposing of septic material on his property. The groundwater is approximately 8-9" below ground surface and the Purgatory River is approximately 200' from one of the disposal sites. The site was investigated and it was determined that no further action was required based on no residual impacts to soil or groundwater. The penalty payments were received. The order obligations were satisfied.

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.

The Hazardous Materials and Waste Management Division and the Disease Control and Environmental Epidemiology Division are in the process of preparing a risk spreadsheet to replace the one in the December 1997 "Proposed Soil Remediation Objectives Policy Document". The spreadsheet 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. The table will also include 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. As the Water Quality Control Commission modifies their State standards, so will we modify the soil concentrations protective of ground water in this spreadsheet. The expectation is to have this spreadsheet available for publication on the Division's website sometime before the end of the 2007 calendar year.

USEPA will continue to re-evaluate the toxicity information for a fairly large number of chemicals over the next few years. The Division anticipates having to deal with other emerging chemicals of concern in the future. If it becomes necessary to establish ground water cleanup goals for these new chemicals of concern, we will do so in a manner consistent with how Colorado calculates its State ground water standards.

Specific Site Summaries:

Hamilton Sundstrand has closed and sold its facility in north Denver, the new owner implementing an aggressive program to cleanup both soil and ground water. As was stated in last years report to the Commission, ground water plume emanating from the facility travels several thousand feet through a highly transmissive aquifer, largely beneath vacant land that will be developed into a mix of commercial and residential properties. The cleanup objectives for ground water to 1) meet State ground water standards and 2) reduce solvent concentrations to the degree that it no longer poses a threat via the vapor intrusion pathway. In-situ reductive dechlorination of the solvent plume commenced in 2007 downgradient of the facility boundary, the test results showing that it is remarkably successful in reducing contaminant concentrations and the size of the plume. These promising results suggest that achieving State ground water standards off-site may be possible.

Snowflake Cleaners operates a dry cleaning facility off of Parker Road in Aurora. Testing confirmed that ground water was contaminated with the dry cleaning solvent perchloroethylene

(PCE). With the stated goal of cleaning up ground water to meet State standards, the facility owner began injecting BOS 100© into the subsurface to treat the PCE in-situ. BOS 100© is a liquid containing nano scale iron impregnated in an activated carbon base, the carbon capturing the orgainic compound and the iron treating it. Initial test results show that PCE concentrations in ground water have fallen below the State standards. If these conditions persist, as demonstrated through additional rounds of ground water sampling, the cleanup will have been deemed successful allowing to bring the corrective action process to an end.

Dry cleaners continue to be the number one new site with ground water impacts brought to our attention year after year. As was discussed in last years report to the Commission, the Division continues to use the March 2006 "Dry Cleaner Remediation Guidance Document" to direct the cleanup the highly mobile, high toxicity, recalcitrant solvent PCE at these sites. The Division is also looking at broadening its strategy to deal with releases from these sites by looking at other ways of identifying and cleaning up these sites: evaluating the potential of establishing a dry cleaner remediation program here within Colorado (the Tabor Amendment severely limits this opportunity); using Department contracted county inspectors to report evidence of releases when they perform air inspections at dry cleaning facilities; evaluate the possibility of strengthening existing regulations to do a better job of tracking waste generated and disposed of and; looking for other, easier means of collecting evidence to support issuance of cleanup orders. Development of these other tools will be dependent on funding resources and staff availability.

Rocky Flats Environmental Technologies Site (RFETS): Cleanup in the Industrial Area of the site is complete. Ground-water flow systems were modeled to ensure surface water standards would continue to be met. Long-term ground water monitoring will be performed to monitor any changes in contaminant levels in plumes and verify water quality and movement. Routine ground water monitoring has been significantly revised as part of the transition to long-term monitoring. The long-term Integrated Monitoring Plan (IMP) was developed with stakeholder input.

Zero-valent iron was replaced in the East Trenches Plume Treatment System and the Solar Ponds Plume Collection and Treatment System. Both systems continue to treat VOCs. Treatment of contaminated ground-water segments below the treatment systems are enhanced by phytoremediation. Remediation of portions of VOC plumes was also enhanced by chemical treatment via injection of hydrogen reducing compound.

Routine monitoring of surface water is implemented through the Integrated Monitoring Plan. Surface-water sampling is conducted in the operations areas and the three main surface water drainages. The IMP has been updated on an annual basis with stakeholder input.

Dams on the Walnut Creek and Woman Creek drainages will remain intact, except for Pond C-1 on Woman Creek. This pond has been notched on the north end. A new stop-log structure keeps shallow water impounded to support wildlife.

Surface water data collected by the state and DOE, with mapping and charting applications, is incorporated into the CDPHE website for stakeholder access. The web address is: www.cdphe.state.co.us/hm/rf/rfmaps.asp.

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 worked closely with Water Quality Control Division staff and a large group of internal and external stakeholders to develop a draft 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). The Hazardous Materials and Waste Management Division and the Water Quality Control Division jointly released the final document following a lengthy public review and comment period, intended to address water quality, solid waste, and radiation safety concerns. The guidance will enhance protection of water quality by promoting the proper management and disposal of water treatment residuals and radiation safety for NORM and TENORM, as appropriate.

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 / Canon City uranium mill tailings site. The previous goal of 35 μg/l uranium that was set in 1988 will be 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 μg/l uranium.

UMETCO Uravan: Removal of uranium mill tailings at the Umetco Uravan facility was completed this summer, including the closure of the tailings ponds adjacent to the [Dolores] river. Umetco will be completing the cap over the consolidated tailings pile(s) over the next year or so. 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. In order to do this a viable end goal must be established. State standards for appropriate segments of the Arkansas River have previously been identified as applicable standards for the cleanup. However, the standards were Table Values that were not achievable for the site.

Therefore, at the June 2007 Rule Making Hearing for the Upper Arkansas River, 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.

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 is then treated to state and federal standards prior to discharge to the Eagle River. The treatment plant on this site currently treats approximately 400 gallons per minute under a CPDES permit. Contaminated ground water under the consolidated tailings pile is collected via two trenches, and is also treated at the plant. Clean ground water is diverted around the pile by an interceptor trench. Water quality in the Eagle River has been improving for several years. 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. These meetings have been occurring, however a clear path forward is not yet evident. Concurrently, CDPHE is working with several entities to identify and remove additional loading from the river. Viacom has removed a waste pile, and is currently planning addition groundwater extraction and treatment in the Belden area. Ginn is planning a massive redevelopment at the site that would include additional mine waste cleanup in the Gilman area and groundwater extraction and treatment at Rex Flats. EPA is planning a waste pile stabilization upstream of the Superfund site. The question regarding standards is whether you base these standards on what is achieved following this work (allowing

for no assimilative capacity on the river) or whether it is based other factors such as protection of the aquatic community.

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 are actively pumping some areas of the plume, which they believe is a remnant from before the site remedy was constructed.

The Standard Mine outside of Cripple Creek, CO was listed on the National Priorities List in 2005. HMWMD has supplied a list of ARARs that include the appropriate stream standards for Elk Creek and Coal Creek. EPA is currently in the remedial investigation phase of the project, and is simultaneously performing work on the tailings pile as a removal action.

At the Summitville Mine site in Rio Grande County the state and EPA continue to treat water in the old water treatment plant at an increased rate of approximately 1400 gpm, which was made possible by several improvements to the plant. Despite treating a record 300 million gallons of water at the site, 21 million gallons of relatively clean water were bypassed. A new water treatment plant has been designed with the capacity to treat at 1600 gpm and the ability to remove copper and aluminum to lower levels than the current treatment plant. EPA's National Remedy Review Board has evaluated the new water treatment plant and has recommended that the coast of a two-stage plant is not warranted, due to the large upstream concentration of Aluminum in the Alamosa River. As a result, EPA has withheld federal funding to construct the new water treatment plant. In response, HMWMD prepared a revised Use Attainability Analysis to support a proposed change in the aluminum standard on segments 3b and 3c of the Alamosa River. This proposal, which was modified to gain stakeholder support, was presented at the June 2007 WQCC hearing. The revised standard will now be the basis for a revised treatment plant design. HMWMD is working with EPA to secure funding for this 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.