



## COLORADO

Department of Public  
Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

### COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

#### HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

### POLICY FOR CONDITIONAL CLOSURE OF LOW-THREAT SITES WITH RESIDUAL GROUND WATER CONTAMINATION

The attached policy describes the conditions that must be present before a determination that no further active remediation or monitoring are necessary at a contaminated site where ground water contamination in excess of the Colorado Ground Water Standards remains.

*The policies and procedures set out in this document are intended solely for the guidance of division personnel. They are not intended to and cannot create rights, substantive or procedural, enforceable by any person or party for any purpose. The division reserves the right to be at variance with this policy. The division also reserves the right to change this policy at any time with appropriate publication.*

October 2014

Gary Baughman  
Division Director

10/24/14  
Date



## INTRODUCTION

For sites where ground water contamination remains in excess of the ground water standards contained in Water Quality Control Commission Regulations No. 41 (Water Quality Regulation No. 41) and 42 (Water Quality Regulation No. 42), 5 C.C.R. 1002-41 and 5 C.C.R. 1002-42 respectively, the Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the division) has discretion to determine when a site can be closed and ground water quality monitoring at the site can be discontinued. This determination occurs after completion of active remediation and after evaluating the threat posed by any residual contamination.

Conditional closure under this policy may be proposed by division staff, site owner/operators, or other responsible parties. The division will use the conditions listed in this policy as the basis for evaluating sites that have requested a conditional closure determination. Supporting documentation must make clear that all policy conditions have been met. Regardless of the criteria listed on the checklist, the division retains complete discretion to decide if no further active remediation, monitoring and/or site closure is warranted.

The division has prepared a guidance document, *Guidance for Conditional Closure of Low-threat Sites with Residual Ground Water Contamination*, which is intended to be used in conjunction with this policy.

## OTHER CONSIDERATIONS

- A conditional closure determination under a remedial program does not preclude the state from seeking damages related to injury of the water or other natural resources under common law and CERCLA or the Oil Pollution Act (i.e., natural resource damages).
- The decision to close a site under this policy is based on the information known to the division at the time. The division may change or revoke a conditional closure decision based upon receipt of information that was not previously provided.
- A conditional closure determination will generally result in a significant reduction in the division's involvement at a site. As such, future protection of human health and the environment may be reliant on an institutional control as the sole enforcement mechanism for a site. Therefore, the division must be certain that all lines of evidence have been satisfied before making this determination.
- Sites regulated under the following programs are not eligible for closure under this policy:
  - Superfund National Priorities List (NPL) sites and NPL-caliber sites, considering the Hazard Ranking System (HRS) criteria. Current processes at these facilities allow for site-specific decisions regarding continued active remediation and frequency of monitoring, whether through discussions with the division or through the five-year review process.
  - Regulated units at permitted RCRA treatment, storage and disposal facilities (TSD); regulated units at RCRA TSD facilities will be closed as required by the permit. These are defined as surface impoundments, waste piles, land treatment units or landfills that were in existence on November 19, 1980 and qualified for interim status, that certified closure before January 26, 1983, or that received waste after July 26, 1982 but for which a permit has not yet been issued. However, solid waste management units that were used to manage, store or dispose of solid waste prior to July 26, 1982 that are subject to the corrective action requirements of §264.101 in the Colorado Hazardous Waste Regulations are eligible for consideration under this guidance and policy. See the flowchart in Appendix B for determining whether a solid waste management unit is eligible or not.

This policy will not be applied at Voluntary Clean-up Program (VCUP) sites, unless requested by the applicant. However, many of the same concepts may be used by the Division in VCUP application reviews.

- Sites closed under this policy are granted a "conditional closure," but not a "no further action" ("NFA") determination. NFAs are reserved for sites that have met the Water Quality Control Commission's Regulation 41 water quality standards.

HAZARDOUS MATERIALS & WASTE MANAGEMENT DIVISION

CONDITIONAL CLOSURE DETERMINATION CHECKLIST

Site Name and/or EPA ID#: \_\_\_\_\_
Site Owner: \_\_\_\_\_
Site Operator/type of use: \_\_\_\_\_
Site Address: \_\_\_\_\_

For sites with contamination in ground water at concentrations in excess of either the Colorado ground water standards or health-based remediation goals approved by the division in the absence of a ground water standard, the division has the discretion to determine whether no further monitoring and/or no further active remediation are necessary. However, at a minimum, all of the following conditions must be met before the division will make such a determination:

- 1. The source area has been remediated to the extent practicable.
2. The plume size is either stable or decreasing in all dimensions.
3. The concentrations of contaminants in the plume are either decreasing or predicted to decrease.
4. The ground water will meet Water Quality Regulation No. 41 water quality standards within a reasonable period of time.
5. Contaminant concentration trends are not dependent on the continued operation and maintenance of active remediation systems or containment systems.
6. There are no existing or reasonably anticipated exposures above standards or screening levels through cross-media transfer including volatilization into buildings1.
7. There are no uses of ground water down gradient of the site that would be threatened by the plume.
8. There is no discharge to surface water in excess of surface water standards2.
9. There is no potential for the plume to cause an exceedence of a ground water quality standard in an adjacent aquifer.
10. For sites that have satisfied all of the above conditions, the division will require either implementation of an institutional control in compliance with C.R.S. §§25-15-317 – 327 or alternate concentration limits in compliance with 6 C.C.R. §264.94(b).3
o Date of institutional control \_\_\_\_\_, or
o Date alternate concentration limit established \_\_\_\_\_
Public notice provisions have been satisfied.

Comments: \_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_
\_\_\_\_\_

Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_
Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

1 Sites where currently active vapor mitigation systems must continue to operate in order to eliminate exposure do not satisfy condition #6 and are not low threat sites. Sites where vapor exposure could occur in future buildings or homes built on the site may be eligible for closure under this policy if this possible exposure is prevented in an institutional control.
2 Discharges to surface water are regulated under the federal Clean Water Act and Colorado Water Quality Control Act.
3 Institutional controls in compliance with C.R.S. §§ 25-15-317 – 327, including environmental covenants and restrictive notices, are not required for conditional closure determinations on Voluntary Cleanup Program sites. C.R.S. §25-15-101(4.5)(a-h) identifies which environmental remediation projects require an institutional control if unrestricted use cannot be achieved. Failure to comply with the existing and proposed uses identified in the application effectively voids the Voluntary Cleanup Program’s determination that the approved remedy is protective.

# Guidance for Conditional Closure of Low-Threat Sites with Residual Ground Water Contamination



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Colorado Department  
of Public Health  
and Environment

**Hazardous Materials and Waste Management Division  
(303) 692-3300**

**September 2014**

*NOTICE: This guidance does not modify, replace, or pre-empt any existing statutory or regulatory requirements, enforcement actions, agreements, policies or other legal mechanisms that may govern actions within the Department's various remedial programs. This guidance is meant to inform the regulated community of their opportunity to close low threat sites: it is not regulation, nor does it constitute an enforceable standard that must be complied with. This guidance is not intended to and cannot create rights, substantive or procedural, enforceable by any person or party for any purpose. In the event of a conflict between this guidance and existing programmatic requirements, this guidance defers to various legal and operating mechanisms of those remedial programs.*

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## INTRODUCTION

This guidance is intended to be used along with the *Policy for Conditional Closure of Low-Threat Sites with Residual Ground Water Contamination* (the policy). In the policy, low-threat sites are defined as sites that meet all 10 of the following conditions:

1. The source area has been remediated to the extent practicable.
2. The plume size is either stable or decreasing in all dimensions.
3. The concentrations of contaminants in the plume are either decreasing or predicted to decrease.
4. The ground water will meet Water Quality Control Commission Regulations No. 41 (Water Quality Regulation No. 41, 5 C.C.R. 1002-41) water quality standards within a reasonable period of time.
5. Contaminant concentration trends are not dependent on the continued operation and maintenance of active remediation systems or containment systems.
6. There are no existing or reasonably anticipated exposures above standards or screening levels through cross-media transfer including volatilization into buildings.
7. There are no uses of ground water down gradient of the site that would be threatened by the plume.
8. There is no discharge to surface water in excess of surface water standards.
9. There is no potential for the plume to cause an exceedance of a ground water quality standard in an adjacent aquifer.
10. For sites that have satisfied all of the above conditions, the division will require either implementation of an institutional control in compliance with C.R.S. §§ 25-15-317 – 327 or alternate concentration limits in compliance with 6 C.C.R. §264.94(b).

This guidance provides a framework for evaluating and demonstrating that the conditions at a low-threat site justify a conditional closure determination. Evaluation of conditional closure eligibility will occur within the context of all other characterization and/or remedial activities that have already been completed at the site. Conditional closure determinations will be based on the following site-specific lines of evidence:

1. Characterization of the site;
2. Remediation of source areas (Policy Condition 1);
3. Evaluation of exposure pathways (Policy Conditions 6, 7, 8, 9);
4. Demonstration of natural attenuation processes (Policy Conditions 2, 3, 5);
5. Estimation of the timeframe for achieving remediation goals (Policy Condition 4);
6. Ability to enact, implement and maintain institutional controls over time (Policy Condition 10);
7. Applicability of alternate concentration limits (Policy Condition 10).

All lines of evidence will be considered by the division when reviewing a conditional closure request. However, not all the activities, data and/or assessments listed under each line of evidence need to be performed or collected in order to demonstrate that the conditions have been satisfied, depending on site-specific conditions. These activities, data and/or assessments should be considered part of a toolbox that may be used for the purpose of demonstrating that all

conditions have been met, along with any other site-specific information that the applicant deems important.

This guidance and the associated policy shall neither limit nor minimize the EPA's oversight and/or enforcement authority at any sites or facilities that the division concludes is eligible for conditional closure.

### **LINE OF EVIDENCE 1: CHARACTERIZATION OF THE SITE**

The site must be characterized to the degree necessary to understand the source of the contamination, its nature and extent, its fate and transport, and the potential for human or biotic exposure to the constituents of concern. Sufficient data should be available to develop a conceptual site model upon which to base corrective measures, and to assess any potential threat to human health and the environment. The following is a list of site-specific data and information that should be well understood and adequately documented recognizing that the type and quantity of data needed is dependent on site-specific conditions, including the magnitude of the impact to ground water:

- Nature and quantitative distribution of the source areas and ground water plume
  - Data collection in three spatial dimensions over time, where appropriate.
  - Contaminant distribution within the environment (i.e., nature and extent).
  - Contaminant concentrations, including all breakdown products, across the affected area and how they change with time.
  - Sources of the contaminant, including primary and secondary source areas.
  - The estimated quantity of the mass of contamination remaining in impacted media.
  - Contaminant phase distribution and partitioning between soil, ground water, and soil gas.
  - Physical and chemical characteristics of the discharge, including its potential for migration.
  - Existing quality of ground water and surface water, including other sources of pollution and their cumulative impact on water quality.
  - Potential for the pollutants to attenuate or degrade and the nature of the breakdown products.
  - How all of these factors are likely to vary with time.
  
- Site hydraulic, hydrogeologic, chemical, and geologic context
  - Hydrogeologic characteristics of the site and surrounding land.
  - Quantity of ground water and surface water and the direction of ground water flow, including preferential pathways.
  - Hydrogeologic and geologic parameters and strata.
  - Patterns of rainfall in the region and the proximity of the site to surface waters.
  - Geochemical and biochemical data.
  - Proximity and withdrawal rates of ground water users and the potential future changes to ground water flow based on these uses.
  - Interaction of ground water and surface water.

- All potential exposure pathways that the pollutants pose to human and ecological health, water resources, and the environment.
- Site uses
  - Present and reasonably anticipated future uses of ground water and surface water in the area. The potential for future ground water use should include review of all relevant information, such as: 1) USGS and Colorado Division of Water Resources water resources publications, 2) ground water protection plans and water classifications established by the Water Quality Control Commission, 3) local ground water management plans, 4) municipal water supply production and monitoring well locations, 5) domestic water well locations, 6) local land and water use/supply plans and/or 7) other site-wide studies available for a particular aquifer.
  - Shallow ground water is generally assumed to be in hydraulic communication with a deeper aquifer when a substantial, competent aquitard is not identified or when data are not available. Therefore, shallow ground water is assumed to be a potential drinking water supply unless a demonstration can be made that the shallow ground water is not reasonably expected to be used in the future, is not in hydraulic communication with a deeper aquifer that may be in use or have the potential to be used or existing water quality due to natural or anthropogenic derived contaminants (attributable to other unrelated sources) precludes the future use of the ground water. Such data may include, but not be limited to, aquifer pumping tests, existing aquifer well data, historic geologic or hydraulic data, or other competent information.
  - Planned current and future use of the site.
  - Potential adverse effects that either the contamination or an institutional control may cause to future development plans.

The conceptual site model is a representation of the ground water flow and solute transport system over time. This model conveys what is known or suspected about contamination sources, release mechanisms, the fate and transport of the contamination, the site's biochemical and geochemical conditions and exposure pathways. It should take into consideration historic, current, and future conditions. The conceptual model may include a narrative, a diagram, and/or a chart. A conceptual site model is not synonymous with "computer model" or "simulation model;" however, a computer/simulation model may be helpful in characterizing the site, particularly the transportation and attenuation of contaminants in ground water. The conceptual site model should constantly be evaluated during the site characterization process for data needs and consistency. It is important to collect field data to test the conceptual model, and not "force-fit" site data into a preconceived, and possibly inaccurate, conceptual representation.

There is no quantitative method for determining whether a site has been adequately characterized. Division personnel will apply professional judgment in each case, factoring in such site-specific elements as: the cause of the suspected release, the chemicals of concern, the complexity of the site hydrology and hydrogeology, the magnitude of the problem, and the potential for future exposures.

**LINE OF EVIDENCE 2: REMEDIATION OF SOURCE AREAS**  
*(This section describes how Policy Condition 1 can be satisfied)*

When evaluating a request for conditional closure, the division will consider whether the remaining levels of contamination in ground water can still be effectively treated using readily available technologies that have a reasonable chance of success to further remove, treat or enhance natural attenuation rates, thereby reducing the time needed to eventually achieve the Colorado ground water standards. In general, sites with contaminant concentrations greater than 10 to 20 times the ground water standards will require continued treatment, while those with lower concentrations will be evaluated to determine whether they have reached that point of diminishing returns and are more suitable for natural attenuation processes. Regardless of whether contaminant concentrations in ground water are above or below this 10 to 20 times threshold, all decisions on whether a site may be suitable for conditional closure will be dependent on site-specific characteristics, as discussed throughout this document.

Natural attenuation will be the primary mechanism by which qualifying low-threat sites will achieve the cleanup of residual contamination in ground water given sufficient time. The division expects that the Colorado ground water standards (or health-based remediation goals approved by the division in the absence of a ground water standard) will eventually be achieved at some future date. For many plumes (including chlorinated solvent and other organics), the rate of natural attenuation will not be sufficient to overcome source loading without rigorous source removal and/or plume remediation to directly destroy/eliminate pollutants and/or enhance natural attenuation. Therefore, the primary source area (waste and contaminated soil where the release occurred) and secondary source areas (contaminated ground water and formation materials causing re-entrainment) must be remediated to the extent practicable. More specifically, this includes remediation of residual contaminants entrained within or sorbed to soil, sediment, or bedrock that could continue to contribute to ground water contamination, to the extent that the Colorado ground water standards (or health-based remediation goals) remain unattainable over time. A good faith effort must be made to remediate source area waste material still residing in the environment and any associated soil and ground water contamination using appropriate treatment technologies that are reasonably available, practical, and technically feasible. A site is not eligible for conditional closure until active remediation systems or engineered structures are no longer necessary.

There may be situations where source identification and remediation is problematic. For example, the source may no longer exist or be of a size or in a location that makes finding and characterizing it difficult based on the available resources or technologies. Similarly, the magnitude and extent of contamination in the source area may be such that it is no longer impacting ground water quality. The division has the discretion to decide whether the magnitude of the observed contamination in soil or ground water necessitates further investigation or active remediation, relying on the demonstrated reduction of contaminant concentrations in the plume as an indication of whether the original source of the contamination is still present or below levels of concern. In such cases, the ground water monitoring data could become the primary basis for making decisions regarding the persistence of the suspected source area continuing to degrade ground water quality and whether natural attenuation could be effective without active remediation.

If residual primary or secondary source contamination exists in soil at the time a request for conditional closure is made, monitoring results and or fate-and-transport modeling must be conducted using site-specific conditions. These studies must be adequate to demonstrate to the division that any residual contamination will not leach into the ground water at concentrations that exceed the appropriate ground water standards. In addition, monitoring test results must be provided to the division. The division will evaluate if residual source material will leach or diffuse at a rate that will impede natural attenuation processes and result in failure to attain the Colorado ground water standards in a timely manner.

Strong sorption of contaminants to soils, contaminant entrapment (e.g. dense non-aqueous phase liquids), or complex geology due to heterogeneity or fractures may make meeting cleanup objectives at some sites difficult to accomplish. Unless these types of sites are remediated to the extent needed to stabilize and eventually reduce the contaminant concentrations in ground water in a self-sustaining manner through natural attenuation, they will be ineligible for use of natural attenuation as a remedy for the purpose of a conditional closure determination.

**LINE OF EVIDENCE 3: EVALUATION OF EXPOSURE PATHWAYS**  
*(This section describes how Policy Conditions 6, 7, 8 and 9 can be satisfied)*

An evaluation of all potentially significant exposure pathways to human health need to take into consideration the following:

- The potential for health impacts caused by human exposure, including consumption, inhalation, and dermal contact to remaining ground water contamination at, and downgradient of, the site.
- Potential for future human health or environmental exposures based on changes to site use or use of surrounding properties.
- Existing or reasonably anticipated exposures through cross-media transfer including volatilization into buildings.
- Hydraulic connections to surface waters or other aquifers.
- The potential damage to wildlife, crops, vegetation and physical structures caused by exposure to remaining ground water contamination.
- Potential discharge of contaminants to surface water, recognizing that such discharges are subject to regulation under the Clean Water Act.
- The availability, feasibility and long-term durability of institutional controls, or for sites being remediated under the Voluntary Cleanup Program, the restrictions listed in the division's no action determination letter, to mitigate potential exposures posed by the residual contamination. The only exceptions to this requirement are for sites that apply for and are granted a site-specific ground water quality standard through the Water Quality Control Commission, as set forth in Water Quality Regulation No. 41, or an

alternate concentration limit where the residual contamination in ground water is determined to not pose a substantial present or potential hazard to human health or the environment (see Appendix A).

For plumes containing volatile organic compounds, when the data and site-specific characteristics suggest the potential for vapor intrusion exists, the vapor intrusion pathway must be evaluated through direct testing of buildings above the ground water plume, unless other division approved methods are employed to accurately assess this pathway. Data must be provided showing that vapor intrusion is not occurring, i.e., measured values are equal to or below background or health-based concentrations (a hazard quotient of one for non-carcinogens or concentrations that represent an excess upper bound lifetime risk to an individual of  $1 \times 10^{-6}$  for carcinogens, whichever is more stringent).

The division requires a high degree of confidence that there are no current or reasonably anticipated future exposures to contamination because a conditional closure determination will generally result in a significant reduction of division involvement/oversight at a site. This greatly reduced level of oversight (limited to annually verifying compliance with institutional controls) is not suitable for determining the adequacy of on-going inspection, maintenance and/or operation of remediation systems that might be necessary to prevent exposures. Therefore, if active remediation of ground water or indoor air mitigation is required in order to prevent exposure to contaminants via any exposure pathway, this line of evidence has not been satisfied. In addition, even though the environmental covenant law expressly contemplates controls that would require on-going maintenance and/or operation of remediation systems to ensure long-term effectiveness, a site is not eligible for conditional closure under this guidance if institutional controls are necessary to maintain active remedy components in order to protect human health. Active remedy components would include such things as continued operation of vapor mitigation systems on properties the facility owner/operator may have no control over, but would also include engineering controls that must be maintained and/or monitored.

#### **LINE OF EVIDENCE 4: DEMONSTRATION OF PLUME STABILITY AND CONCENTRATION TRENDS**

*(This section describes how Policy Conditions 2, 3 and 5 can be satisfied)*

Using the conceptual site model as a foundation, it must be demonstrated to the division that the contamination plume is stable or decreasing in size in all dimensions and concentrations of contaminants, and their degradation products, in the plume are decreasing or predicted to decrease without the need for active remediation or containment systems. This may require analytical or numerical simulation of complex attenuation processes, the collection of additional biochemical or geochemical data, site or laboratory studies and/or assessing biodegradation using compound-specific isotope analysis.

##### **A. Is the plume stable or decreasing in size and magnitude?**

The plume size in all dimensions must be stable or decreasing. The plume is defined as the extent of contamination in ground water in all dimensions with concentrations in excess of the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard). It must be demonstrated to the division using ground water monitoring data and,

if applicable, fate and transport modeling results, that the plume is stable or shrinking under natural conditions (i.e., the natural flow regimen has been restored following any treatment of ground water). If monitoring data do not demonstrate that the size of a plume is stable or decreasing, this may indicate that further source/plume remediation and/or monitoring are necessary.

Plume concentrations must be decreasing or predicted to decrease. Enough monitoring data will be required to perform a trend analysis that reliably shows changes in water quality during seasonal and longer-term climactic changes. If monitoring data does not demonstrate that the concentrations are decreasing or predicted to decrease, this may indicate that further source/plume remediation and/or monitoring are necessary.

For natural attenuation to be proposed as the remedy, concentration trends must not be dependent on the continued operation and maintenance of active remediation or containment systems. Any observed improvements in water quality must be *solely* attributable to natural attenuation uninfluenced by past or ongoing active remediation of the affected aquifer. Statistical methods may be applied to demonstrate trends in water quality if they are not readily apparent from the observed data. Description and justification of statistical methods should be provided.

Standard presentation methods should be used to show spatial and temporal trends of indicator parameters to demonstrate that the ground water plume is attenuating sufficiently to justify site closure. Standard presentation methods may include:

- Figures illustrating the current extent of ground water impacts, in excess of the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard), using posted contaminant concentrations next to each well or point where measured.
- Figures comparing the current limits of contamination with its extent from prior time periods to illustrate plume stability, no migration, and plume retreat.
- Graphs showing current and historic contaminant concentrations and water levels versus time throughout the plume, including the plume boundaries.
- Graphs showing the current and historic contaminant concentrations versus distance in the direction of ground water flow.

**B. Are monitoring data sufficient to characterize temporal variability?**

Sufficient monitoring data should be available to show changes in water quality due to the natural, short-term ground water variability that is typically observed during the hydrologic cycle. If ground water conditions (e.g., depth, gradient, flow path) are expected to change significantly from year to year due to droughts, adjacent pumping, excess recharge or other factors, then more frequent and/or additional monitoring may be necessary. Natural temporal variations in water quality are factored into the evaluation of whether constituent concentrations

are declining or predicted to decline. Decisions are based on long-term trends, not on what may be observed from one sampling event to the next.

Monitoring is also necessary to evaluate potential increases (i.e., rebound) in contaminant concentrations following the discontinuation of active remediation methods. To fully evaluate post-remediation rebound, monitoring data should compare baseline (pre-treatment) conditions with conditions during implementation of the remedy (e.g., performance monitoring data) and following completion (e.g., verification monitoring data). The objectives of verification monitoring are two-fold 1) demonstrate a return to natural/equilibrium conditions, and 2) demonstrate that concentrations have stabilized and that rebound will not occur.

The monitoring data should be sufficient to be used as the basis for prediction of the time for attenuation of the plume to levels that meet ground water standards. If data are not sufficient, then additional monitoring will be required.

Although this guidance does not specify the minimum number of years for data collection after active treatment has ceased, a conditional closure request under this guidance will require, at a minimum, several years of sampling data to demonstrate that natural attenuation is a viable remedial alternative.

### **C. Are there natural attenuation processes at work?**

Natural attenuation processes may be demonstrated to be occurring at the site. Natural attenuation processes may include: sorption, biodegradation, chemical reactions with subsurface materials, diffusion, dispersion, and volatilization. This demonstration should include an initial period of monitoring to validate that natural attenuation is occurring, establish the mechanisms and gather sufficient data to support this line of evidence. This would include:

- Spatial and temporal trends in contaminant concentrations to demonstrate evidence of plume attenuation. Contaminants of concern must include all breakdown products generated during plume degradation.
- Spatial and temporal trends of hydrogeologic, geochemical and/or biological parameters to indirectly demonstrate the types of natural attenuation processes and the rate at which such processes will reduce contaminant concentrations. Biogeochemical parameters (e.g., dissolved oxygen, pH, electron acceptors, microbial populations, etc.) provide important evidence to show the potential for biodegradation throughout the plume. Indicator parameters should be evaluated and the meaning of their occurrence and distribution should be explained.
- Data from field or microcosm studies which directly demonstrate the occurrence of a particular natural attenuation process at the site.
- Results of fate and transport modeling. The model selected must be capable of simulating the movement and degradation of contaminants in the aquifer over time and distance, taking into account attenuation mechanisms including biological, physical, and chemical

processes. The model should be appropriate for the site conditions, peer-reviewed and widely accepted.

- Perform compound specific isotope analysis on dissolved organic contaminants to learn more about the processes that are responsible for decreasing contaminant concentrations. When organic contaminants are degraded in the environment, the ratio of stable isotopes will often change, and the extent of degradation can be recognized and predicted from the change in the ratio of stable isotopes. Stable isotope analyses can provide an in-depth understanding of biodegradation or abiotic transformation processes in contaminated aquifers.

**D. When will the division consider conditionally closing a stable plume?**

The division's preference will be for the implementation of remedial actions that result in measurable improvements in ground water quality, with contaminants naturally attenuating as demonstrated with declining concentration trends. However, there may be circumstances where a stable plume, neither shrinking nor increasing, at concentrations above the Colorado ground water standard might also be protective of human health and the environment and therefore eligible for conditional closure. Site conditions that might warrant conditional closure with a stable plume include one or more of the following:

- There are no private or public ground water production wells in close proximity to the site in question.
- Existing ground water quality is not suitable for use, including domestic or agricultural uses, because of naturally occurring constituents (e.g., high total dissolved solids).
- The contaminated aquifer is not capable of yielding a sufficient and sustainable quantity of water for domestic or agricultural purposes (e.g., less than 1 gallon per minute).
- Hydrogeologic conditions are such that the contamination is of limited extent and relatively isolated from other nearby water-bearing formations (e.g., a perched aquifer or water confined to a closed basin such as a depression on a relatively impermeable bedrock surface).
- The contaminant plume is of limited areal extent and confined to the facility property boundary and institutional controls are used to limit access to this contamination.
- Site-specific documentation is provided demonstrating that the constituent concentrations are naturally attenuating at a very slow rate (e.g., an asymptotic decline in concentrations).
- The division establishes an alternate concentration limit under §264.96 of the Colorado Hazardous Waste Regulations that is higher than the Colorado ground water standards.

- The Water Quality Control Commission establishes a site-specific ground water standard for an aquifer.
- Other factors deemed appropriate on a site-specific basis.

Any written proposal for the conditional closure of a site with a stable ground water plume must include adequate information to justify approval of such a request.

**LINE OF EVIDENCE 5: DEFINITION OF THE TIMEFRAME FOR ACHIEVING REMEDIATION GOALS**

*(This section describes how Policy Condition 4 can be satisfied)*

Once it has been demonstrated that the contaminants are attenuating throughout the plume and/or the plume is stable, the predicted timeframe to achieve Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard) must be evaluated. The interpretation of reasonable period of time will differ for each site, based on threat to receptors and existing and future land use. The timeframe should also be evaluated in the context of the future ground water use, and if contamination is likely to adversely affect the use at that time. Making predictions as to the rate of cleanup and potential future uses of ground water will require a thorough review and understanding of all site-specific data, knowledge of future area-wide plans for development established by local governmental agencies and the application of best professional judgment. Long-term monitoring of the natural attenuation may be necessary to estimate a time for cleanup before a request for conditional closure is submitted.

Defining a reasonable timeframe is a complex and site-specific determination that does not permit establishing a generic time period that would be applied at all sites or facilities. Factors that should be considered when evaluating the length of time appropriate for achieving remediation goals in situations where no immediate risk to human health and the environment exists include:

- Residual contaminant concentrations in ground water and the rate of natural attenuation.
- Proximity of contamination to any receptors, but particularly sensitive receptors and threatened or endangered species or habitats (exposure pathways, complete and partial pathways).
- Classification of the affected resource (e.g., drinking water source, agricultural water source) and value of the resource.
- Current and potential use of the aquifer, including proximity to private, public, and irrigation water supplies.
- Geologic and hydrogeologic conditions, including whether the ground water is shallow, perched or otherwise isolated.

- Presence of abandoned wells or other potential vertical migration routes in proximity to the site.
- Magnitude, mobility and toxicity of the contamination.
- Uncertainties regarding the mass of contaminants in the subsurface and predictive analyses (e.g., travel time for contaminants to reach points of exposure appropriate for the site).
- Public acceptance of the extended time for remediation.
- Background water quality, whether naturally occurring or derived from unknown or unrelated sources.
- Reliable institutional controls are in place that would limit or preclude future use of the affected water resource.

**LINE OF EVIDENCE 6: ABILITY TO ENACT, IMPLEMENT AND MAINTAIN INSTITUTIONAL CONTROLS OVER TIME**

*(This section describes how Policy Condition 10 can be satisfied)*

In 2001, Colorado adopted Senate Bill 01-145 (SB 145), which created a statutory “environmental covenant.” The law was amended in 2008 to add a second mechanism called a “notice of environmental use restrictions” or restrictive notice. This statute specifies that environmental covenants and restrictive notices are required for any environmental remediation project in which the relevant regulatory authority makes a remedial decision on or after July 1, 2001, that would result in either or both of the following:

- Residual contamination at levels that have been determined to be safe for one or more specific uses, but not all uses; or
- Incorporation of an engineered feature or structure that requires monitoring, maintenance, or operation or that will not function as intended if it is disturbed.

SB 01-145 as amended was codified at C.R.S. §§ 25-15-317 – 327.

A request to close a site under this guidance and the associated policy constitutes a new remedial decision, making it subject to the need for an institutional control unless the work has been done under the jurisdiction of the Voluntary Cleanup Program.

Voluntary Cleanup Program approval of a “no action” petition is dependent on the applicant identifying existing and proposed uses that are protective of and do not pose an unacceptable risk to human health or the environment at the site. Failure to comply with the existing and proposed uses identified in the application effectively voids the Voluntary Cleanup Program’s determination that the approved remedy is protective. Property owners may voluntarily choose to

include in their Voluntary Cleanup application a proposal to prepare and file an institutional control as part of the site remedy.

Institutional controls, or in the case of Voluntary Cleanup sites, land use commitments specified in the no action determination application, are required to ensure that remedial decisions are protective of human health and the environment. The statute defines “environmental use restriction” as a prohibition of one or more uses of or activities on a property (e.g., drilling for or pumping ground water), a requirement to perform certain acts (e.g., requirements for system operation and maintenance or periodic monitoring necessary to demonstrate compliance), or both, where these prohibitions or requirements are relied on to protect human health and the environment in the remedial decision for an environmental remediation project.

Institutional controls and land use restrictions must be placed on properties (non-Voluntary Cleanup sites) with ground water contaminant levels exceeding the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard) to restrict the use or handling of contaminated ground water and prohibit activities that may change environmental conditions and cause renewed movement or expansion of the plume or other unacceptable exposure to contamination.

The division expects the party requesting the conditional closure determination to perform the work needed to place the institutional controls on the property. Tasks include, but are not limited to, providing the division with property information such as a survey of the affected area and title information. Local municipalities must be contacted in order to verify that proposed use prohibitions are consistent with local zoning requirements. Stakeholders with interest in the property must be notified of the intent to create an institutional control, and under C.R.S. § 25-15-321(5), the property owner must submit documentation to the division certifying that they have notified those individuals having an interest in the affected property of the institutional controls. These and other responsibilities are outlined in the *Institutional Controls Implementation Guidance*, found on the division’s website.

Owners with ground water plumes that have migrated beyond their property boundary must place institutional controls on all affected properties if they intend to seek a conditional closure determination from the division. This may require adjoining property owners agree to the placement of an institutional control on their property. Alternatively, under C.R.S. § 25-15-320(3)(b)(III), the division, with the assistance of the property owner, may negotiate an agreement with other governmental agencies to enact ordinances to restrict activities in offsite areas. Failure to place effective institutional controls on offsite properties overlying ground water plumes may be grounds for disapproving the request for conditional closure.

The only two exceptions to the requirement of placing institutional controls on affected downgradient properties are for sites to:

- Request an alternate concentration limit where the residual contamination in ground water is determined to not pose a substantial present or potential hazard to human health or the environment (see Appendix A); or

- Request a site-specific classification and standards for ground water as set forth in Water Quality Regulation 41 through a rulemaking with the Water Quality Control Commission.

It is the division's intent to limit the application of alternate concentration limits to sites where a low-threat plume has migrated onto a small number of downgradient properties where the applicant can contact the affected property owners to establish an alternate concentration limit. Sites with contaminant plumes that have migrated onto a substantial number of properties on which many people either live or work are not eligible for closure under this policy. Such sites should seek a site-specific ground water standard as set forth in Water Quality Regulation 41 through the Water Quality Control Commission.

Failure to enact appropriate institutional controls is a basis for denying a request for conditional closure of a site and may prompt the resumption of active remediation. Failure to monitor and comply with the prohibitions and requirements listed in the institutional control may also trigger the need for continued active remediation and/or long-term monitoring to verify that the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard) will be met. If institutional controls are required as a condition of site closure under the policy and guidance, property owners must demonstrate to the division that the proposed controls are robust, durable, and maintainable over time. Failure to do so could result in revocation of the conditional closure determination and cause the site to be reopened, including a resumption of ground water monitoring, treatment and/or other remedial activities deemed necessary.

If, at some later date, data are collected that demonstrate attainment of the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard), the property owner may choose to petition the division to remove the institutional controls placed on the site. To process such a request, the property owner needs to submit enough information to support their request for modifying or removing the institutional control.

## **PUBLIC INVOLVEMENT**

Prior to formalizing a conditional closure decision with institutional controls, the entity requesting the conditional closure must notify all property owners, building tenants and residents within the footprint of the ground water plume. Division staff may choose, based on public interest, to initiate and participate in public meetings to discuss the pending conditional closure decision.

Prior to formalizing a site conditional closure decision with an alternate concentration limit, the public notice and public comment processes defined in Appendix A is required

The division will create a registry for sites where conditional closures have been granted that will be easily accessible on the division's website.

## **DOCUMENTATION**

Any proposal to close a site using the conditional closure process will require adequate documentation summarized in a comprehensive report in which all lines of evidence noted in the

previous sections of this guidance have been satisfactorily supported. The more data that can be provided increases the division's confidence that the residual contamination will pose little to no threat, that ground water quality will continue to improve and the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard) will eventually be achieved.

Data used to make decisions regarding a conditional closure determination (site characterization, source remediation, plume behavior, natural attenuation and reasonable time frame) should be presented within a documented framework, for example, the Unified Federal Policy Quality Assurance Project Plan or EPA Data Quality Objectives. Applicants must demonstrate their remediation objectives have been achieved using data of sufficient quality and quantity.

This documentation will become the basis for the division's determination whether or not the conditional closure request is approved. The division will prepare a final decision document outlining the request for closure, factors considered by the division and determinations made. The final decision document will be maintained in the division's site file and will be used as the basis for maintaining a registry of conditional closure determinations and alternate concentration limits approved by the division.

The division will report all conditional closure determinations to the Water Quality Control Division at the same time the property owner is notified of the determination. The division will also notify the Water Quality Control Commission of all conditional closure determinations in the division's annual report to the Water Quality Control Commission.

#### **OTHER OPTIONS IF A REQUEST FOR CLOSURE IS DENIED**

If all lines of evidence cannot be demonstrated to the satisfaction of the division, site conditions are overly complex, or it is not feasible to clean up the site in a reasonable timeframe, additional active remediation and/or monitoring may be required. The party responsible for the cleanup will be expected to perform one or more of the following:

- Additional site characterization to better identify/define the source areas and associated contamination and/or additional remediation using other remedial alternatives that may be more effective at reducing contaminant concentrations in geologic materials or ground water.
- If it is determined that it is infeasible to reasonably attain cleanup objectives after having taken all actions necessary to remediate the release, the responsible party has the option of continuing to monitor ground water quality on a periodic basis until additional work can be completed to help meet lines of evidence that are difficult to achieve or until the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard) are attained. Site-specific circumstances may allow for increasing the time interval between sampling events during this long-term monitoring program. In cases where the long-term remedial alternative being considered is monitored natural attenuation, the responsible party must demonstrate that the ground water plume is stable or declining in size and concentration. Since these sites will not be

cleaned up to unrestricted use in the foreseeable future, an institutional control to prevent future exposure to contamination will be required. .

- Request that the Water Quality Control Commission classify the specified area to something other than domestic or agricultural use that would allow the use of a different standard found within Water Quality Regulation 41 for cleanup purposes.
- Seek a site-specific standard, as set forth in Water Quality Regulation 41, through the Water Quality Control Commission.
- Request that the division approve an alternate concentration limit for a specified area. The division would consider such a request in situations where the only requirement of the conditional closure policy and guidance that cannot be satisfied is the need for obtaining an institutional control for contamination that has migrated off-site. See Appendix A for more details on the alternate concentration limit application process.

## GLOSSARY

### **Active Remediation**

Remedial techniques that rely on active measures to either treat or isolate contaminated soil or ground water in an effort to control or clean it up over an extended period of time. These in situ and ex situ techniques traditionally involve pumping out, injecting into, treating in situ or isolating the ground water. Such technologies include, but are not limited to, the following examples: pump-and-treat, passive and active non-aqueous phase liquid (NAPL) skimming, air sparging, dual-phase extraction, vacuum-enhanced non-aqueous phase liquid and ground water recovery, any in situ treatment technique that requires the periodic addition of treatment agents or nutrients to aid in the destruction of chemical contaminants and containment barriers, regardless of whether they are created hydraulically or with physical barriers, such as slurry walls or sheet pile curtains.

### **Colorado Ground Water Standard**

Colorado ground water standards as listed in "The Basic Standards for Ground Water," Water Quality Regulation 41 (5 C.C.R. 1002-41).

### **Conceptual Site Model**

A three-dimensional representation of the ground water flow and solute transport system over time. The model conveys what is known or suspected about contamination sources, release mechanisms, and the fate and transport of the contamination and includes the site's biochemical and geochemical conditions. It explains where contaminants are in the environment and the potential threats that these contaminants pose to human and ecological health, water resources, and the environment. The conceptual site model is used to assess risks and threats to human and ecological receptors and water resources. It should take into consideration historic, current and future conditions. The conceptual model is typically conveyed through written descriptions and is supported by maps, hydrogeologic cross-sections, tables, diagrams and other illustrations. A conceptual model is not synonymous with "computer model" or "simulation model"; however a computer or simulation model may be helpful for validating historic observations, for understanding and visualizing current site conditions or for predicting future conditions. The conceptual site model should constantly be evaluated during the site characterization process for data needs and consistency. It is important to collect field data to test the conceptual model, and not "force-fit" site data into a preconceived, and possibly inaccurate, conceptual representation.

### **Health-Based Remediation Goals**

Constituent concentrations in a contaminated media that are protective of human health based on a specified land use scenario and set of exposure assumptions. For known or suspected carcinogens, the remediation goal should typically be set at concentrations that represent an excess upper bound lifetime risk to an individual of  $1 \times 10^{-6}$ . For sites with multiple contaminants, the remediation goal is generally set so that the risk posed by individual constituents does not exceed a  $1 \times 10^{-6}$  and where the cumulative (total) excess upper bound lifetime risk from all contaminants does not exceed a  $1 \times 10^{-5}$ . Site-specific conditions may allow for the use of cleanup goals protective of human health that result in the total residual risk from any medium to an individual exposed over a lifetime falling within a range from  $10^{-4}$  to  $10^{-6}$ . The rationale for the risk level selected will be documented in the official record for the decision. For constituents

associated with adverse effects other than cancer, the remediation goal should be established at concentrations to which human populations, including sensitive subgroups, could be exposed on a daily basis without appreciable risk of negative effect during a lifetime. Such levels are interpreted as being equal to or below a hazard quotient of one. For sites with multiple contaminants or exposure pathways, the remediation goal should result in a cumulative hazard quotient (hazard index) equal to or less than one for all those constituents with similar critical endpoints.

### **Institutional Controls**

Legal restrictions on the use of, or access to, a site to eliminate or minimize potential exposure to residual contamination or to prevent interference with the effectiveness of a response action as provided by C.R.S. §§ 25-15-317 – 327. Environmental covenants, notices of environmental use restriction (also known as restrictive notices) and local ordinances enforceable by the division through an intergovernmental agreement are institutional control mechanisms available under this statute.

### **Low-Threat Closure**

Low-threat closure is based on the understanding that cleanup standards can be met under natural conditions within a reasonable timeframe, once adequate source control and plume remediation are complete and considering site-specific conditions, the future land use, and the likelihood of and timeframe for actual beneficial use of the affected water resources. There is a high degree of confidence that contaminant toxicity, recalcitrance and mobility, and the uncertainty associated with site characterization and remediation, will not yield situations in the future that would endanger human health, surface water quality, and potentially usable ground water resources.

### **Natural Attenuation**

The unenhanced natural processes that cause a reduction in mass or concentration of contaminants in ground water over time or distance from the point of release. The natural processes that are at work in such a remediation approach include a variety of physical, chemical or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil or ground water. These in-situ processes include biodegradation, dispersion, dilution, sorption, volatilization, radioactive decay, and chemical or biological stabilization, transformation or destruction of contaminants.

### **Owner**

The person or party who owns a facility or part of a facility on which a release has occurred and is now subject to remediation.

### **Plume**

In ground water, a plume is an underground area of contaminant concentrations created by the movement of ground water beneath or through a contaminant source. Contaminants primarily spread in the direction of ground water movement and to a lesser degree laterally via diffusion and mixing. The highest concentrations are typically found near the source of the release, with concentrations generally decreasing as you move away from the source. The plume boundary, or footprint, is defined as the extent of contamination in ground water in all dimensions with

concentrations in excess of the Colorado ground water standards (or other division approved remediation goals in the absence of a ground water standard).

### **Primary Source Area**

Waste material and highly contaminated environmental media found in and immediately adjacent to the release point. It includes the following: activities that caused the release of waste and associated contamination into the environment, such as leaking tanks, leaking process equipment and the unintentional or intentional disposal of product or waste materials; all solid or hazardous waste that may have been discharged, deposited, injected, dumped, spilled, leaked or placed into or on the land or water; free phase contamination; soil that exhibits the hazardous waste characteristics of ignitability, corrosivity, reactivity, or toxicity as defined in 6 CCR 1007-3 Part 261 Subpart C; high concentrations of dissolved phase ground water contamination that by itself will be capable of continuing to act as a source to further degrade ground water quality if not remediated; high concentrations of contaminants sorbed to formation materials that by itself will be capable of continuing to act as a source to further degrade ground water quality.

### **Residual Contamination**

Contamination that remains after an environmental cleanup was completed and approved.

### **Responsible Party**

The person or party who either was responsible for causing the release of contamination to the environment or who has either chosen or is required to take responsibility for remediating the release of contamination under division oversight.

### **Secondary Source Area**

Environmental media, typically fine grained soil and fractured rock, located outside the primary source area that are also capable of degrading ground water quality for an extended period of time as a result of the retention and slow release of contaminants.

### **Sensitive Receptors**

Sensitive receptors are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. They include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. Extra care must be taken when dealing with contaminants and pollutants in close proximity to areas recognized as sensitive receptors.

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## APPENDIX A

### Alternate Concentration Limits

Only sites and facilities regulated by the Colorado Hazardous Waste Regulations (6 CCR 1007-3) are eligible to be considered for alternate concentration limits.

Section 264.94(b) of the Colorado Hazardous Waste Regulations states, in part:

“The Director will establish an alternate concentration limit for a hazardous constituent if he/she finds that the constituent will not pose a substantial present or potential hazard to human health or the environment as long as the alternate concentration limit is not exceeded.”

Under Section 264.94(b), the Director of the Hazardous Materials and Waste Management Division (the division) has the discretion to establish site-specific ground water contaminant limits using a process that considers a variety of potential adverse effects on ground water quality when deciding whether to grant an alternate concentration limit, including such things as:

- The physical and chemical characteristics of the hazardous waste constituents, including their potential for migration;
- Local hydrogeological characteristics;
- The proximity of ground water users; and
- The potential for health risks caused by human exposure and damage to wildlife, crops and vegetation.

Once an alternate concentration limit is established, the division expects it will not be exceeded. The division will have concluded that the residual contamination in ground water will not pose an unacceptable present or potential hazard to human health or the environment.

The process for establishing an alternate concentration limit will be as follows:

1. A site owner/operator wishing to close their facility or site with an alternate concentration limit provides written documentation that: a) demonstrates that they have satisfied all criteria listed in the division's *Policy for Conditional Closure of Low-Threat Sites With Residual Ground Water Contamination*, with the exception of requiring an environmental covenant, and b) demonstrates that site-specific conditions would allow leaving residual contamination in ground water that continues to be protective of human health and the environment based on the factors listed in Section 264.94(b).
2. The information provided by the site owner/operator is reviewed by the division to determine whether all required information has been received and that it is adequate for the purpose of justifying an alternate concentration limit. The division provides written notification to the party seeking an alternate concentration limit that a) the information received is adequate and that the division will commence the alternate concentration limit

setting process, b) the information received was deficient, identifying what additional information is necessary to support an alternate concentration limit determination or c) the establishment of an alternate concentration limit is unsupported by the information received and that the division cannot proceed any further on the issue.

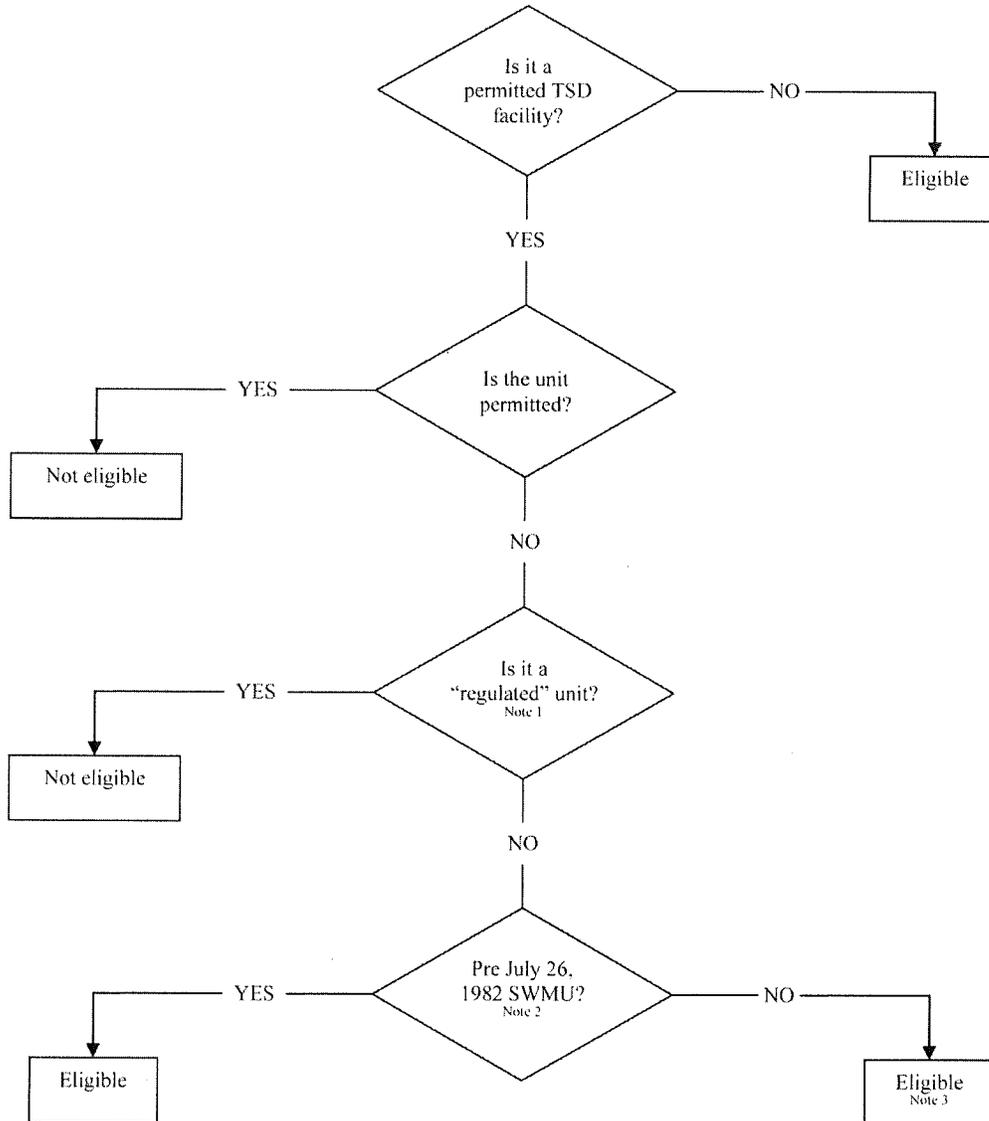
3. Alternatively, division staff may determine that an alternate concentration limit is appropriate at a certain facility or site.
4. Whether proposed by a site owner/operator or by division staff, the division will prepare an "Alternate Concentration Limit Packet" if the decision has been made to proceed with the limit setting process. The Alternate Concentration Limit Packet will include:
  - A. The proposed alternate concentration limit(s);
  - B. The area(s) in which the alternate concentration limits are proposed to apply;
  - C. All information used to justify that the conditions in the *Policy for Conditional Closure of Low Threat Sites with Residual Ground Water Contamination* have been met; and
  - D. All information used to justify that the conditions in Section 264.94(b) of the Colorado Hazardous Waste Regulations have been met.
5. Prior to approving any alternate concentration limits, the following public notice and public comment processes will be completed by the division:
  - A. A notice of the proposed alternate concentration limits and the area in which they are proposed to apply to will be sent to:
    1. All persons on the facility mailing list;
    2. All owners of property affected by and adjacent to the area in which the alternate concentration limits are proposed to apply;
    3. The Water Quality Control Division; and
    4. The appropriate local government entity or local governing body.
  - B. In addition, the division will ensure timely publication of this notice in a major local newspaper of general circulation. This notice must include:
    1. The proposed alternate concentration limits and the area in which they are proposed to apply;
    2. Announcement of a 60-day public comment period;
    3. The name, mailing address, email address, and telephone number of the division contact to whom comments must be sent; and
    4. The location where copies of the alternate concentration limits and the area in which they are proposed to apply, along with the Alternate Concentration Limit Packet, can be viewed and copied in accordance with paragraph C below.
  - C. The division will place a copy of the alternate concentration limits and the area in which they are proposed to apply, along with the Alternate Concentration Limit Packet, in a location accessible to the public in the vicinity of the facility or site where the alternate concentration limits are proposed to be applied.

- D. The division may hold a public meeting on the alternate concentration limits and the area in which they are proposed to apply, if such a meeting is requested in a timely manner by any party. To be timely, the public must request the meeting no later than 15 days prior to the close of the comment period. If a public meeting is convened, the following applies:
1. The meeting must be held, to the extent practicable, in the vicinity of the facility or site where the alternate concentration limits are proposed to be applied;
  2. The meeting must occur no earlier than 15 days after the publication of the notice required in paragraph B above and, if possible, should occur on or before the close of the 60-day comment period; and
  3. Notice of the meeting must be sent to all the parties listed in paragraph A above no later than 7 days prior to the scheduled meeting date.
- E. The public shall be provided a minimum of 60 days to comment on the alternate concentration limit proposal. The comment period will begin on the date the division publishes the notice in the local newspaper. Comments must be submitted to the division contact identified in the public notice. At the division's discretion, the public comment period can be extended up to 15 calendar days.
- F. After the close of public comment, division staff will prepare a written response to all public comments received. The response to comments will be sent to every commenter and will be attached to the final alternate concentration limit decision document.
6. After taking into consideration all comments received, the division must in writing: approve and finalize the alternate concentration limit request, with or without changes, or deny the request or proposal.
  7. If approved, the facility or site will be recorded in a registry of sites where alternate concentration limits have been granted, similar to the division's registry of environmental covenants and restrictive notices. Information in this registry will include the numeric values of the alternate concentration limits, a description of the geographic and hydrographic limits of the alternate concentration limits and a summary of the Alternative Concentration Limit Packet.

It is the division's intent to limit establishing alternate concentration limits to sites where a low-threat plume has migrated onto a small number of downgradient properties where the applicant can contact the affected property owners to establish an alternate concentration limit. Sites with contaminant plumes that have migrated onto a substantial number of properties on which many people either live or work are not eligible for closure under this policy. Such sites should seek a site-specific ground water standard as set forth in Water Quality Regulation 41 through the Water Quality Control Commission.

## Appendix B

### RCRA Facility Conditional Closure Eligibility Determination



Note 1: A surface impoundment, waste pile, land treatment unit or landfill that was in existence on November 19, 1980 and qualified for interim status, that certified closure before January 26, 1983, or that received waste after July 26, 1982 but for which a permit has not yet been issued.

Note 2: Any area or discernible unit that was used to manage, store or dispose of solid waste prior to July 26, 1982, regardless of whether that waste would be considered hazardous and that must only comply with the requirements of § 264.101, as per § 264.90(a)(2).

Note 3: Eligible only if the solid or hazardous waste that is acting as a ground water contamination source will be removed from the site via waste removal or remediation. For example, a contaminated site resulting from the release of hazardous waste that triggers a process that will result in its cleanup, such as a punctured drum, leaking tank, leaking pipeline, leaking process equipment, i.e., sites where the disposal was either not known to be occurring or unintentional are eligible for consideration.