

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, 2009

December 2009

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

Ground Water No Further Action Determinations - Since its first inception back in the 1980's, the HMWMD's hazardous waste cleanup program has gradually been evolving as a result of regulatory changes, the development of new remedial technologies, new contaminants of concern, new media to consider and experience gained applying all available tools to the remediation of environmental contamination. The hazardous waste cleanup program is once again in the process of evolving in light of the difficulties we are experiencing restoring sites to a pristine condition, including cleaning up ground water to meet state standards throughout the affected aquifer.

Twenty plus years of experience reveal that the cleanup of mobile, recalcitrant chemicals (particularly the chlorinated volatile organic compounds) in certain hydrogeologic environments to meet strict numeric standards is difficult to impossible to achieve without expending considerable resources, far out of proportion to the risks posed by the contamination. Although contaminants may have made their way to ground water, in many cases there is no exposure, and therefore no risk posed by this contamination: it is found at depth, ground water is not in use, and it does not pose a vapor intrusion risk. On top of that, water quality may be poor to begin with and the formation through which ground water is moving is low yielding, not enough for a traditional domestic use well. The natural question is: if no one is exposed and no one is using it, why spend considerable resources cleaning it up quickly to achieve drinking water standards if these same concentrations can be achieved through natural attenuation over a longer period of time?

At some sites the requirement to remediate and monitor ground water can be an open-ended commitment, with uncertainties making it difficult to reliably predict when numeric standards will be achieved in all areas of the plume. The question that arises in these situations is how long the party responsible for the cleanup will be required to remediate and monitor ground water. This is more of a concern today as the large, resource-endowed facilities are being cleaned up, only to be replaced by small resource-poor facilities that have contamination problems similar to the large facilities.

As a consequence of these hard earned lessons, the HMWMD has embarked on a process of trying to come up with a set of criteria by which it can make a decision that no further action is needed

before all areas of a ground water plume have been successfully remediated to state standards. Internal discussions have identified about a dozen criteria that would need to be satisfied prior to our making a decision to close a site before standards have been met in all areas. That list includes a combination of source control measures, data trends, risk evaluation and the use risk management tools to prove the residual contamination will pose no risk to human health and environment, regardless of whether or not the HMWMD remains involved at the site in the future. Other states and programs across the country have already moved in this direction, factoring in the risk posed by contamination in their remedial action decisions. The HMWMD's goal is to eventually prepare a document that defines what these new objectives are so they may either be considered early in the cleanup process or much later when the best available remedial efforts are proving unsuccessful at meeting desired goals.

Independent of the actions described above, attorneys and environmental consultants tasked with representing small facilities in Colorado invited the HMWMD to participate in an informal work group to look at some of the difficulties they face cleaning up chlorinated solvent plumes, specifically at dry cleaning establishments. The difficulties we are all experiencing include: there are no reliable techniques that easily cleanup chlorinated solvents in fine-grained formations prevalent on the Front Range and the parties doing the cleanup don't have unlimited resources to spend on cleanup (the property owner almost always gets stuck cleaning up the dry cleaners mismanagement of the waste). Given the resources available, cleaning up ground water to achieve state standards is nearly impossible.

The purpose of this work group is to find solutions to the problems we each face at these hard to remediate sites. It is a fortunate coincidence that the efforts of the HMWMD's internal work group will play a major role in discussions we have with the external parties. Development of guidance or policy on the subject will provide the regulated community with more realistic cleanup objectives earlier in the process that they may have a greater chance of achieving. Written documentation will also ensure the consistent application of the no further action criteria amongst staff within the HMWMD. Our intent is to involve the Water Quality Control Commission in all phases of this development process.

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. However, internal discussions are underway with regard to how the HMWMD will apply the ground water standards at low risk sites involving recalcitrant chemicals in difficult to remediate hydrogeologic environments (see discussion below)

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:

Hamilton Sundstrand

Parties tasked with the cleanup and redevelopment of the former Hamilton Sundstrand facility have been operating remedial systems both on and off-site to treat ground water contaminated with volatile organic compounds. Two different systems are employed for this purpose. The first involves operating ground water sparge and vapor extraction systems for the purpose of stripping off the mobile constituents from soil and ground water, reducing the potential for contaminants to continue degrading ground water quality. The second remedy is located off-site, an injection system that uses a dilute molasses solution to enhance the biological degradation of contaminants in ground water. Unlike the difficulties remediating ground water noted in the paragraphs above, site conditions at the former Hamilton Sundstrand facility are conducive to the successful in-situ treatment of typically recalcitrant chemicals. The operation of these systems over the last two years has resulted in a dramatic improvement in water quality, such that it is conceivable that they may achieve their goal of meeting State standards in large areas of the half-mile long ground water plume in the next year or two.

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 of 30 micrograms per liter set by the Commission. The Division approved plan for soil remediation in the Old Ponds Area in the mill site (Operable Unit 1) has been implemented. This soil was 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. The Division also issued a

Notice of Violation to Cotter Corporation for excess uranium 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.

REMEDIATION PROGRAM

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 Clear Creek site encompasses much of the upper Clear Creek watershed, from the continental divide to Idaho Springs. Over the years, work along the main stem has been completed, including the capping of several mine waste piles and the construction of a water treatment plant for the Argo Big 5 tunnel discharges in Idaho Springs. Work continues on the North Fork, with the capping of waste piles and the construction of sediment control structures completed this year. The Record of Decision also calls for the treatment of discharges from the Gregory incline and National Tunnel in Black Hawk.

The Colorado Water Quality Control Commission (WQCC) conducted its triennial review of the South Platte River Basin, including Clear Creek, in June of 2009. In the months preceding the June 2009 rule-making hearing, HMWMD worked with the WQCD, EPA, and several stakeholders within the Clear Creek basin to develop changes to the classification and numeric standards for several segments of Clear Creek impacted by Superfund activities within the basin.

Data collected during long-term monitoring of the Superfund Site were used to support proposed changes to Regulation 38¹, including development of several new stream segments and changes to the numeric zinc standards in several segments. Re-segmentation of Clear Creek included the following:

¹ Regulation 38 – Classification and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smokey Hill River Basin

Clear Creek 2a: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from the I-70 bridge above Silver Plume to a point just above the confluence with West Fork Clear Creek, except for specific listings in Segments, 3a and 3b. The re-segmentation of Segment 2 was necessary in order to better represent differences in water quality between this segment and Segments 2b and 2c.

Clear Creek 2b: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from the confluence with West Fork Clear Creek to a point just below the confluence with Mill Creek, except for specific listings in Segments 4 through 8. The re-segmentation of Segment 2 was necessary in order to better represent differences in water quality between this segment and Segments 2a and 2c.

Clear Creek 2c: This segment was created to encompass the mainstem of Clear Creek, including all tributaries and wetlands, from a point just below the confluence with Mill Creek to a point just above the Argo Tunnel discharge, except for specific listings in Segments 9a, 9b, and 10. The re-segmentation was necessary in order to better represent differences in water quality between this segment and Segments 2a and 2b.

In addition to re-segmentation, the WQCC adopted site specific zinc standards for several Clear Creek segments. Recalculated acute and chronic zinc standards were adopted for Clear Creek Segments 2a, 2c, 3a, 3b, and 11. The recalculated equations were developed to be protective of the community which is expected to occur in the Upper Clear Creek Watershed.

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. In 2009 HMWMD received “stimulus funding” to begin construction of the new treatment plant. Construct began in September, and is targeted for completion in 2011. Construction of the new plant will allow us to meet standards in segment 3b and 3c of the Alamosa river.

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 ground water standards are met 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 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.