

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Solid and Hazardous Waste Commission

Hazardous Materials and Waste Management Division

6 CCR 1007-2

STATEMENT OF BASIS AND PURPOSE AND SPECIFIC STATUTORY AUTHORITY FOR

Revision to Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part 1) –Deletion and Replacement of Existing Section 5.5 Regulations (Management of Asbestos-Contaminated Soil) with New Section 5.5 Regulations (Management of Regulated Asbestos Contaminated Soil (RACS)); the Addition of Appendix 5A (Sample Collection Protocols and Analytical Methodologies) and the Associated Additions and Revisions to Section 1.2 Definitions

Basis and Purpose

I. Statutory Authority

These proposed modifications are made pursuant to the authority granted to the Solid and Hazardous Waste Commission in Section 30-20-109 C.R.S.

The specific authority for these rules is provided in Section 30-20-109, C.R.S. (“The solid and hazardous waste commission shall promulgate rules and regulations for the engineering design and operation of solid waste disposal sites and facilities . . .”); and Section 25-15-302(4.5), C.R.S. (“the commission shall adopt rules concerning solid waste disposal sites and facilities in accordance with part 1 of article 20 of title 30, C.R.S.

Section 5.5 of the Regulations Pertaining to Solid Waste Sites and Facilities, 6 CCR 1007-2, Part 1 (Solid Waste Regulations)- applies to solid waste disposal sites and facilities where soil disturbing activities encounter: 1) debris as defined in Section 1.2 of the Solid Waste Regulations or 2) the soil or ash is known to contain asbestos fibers, through documented evidence apply to all existing or new solid waste facilities and disposal sites. Section 30-20-101, C.R.S. defines solid waste as “any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial or commercial operations or from community activities.” Solid waste disposal is defined as “the storage, treatment, utilization, processing, or final disposal of solid wastes” and solid waste disposal site and facility is defined as “the location and facility at which the deposit and the final treatment of solid wastes occur.” The proposed new definition of “debris” is a subset of solid waste subject to the Solid Waste Regulations, and properties where debris is present are solid waste disposal sites. Asbestos containing material (ACM)¹ that has been discarded or disposed is debris, and is specifically defined in the Solid Waste Regulations as asbestos waste, meaning “any asbestos-containing material whether it contains friable or non-friable asbestos, that is not intended for

¹ Asbestos Containing Material (ACM) is an existing term defined in Federal regulation (40 CFR 61 Subpart M) and State regulation (5 CCR 1001-10, Part B, and Section 1.2 of the Solid Waste Regulations 6 CCR 1007-2, Part 1).

further use.” Therefore, all debris, including all ACM debris, is subject to the broad requirements of the Solid Waste Regulations. Section 5.5 establishes additional requirements that apply only to the subset of solid waste that includes asbestos or ACM debris in soil, defined as ACS.

The State Board of Health² promulgated a revision to Section 5 of the Solid Waste Regulations in 2006 in order to address asbestos contamination in the soil. The Air Quality Control Commission has promulgated Regulation No. 8, The Control of Hazardous Air Pollutants, Part B, The Control of Asbestos (Regulation No. 8), in order to protect public health and the environment during asbestos abatement and control projects dealing with facility components. Regulation No. 8 deals with Asbestos Containing Material (ACM) which is defined as containing greater than 1% asbestos. One of the reasons for the promulgation of the revision to Section 5 of the Solid Waste Regulations was to address sites that were contaminated with asbestos at levels that are less than 1% asbestos, and where the asbestos contamination is not related to the presence of a facility component, and thus not specifically regulated under Regulation No. 8.

In 2004, the Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) issued a directive stating that disturbance of materials that contain less than one percent asbestos can result in concentrations of airborne asbestos above acceptable exposure criteria. The OSWER directive clarified that the 1% threshold for ACM is not health based. Rather the 1% threshold was established in the 1973 National Emissions Standards for Hazardous Air Pollutants (NESHAPS), where the intent of the threshold was to ban the use of materials that contain significant quantities of asbestos, but to allow the use of materials with small quantities of asbestos (less than 1%) used to enhance the materials effectiveness. All subsequent EPA regulations included the 1% threshold, and the 1990 NESHAP revisions retained the 1% threshold stating that it was related to the detection limits of the phase contrast microscopy (PCM) analytical method. The OSWER directive recommends that EPA Regions develop risk-based, site-specific action levels to determine if EPA response actions are necessary when materials with less than 1% asbestos are found at a site. The OSWER directive is supported by research conducted by EPA and others, which demonstrates that high airborne fiber concentrations can be generated during disturbance of soil/debris with less than 1% asbestos, even with 0.001% asbestos.

Section 5.5 of the Solid Waste Regulations (Section 5.5) and Regulation No. 8 were drafted for different applications, and therefore require different approaches to successfully mitigate asbestos hazards and protect human health and the environment. Regulation No. 8 addresses removal of ACM on facility components where the concentration of asbestos is greater than 1% of the material in question. Abatement conducted under Regulation No. 8 involves the disturbance of ACM within a negative pressure containment and utilizes air monitoring to “clear” this containment prior to re-occupancy by the public. When developing Section 5.5 the Division evaluated the OSWER directive and research which demonstrated that a health-based threshold for asbestos in soil cannot be established without conducting a site-specific risk assessment. Therefore, Section 5.5 addresses the management of asbestos contamination independent of concentration, and establishes a risk management approach aimed at limiting the potential for airborne exposure through engineering controls. Management of asbestos-contaminated soil conducted under Section 5.5 involves disturbance of asbestos in an outdoor open air environment without containment. Air monitoring is used in Section 5.5 to verify the

² The Board of Health previously had authority to promulgate rules for solid waste disposal sites and facilities. This authority was transferred to the Solid and Hazardous Waste Commission in July of 2006.

effectiveness of the engineering controls being employed at the site during soil disturbing activities. In contrast, air monitoring is utilized in Reg. 8 to determine clearance of a containment, for the purposes of re-occupancy.

Regulation No. 8 allows some types of ACM to remain in a building during demolition. Any debris that is not removed from a site after demolition is solid waste subject to the Solid Waste Regulations, including Section 5.5, for any remaining ACM and/or soil impacted by asbestos. However, if the ACM or soil contaminated by asbestos is determined to be the result of an improper demolition, the regulatory authority would remain with the Air Pollution Control Division (APCD) as a spill response to be conducted under Regulation No. 8. Alternatively, when asbestos is present at a site without readily identifiable facility components and no improper demolition can be ascertained, which is often the case with historic disposal locations, the management of asbestos is conducted under Section 5.5.

There may be situations where abatement of a facility component subject to Regulation No. 8 is collocated in an area of asbestos contaminated soil (not associated with a facility component) subject to Section 5.5. In these instances, both Regulations could apply concurrently or individually.

II. Purpose of revising the regulations

The primary purpose of Section 5.5, and its associated definitions, is to prevent exposure to asbestos fibers resulting from disturbance of asbestos-contaminated soils (ACS). The purpose of the Section 5.5 revision is to update the ACS regulations based on the Hazardous Material and Waste Management Division's (the Division's) and stakeholders' experience gained from implementing the regulation since its promulgation in 2006. Consistent with the initial regulatory process, the Division confirmed: 1) the risk associated with ACS is from the inhalation of airborne fibers, and 2) it is virtually impossible to correlate the concentration of asbestos in the soil with the measured concentration of asbestos fibers in air. In addition, the Division and stakeholders learned that it is virtually impossible to control every fiber all the time to completely eliminate potential exposures. However, practical and implementable engineering controls can be, if applied properly, effective in controlling the release of asbestos fibers. Therefore, the proposed revisions to Section 5.5 and the associated definitions are aimed at improving the management of ACS, while maintaining protectiveness of human health and the environment.

The Division and stakeholders have learned several lessons through the implementation of Section 5.5. Key among the lessons learned is that the engineering controls used by owners and operators can be effective at controlling potential asbestos emissions generated by soil disturbing activities at sites with ACS. Since the primary risk associated with asbestos is from the inhalation of asbestos fibers, then engineering controls that successfully control or eliminate emissions of those fibers will protect human health and the environment. This information led to the development of a best management practices (BMP) approach to managing sites with ACS. The resulting BMPs established the minimum requirements necessary for proper management of asbestos-contaminated soil; therefore, the Division and the majority of stakeholders agreed that the BMPs should become minimum requirements under Section 5.5. The minimum requirements: 1) eliminate the requirement for a work plan to be submitted by providing an immediately implementable work plan; 2) eliminate the time and cost associated with Division review of work plans; 3) expedite project implementation; and 4) provide a predictable framework for developing and implementing site specific work plans.

Discussion of Regulatory Proposal

I. New and Modified Definitions

The proposed Section 5.5 regulations require new definitions and the modification of some existing definitions. These changes summarized below will be incorporated into Section 1.2 of the Solid Waste Regulations (6 CCR 1007-2, Part 1).

The following definitions are being added to Section 1.2:

1. Adjacent Receptor Zone
2. Air Monitoring Specialist (AMS)
3. Ancillary Worker
4. Area of Contamination
5. Certified Asbestos Building Inspector (CABI)
6. Debris
7. Friable asbestos-containing material
8. Non-Regulated Asbestos Contaminated Soil (Non-RACS)
9. Project
10. Qualified Project Monitor (QPM)
11. Regulated Asbestos Contaminated Soil (RACS)
12. Regulated Work Area (RWA)
13. Staging
14. Stockpiling
15. Storage
16. Visible

The following definitions are being modified in Section 1.2: (pending verification with state statutory and federal subtitle D definitions)

1. Adequately wet
2. Asbestos
3. Asbestos-containing Material (ACM)
4. Asbestos-contaminated Soil (deleted and replaced with RACS)
5. Mechanical
6. Soil-disturbing activities
7. Visible emissions

II. Scope and Applicability

Although the proposed regulations were drafted using the framework and construct of the original regulations, there are significant changes to the scope of Section 5.5 and to management options used at sites with ACS. Section 5.5 currently applies to owners or operators of properties where ACS is disturbed; where ACS is defined as soil containing any amount of asbestos, and the trigger into the regulation is knowledge, or reason to know/believe, of ACS to be disturbed. The proposed revisions to Section 5.5 replace ACS with RACS³; where RACS is determined

³ The term “asbestos-contaminated soil” (ACS) in the current regulation has been replaced with the term “regulated asbestos contaminated soil” (RACS) in the revisions to Section 5.5. Therefore, in this Statement of Basis

based on the propensity for ACM to release asbestos fibers. Further, the proposed revisions to Section 5.5 remove the “reason to know/believe” trigger, and replace it with a requirement that a person who disturbs debris make a RACS determination.

The proposed revisions to Section 5.5 retain the standard operating procedures (SOPs) and pre-approved work plan options, and establish new minimum requirements (Section 5.5.7) that can be implemented in lieu of a work plan or SOP, thus eliminating the need for plan submittal. If owners or operators wish to propose work practices that deviate from the minimum requirements set forth in Section 5.5.7, they may submit the proposed work practices in a work plan or SOP for Division consideration. Alternatively, a waiver from one or more of the requirements set forth in Section 5.5 may be requested following the Waiver Process and Procedures set forth in Section 1.5 of the regulations.

The revisions to Section 5.5 retain the current exemptions for: 1) asbestos abatement conducted under Regulation No. 8; 2) spill response conducted under Regulation No. 8; 3) ambient occurrences of asbestos (i.e., background); 4) de minimum projects involving less than 1 cubic yard of RACS disturbance using low emissions methods; and 5) projects conducted by a home owner on their primary residence. An exemption for Non-RACS has been added to Section 5.5, for ACM that does not have the propensity to release asbestos fibers; however, Non-RACS must be disposed as non-friable asbestos waste, in accordance with Section 5.2, and must be addressed during a remediation project where the owner/operator is seeking a No Further Action or No Action Determination.

Stakeholder Involvement in the Process

The Division is proposing to revise the regulations (Section 5.5) and the definitions associated with soil disturbing activities at sites with RACS. The initial stakeholder meeting was held on October 5, 2011. The stakeholders were provided a draft of the proposed regulations prior to the meeting. The Division determined that the stakeholders had numerous issues with the existing and proposed regulations. Further, the Division determined that the stakeholders would be best served by developing three stakeholder groups: 1) general stakeholder, 2) best management practices and 3) a risk evaluation. This approach afforded the opportunity for select stakeholders with special interests and/or specialized experience to participate in the appropriate group(s). This approach facilitated the independent work of the BMP group and the risk evaluation group. Another benefit of this approach was to work and report on issues concurrently thereby saving time and stakeholder fatigue. The following describes the Division’s effort to work with and reach out to stakeholders.

I. Extent of Agency Consultation with owners, operators, consultants, and Local Government Representatives

The Division utilized various methods to inform individual industry representatives, industry trade associations, local government agencies, and local government agency associations of the proposed regulatory revisions. These methods included:

1. Posting a Stakeholder Process Notification Request Form on the Division’s website to notify stakeholders of upcoming stakeholder meetings and related draft documents.

2. Providing industry representatives and local government representatives information regarding stakeholder meetings and providing all draft documents and discussion materials by e-mail.
3. All registered known owners, operators, consultants and interested parties were notified by email prior to the release of the first draft of the revisions to the regulations.
4. The Division sent out stakeholder meeting email notices that included the latest draft revisions to regulations and the Statement of Basis and Purpose. The emails were sent directly to local county governments and industry representatives, and also to the following organizations for distribution: Colorado Counties, Inc. (CCI), Colorado Municipal League (CML), and Colorado SWANA (CO SWANA). All of these organizations report to local government constituents and industry representatives involved in matters pertaining to solid waste.
4. The Division hosted 33 general, 9 BMP and 10 risk evaluation stakeholder meetings during the twenty-two month drafting process from October 2011 to July 2013. Stakeholders frequently submitted questions to the Division about the revisions throughout the process. The questions received by the Division were addressed in subsequent stakeholder meetings to share with the group, and also directly to the stakeholder proposing the question by email, or phone conversation. Key stakeholder questions and/or issues are compiled and discussed under the following section of this document. Work group meetings were held to discuss specific topics such as the development and evaluation of BMP and the risk evaluation process. The Division used teleconferencing so absent or distant stakeholders could participate. Additionally, the Division's website was utilized to post updates to the regulation revision process, stakeholder comments, iterative versions of support and working documents, and audio recordings of general stakeholder meetings.

II. Issues Encountered During the Stakeholder Process

The stakeholders identified numerous issues associated with the implementation of the existing Section 5.5 regulations. The following concerns and questions were raised by the stakeholder during regulatory revision and drafting process.

1. Stakeholders expressed concerns that the Division's inspectors regulated via fiat (i.e., Executive Order) through guidance instead of the explicit regulatory requirements. This issue was discussed at length with the stakeholders. The Division explained that solid waste sites and facilities have a great deal of variability. The solid waste regulations contain a significant amount of flexibility to accommodate site specific variability and unique circumstances. However, the stakeholders indicated a preference for increased regulatory specificity.

The Division explained that increased regulatory specificity would result in decreased regulatory flexibility. Further, the Division emphasized that one of the primary reasons the Regulations were successful was because of their flexibility to accommodate a wide variety of sites and circumstances. Regardless, the stakeholders wanted more regulatory specificity. Therefore, the Division sought to eliminate vague regulatory language, thus

the proposed regulations contain minimum requirements that apply to all sites where RACS is disturbed.

2. The stakeholders indicated that the increased cost of implementation was disproportionate to the increased level of protection for human health and the environment. There were significant discussions regarding the cost of implementing the existing regulation compared to excavation projects conducted prior to passage of the existing Section 5.5 regulations and associated definitions. The Division clearly indicated that cost comparisons would be based on the costs associated with implementing the existing regulations compared to the proposed regulations, and not the proposed or existing regulations compared to the absence of regulations. There were also significant discussions about the opportunities to save money based upon experience gained from implementing the regulations over the last six years. Stakeholders brought forward three examples of costs incurred through implementation of the existing Section 5.5 regulations: 1) disposal, 2) oversight, and 3) air monitoring.

The primary source of increased costs associated with disposal under Section 5.5 activities are: 1) the cost of water to ensure that the ACS is “adequately wet”, 2) the disposal cost caused by the increased water weight, 3) the cost of plastic liners used as leak tight containers, 4) disposal as ACS instead of construction demolition debris or contaminated soil, and 5) the cost of transport and disposal of ACS with visible friable ACM, due to the limited number of landfills permitted to accept friable asbestos. The Division and stakeholders both learned much about water application during the last five years. The definition of adequately wet in the current regulation states:

“Adequately wet” means sufficiently mix or penetrate with liquid to completely prevent the release of particulate material and fibers into the ambient air. If visible emissions are observed coming from asbestos-contaminated soil or asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.

Implementation of this definition successfully controls the release of asbestos fibers from ACS. However, soil was sometimes being wetted to the point of becoming a slurry. In some circumstances much more water was being applied than required to control asbestos fiber emissions. This over-wetting had several negative unintended consequences: 1) liners wrapping the soil ruptured upon disposal at the landfill, 2) operational difficulties at the landfills, and 3) an increase of the landfill disposal fee.

The Division is proposing a revised “adequately wet” definition to address overwatering issues while still preventing or controlling asbestos fiber emissions:

“Adequately wet” means sufficiently wet to minimize or eliminate visible emissions of dust and/or debris within the Regulated Work Area (RWA) and prevent the release of visible emissions from leaving the RWA in accordance with Section 5.5 of these Regulations. The observance of visible emissions, outside of the RWA, of dust and/or debris is an indication that soils are not adequately.

Application of the revised definition of “adequately wet” should reduce the amount of water applied to RACS. The associated water application practices should result in: 1) improving the integrity of the liners wrapping soil during landfill disposal activities, 2) reduced landfill operational issues associated with handling and managing slurry-like soil, 3) reduced water purchase fees, and 4) reduced disposal costs from excess water weight.

In addition, the definition uses a “visible emission” standard that can be readily implemented and evaluated during field operations. While the definition is not based on completely preventing all fibers from leaving the RWA, the Division’s experience is that when water (or amended water⁴) is applied appropriately to ACS, visible and non-visible emissions are controlled. Water (or amended water) applied in an appropriate manner controls both visible and non-visible emissions.

3. A few stakeholders expressed concern that the Division was being inconsistent with other State and Federal regulations by requiring management of materials that contain asbestos at concentrations below 1%. However, the definition of “asbestos-containing waste materials” in 40 CFR 61 Subpart M includes “regulated asbestos-containing material wastes and materials contaminated with asbestos.” This definition does not include a threshold of 1% for materials contaminated with asbestos, and therefore applies to materials contaminated with any amount of asbestos. This definition illustrates the fact that Federal regulations include requirements for proper management of materials contaminated with less than 1% asbestos. Additionally, OSHA requires the management of asbestos materials that can generate an airborne concentration above 0.01f/cc (OSHA PEL) regardless of the concentration of asbestos in the material. Therefore, the Division’s requirement to manage materials contaminated with asbestos, even at concentrations below 1%, is consistent with other established regulations.
4. A few stakeholders suggested that the Division should only regulate soil containing friable ACM, and that all non-friable ACM should be exempt from regulation under Section 5.5. However, the Division believes that exempting all non-friable ACM from the management requirements of Section 5.5 would not be protective of public health. Because the risk associated with exposure to asbestos is due to the inhalation of asbestos fibers, it is necessary to manage all asbestos in a manner that minimizes or eliminates the generation of airborne asbestos fibers. The proposed revisions to Section 5.5 would apply only to RACS; where RACS is determined based on the propensity for ACM to release asbestos fibers. This is similar to the requirements for the management of Regulated Asbestos Containing Material (RACM) under NESHAP and Regulation No. 8, which includes requirements for the inspection and proper management of non-friable ACMs that have a high probability to release asbestos fibers. In the proposed revisions the Division has sought to bring the regulations more closely in line with other established regulations, specifically NESHAP and Regulation No. 8, and in doing so has provided some relief by specifically categorizing certain materials that do not have a high propensity to release fibers into the proposed definition of Non-RACS. Materials that fall under the definition of Non-RACS would be exempt from management under the

⁴ Due to the hydrophobic nature of some types of asbestos and associated matrices, it is often necessary to amend water with a surfactant. To address this issue, the revisions to Section 5.5 include a requirement to use amended water when disturbing friable ACM.

proposed revision to Section 5.5, and would only require proper disposal in accordance with the current Section 5.2 of the regulations.

Following is a comparison of materials that are RACM under NESHAP and materials that would be RACS under the proposed Section 5.5:

<u>RACM under NESHAP</u>	<u>RACS under Proposed Section 5.5</u>	<u>Comparisons</u>
<u>1) Friable asbestos material</u> <u>2) Category I non-friable ACM that has become friable</u> <u>3) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading</u> <u>4) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material</u>	<u>Soil, ash, or debris (plus 6 inches in all directions) containing:</u> <u>1) Friable asbestos containing materials</u> <u>2) Asbestos containing materials that have been broken/resized/damaged, and have a high probability of becoming crumbled, pulverized, reduced to powder, or releasing fibers from the forces expected to act upon the material, as determined by a CABI in the field. The following asbestos-containing materials are RACS (included below)</u> <u>3) Soil or ash known to contain non-visible asbestos based on documented evidence</u>	<u>1) Friable asbestos materials or previously non-friable materials that have been rendered friable are regulated under both constructs</u> <u>2) Asbestos containing materials, specifically non-friable materials, that either have already become, or will become damaged, crumbled, broken, and/or rendered friable are regulated under both constructs</u> <u>3) Soil or ash that is known to contain non-visible asbestos based on documented evidence would fall under material contaminated by asbestos and would be considered to be asbestos containing waste material, and thus regulated under the NESHAP although not specifically under the umbrella of RACM. Hence, the Division included these materials in the scope of RACS. This same rationale also applies to the “plus 6 inches” of soil or other matrix that is considered RACS in the opening of the RACS definition.</u>

The definition of RACS parallels the NESHAP and APCD Regulation 8 definitions of Regulated Asbestos containing Material (RACM). RACM and RACS are parallel, and materials that are not RACM will not be RACS. The Definition of RACS includes a list of materials that specifically will be considered RACS in certain instances, if they satisfy the

criteria of the rebuttable presumption. These example materials were included for the purpose of clarification, were inserted based upon stakeholder requests, and were developed with stakeholder input. The Division has added a rebuttable presumption to Section 1.2 in Appendix 1 that clarifies that RACS is limited to non-friable materials that have been broken/resized/damaged, and have a high probability of becoming, crumbled, pulverized, reduced to powder, or releasing fibers from the forces expected to act upon the material, as determined by a CABI in the field. The list of materials that will be considered to be RACS under the proposed revision is as follows:

1. Asbestos cement materials
2. Plaster
3. Brittle caulking, glazing, and sealants
4. Powdery Concrete Masonry Unit (CMU) sealant
5. Powdery floor leveling compound
6. Drywall/wallboard and associated joint compound material
7. Firebrick
8. Deteriorated non-friable materials that are in poor condition due to weathering, mechanical impact, fire damage (by evidence of ACM within and ash layer) or other factors
9. Other material as determined by the Department, at the request of the person disturbing debris, to have a high probability to release fibers

It is important to note that the materials listed above must be broken/damaged/re-sized and have a high probability to release asbestos fibers in order to meet the definition of RACS and therefore be regulated under the proposed Section 5.5. Additionally, all of the above listed materials would fall under the definition of Category II non-friable materials and would be regulated under the NESHAP in one of the two following ways:

- 1) Typically, these specific materials are found in a condition of being broken, damaged, crumbled, resized, or pulverized from forces that have previously impacted the materials (e.g., depositing and/or compacting during their placement on or in the ground).
- 2) If intact, these materials would be considered to have a high probability to release fibers from the forces expected to act upon them during the course of a normal excavation project using heavy equipment.

However, if the materials in the list above are intact when they are discovered, then the materials may possibly be managed in a manner that will not result in the material having a high probability to release fibers (e.g., careful hand removal). In this instance these materials would not be regulated as RACS. This approach, was requested by stakeholders, remains protective, and could be very useful for smaller more isolated accumulations of ACM.

Asbestos cement materials are one subset of Category II non-friable materials that deserve special attention. These materials have a high probability of releasing fibers if they are impacted (broken, crumbled, pulverized) by heavy equipment removing the material during the renovation or demolition of a structure, or if they will be impacted during excavation. Therefore, even though asbestos cement materials are usually considered to be non-friable they are still typically regulated under the NESHAP as RACM due to the high probability to release fibers. It is clear under the NESHAP that once these materials are crumbled they fall under the definition of RACM as Category II non-friable asbestos that has been crumbled, pulverized, or reduced to powder. The Division has taken the position that the terms crumbled and broken are synonymous when applied to asbestos cement materials. The EPA has issued guidance that states that the broken edges of this material are typically friable

(EPA 340/1-90-018), and that the broken edges should be rubbed to see if it produces powder. The generation of the powder from these materials indicates that these materials are friable when broken and result in their regulation under the NESHAP as RACM. Alternatively, the Division is leaving the friability of the material to be determined in the field by a CABI, but does consider this material to be regulated as RACS independent of the CABI's friability determination if the material is broken or crumbled.

Although expected to be rare occurrences, discoveries of asbestos cement materials that are intact (not broken, damaged, crumbled, pulverized, or reduced to powder) and can be managed without breaking, damaging, crumbling, pulverizing, or reducing the material to powder would not be regulated as RACS under the proposed Section 5.5. This is equivalent to the NESHAP in which these materials may also be considered to be non-RACM and managed as such.

5. Stakeholders indicated that the engineering controls used to prevent or eliminate asbestos fibers releases were effective. Several stakeholders provided air monitoring data from their ACS project sites. This information, along with data from other sites reviewed by the Division, indicates that the engineering controls, when used correctly, are effective at controlling the release of asbestos fibers.

The Division and stakeholders have learned that air monitoring detections of asbestos fibers are typically attributable to site management activities. For example, the Division observed repeated detections at some sites following: 1) initial project start-up, 2) a change in work crews, 3) a change in work practices, 4) a change in climate conditions such as increased wind speed, and/or 5) a change in material type. This information was considered when drafting the work practices and air monitoring requirements included in the proposed revision of Section 5.5.

6. Section 5.5.7 of the existing regulations lists the requirements for the disposal of ACS under three categories: 1) ACS with visible non-friable asbestos, 2) ACS with visible friable asbestos, and 3) ACS with no visible asbestos. Currently, Section 5.5 requires disposal of ACS with any amount of friable ACM as friable asbestos waste. This can result in an entire load of primarily soil, or other landfill debris, being disposed of as friable asbestos waste due to the presence of a small amount of friable ACM. However, when considered on a per load basis, it is unlikely that a load of ACS would contain enough asbestos to exceed one percent content by weight, area or volume when composited with the balance of material being managed. The Division established the current disposal requirements in order to protect public health and the environment during transport and disposal of ACS. After further evaluation and discussion with stakeholders, the Division has determined that RACS with small quantities of friable ACM can be disposed as non-friable asbestos waste. RACS being disposed of as non-friable asbestos waste materials will still be transported in a leak tight container, and will be managed at the landfill in a manner protective of public health and the environment.

Some stakeholders expressed a preference for disposal of ACS with less than one percent asbestos, per disposal load, as non-asbestos waste. However, the Division recognizes the need for landfills to comply with all applicable regulations, and to protect the general public disposing of solid waste at landfills and to ensure the protection of landfill employees. Based on general stakeholder feedback and discussions with landfill owners and operators, the Division determined that it is appropriate to base disposal decisions on

the total amount of friable ACM in a disposal load of soil. Allowing disposal to be based on the total amount of friable ACM provides a balance between the relief associated with the cost of disposal of friable asbestos waste, and the protection of public health, while keeping the landfills in compliance with other state and federal regulations. The proposed Section 5.7 requires that soil containing less than one percent of friable ACM in a disposal load (based on visual estimation through continuous inspection) be packaged in a leak tight container and disposed of in accordance with Section 5.2 of the Regulations. This allows for soil containing less than one percent friable ACM, per disposal load, to be disposed of as non-friable asbestos waste. RACS with one percent or greater friable ACM, based upon the total load, must be disposed as friable asbestos waste, in accordance with Section 5.3 of the Regulations. All RACS must be managed and packaged in accordance with Section 5.5, including adequate wetting and disposal in a leak tight container.

7. Some stakeholders have suggested that the Division is regulating “every fiber, everywhere, all the time,” or is using a single fiber threshold to trigger the requirements of Section 5.5. In reality, the current and proposed Section 5.5 do not include a threshold concentration of asbestos in soil since there are no requirements to sample or otherwise characterize the amount or distribution of asbestos in soil. Additionally, the Division believes that Section 5.5 provides a balanced approach to managing the potential risks associated with the disturbance of ACS. The risk associated with ACS is from the inhalation of airborne fibers, and it is extremely difficult to correlate the concentration of asbestos in the soil to a measured concentration of asbestos fibers in air. Rather than require a site-specific risk assessment be conducted at every property with ACS, to determine the potential risks associated with every individual type of ACS disturbance, Section 5.5 establishes risk management practices to be implemented. Short of conducting work in a negative pressure containment, it is very difficult to verify that all fibers released during ACS management are being controlled. Therefore, the Division could not realistically regulate every fiber potentially released when disturbing ACS. Section 5.5 establishes practical and implementable engineering controls to be used in an open-air environment. If applied properly, these practical and implementable engineering controls are very effective in controlling or preventing the release of asbestos fibers. However, the regulation is not intended to control “every fiber, everywhere, all the time.”
8. The proposed revisions to Section 5.5 establish minimum requirements for air monitoring during RACS disturbance. Air monitoring is conducted during RACS disturbance to determine the effectiveness and/or adequacy of the engineering controls. Project experience gained during implementation of the current regulation was used to develop a progressive air monitoring approach based on: 1) retaining a screening level of air monitoring to verify engineering control effectiveness, 2) retaining verification analysis on a subset of screening samples to determine asbestos content, and 3) reducing the air monitoring requirements and frequencies based on demonstrated engineering control effectiveness. If the air monitoring demonstrates that engineering controls are not effective/adequate, the collected data would be the basis for modification of the engineering controls. Adjusting the engineering controls is an iterative process based on air monitoring data, and not an automatic violation of the regulations. Air monitoring is not intended for clearance or the evaluation of risk. Based on stakeholder discussion and consideration, it was agreed that for short duration projects, air monitoring results would not be available quickly enough to make decisions or modifications to engineering

controls. Therefore, the Division and stakeholders agreed that air monitoring would not be required for projects with a duration of less than 2 days of RACS disturbance. In order to discourage potential misuse of this exemption from air monitoring at short duration projects (i.e., by conducting RACS disturbance projects in 2-day increments), the project location and duration must be defined on the RACS project notification form.

9. Some stakeholders raised the concern that Section 5.5 has increased liability for consultants conducting Phase I Environmental Site Assessments (Phase I ESA). To limit their liability, some consultants are including a general statement in their Phase I ESAs that there is a potential that ACS may be present on the property, even when there is no documentation or other evidence suggesting the presence of ACS. This can create an unfounded concern for property owners, potential purchasers and developers.

Section 5.5 does not create a duty to investigate the potential presence of ACS at a property; rather, it requires proper management of ACS if encountered and disturbed. Section 5.5 does not require the extent of ACS be characterized or remediated. If there are no plans to disturb an area of ACS, the requirements of Section 5.5 are not triggered.

The ASTM standard for Phase I ESAs and the EPAs “Standards and Practices for All Appropriate Inquiries” apply to releases and threatened releases of hazardous substances, pollutants and contaminants, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA⁵). The CECLA definitions of “hazardous substance” and “pollutants or contaminants” are broad, and include releases or threatened releases of asbestos (i.e., ACS) as a recognized environmental condition (REC).

However, it is unclear why consultants would include a general statement that ACS may be present if there is no evidence to support this statement. Further, since Section 5.5 does not create a duty to investigate for ACS or remediate ACS, it seems unnecessary to include such a statement unless there is evidence documenting the presence or potential presence of ACS. It is the role of the environmental consultant to understand the scope and limitations of pertinent regulations and advise their clients accordingly. It may be that outreach is needed to further educate environmental consultants regarding the requirements and limitations of Section 5.5. In addition, the Division has funding and is planning training and outreach once the regulations are finalized and this topic can be specifically addressed.

10. Stakeholders expressed concerns that the current Section 5.5 does not include clear criteria for exiting the management requirements of Section 5.5. These concerns have been addressed in the proposed revisions to Section 5.5. Under the proposed revision to Section 5.5.1 Applicability, the initial trigger into the regulation occurs when debris is encountered or disturbed during a soil disturbing activity. Section 5.5.1 requires that a visual assessment of the debris be made to determine if RACS is present. If RACS is present, the management requirements set forth in Section 5.5 apply to all RACS disturbance. If RACS is not present, the management requirements of Section 5.5 do not apply. However, management of solid waste still must comply with the applicable requirements of the Act and Regulations.

⁵ 42 USC 9601

The proposed revisions include procedures that allow for a project to exit out of Section 5.5 when soil disturbing activities no longer involve RACS. These procedures include removal of RACS plus an additional amount of soil/other matrix material and visual confirmation that all RACS has been removed. After RACS removal and visual confirmation, if there is no independent documented evidence of the presence of non-visible asbestos, then the remaining material would not be RACS and not subject to Section 5.5. Soil disturbing activities may then proceed without following the management requirements of Section 5.5 unless or until additional RACS is encountered.

11. There was a discussion during the stakeholder process about the placement of Non-RACS on the surface for reuse. As provided in Section 5.5.2, Non-RACS is exempt from the requirements of Section 5.5, but must be disposed as non-friable asbestos waste in accordance with Section 5.2. This is necessary because Non-RACS is still solid waste containing ACM and is therefore asbestos waste. Onsite disposal of Non-RACS must comply with the solid waste disposal requirements of the Act and Regulations. Onsite reuse of Non-RACS must comply with the Beneficial Use requirements of Section 8.6 of the regulations. If Non-RACS is handled in a manner such that the material becomes RACS, it must be managed in accordance with the requirements of Section 5.5.
12. Some stakeholders have raised questions regarding the Division's authority to establish requirements to protect individuals not covered by the Occupational Safety and Health Act of 1970 (OSHA). One specific example at issue is a truck driver who transports ACS to a landfill, but is not directly involved in soil disturbing activities.

Under the Colorado Solid Wastes Disposal Sites and Facilities Act, the Division has the authority to regulate the proper management of solid waste such as asbestos. Further, C.R.S. § 30-20-101.5 declares that the Division shall "to protect human health and the environment in a manner that... (d) protects the environmental quality of life for affected residents." Although the Occupational Safety & Health Administration (OSHA)⁶ also has authority to regulate asbestos exposure in all construction work,⁷ the Division's authority is independent of OSHA.

There are many examples of differing regulations between OSHA and Federal/State regulations. One example is the differing standards for indoor air contamination, such as the exposure limits set for vapor intrusion.⁸ OSHA standards are generally not risk-based. Instead, the General Duty Clause of OSHA 5(a)(1) states, "Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

In the truck entering the regulated work area example, depending on the asbestos disturbance occurring in the regulated work area, OSHA may require the truck driver to wear the appropriate respiratory protection⁹ and possibly follow through with the necessary decontamination procedures. Regardless, the Division has its own independent

⁶ 29 U.S.C. 651, *et. seq.*

⁷ 29 CFR 1926.1101(a) & 1910.12(b)

⁸ http://www.epa.gov/superfund/sites/npl/Vapor_Intrusion_FAQs_Feb2012.pdf (See pg. 31).

⁹ 29 CFR 1926.1101(e)(3) & 1101(e)(4) & 1926.1101(h)

authority to regulate the management of waste in order to protect the human health and environment. There are numerous instances when the Solid Wastes Disposal Sites and Facilities Act and its implementing regulations regulate the management of waste, which also involves worker safety.

If State statutes and regulations provide authority over an issue that overlaps with OSHA regulations, i.e., waste or public health, the state laws are not superseded or secondary to OSHA.

The Division considers individuals that have not been informed of potential exposures, have not been provided training required by OSHA, and that have not been provided the appropriate PPE to be ancillary workers or members of the public. Section 5.5 includes a requirement that soil disturbing activities cease whenever ancillary workers or members of the public enter a RWA. Initial stakeholder discussions also raised questions regarding the Division's authority to establish requirements to protect individuals covered by OSHA.

13. Some stakeholders had concerns about the role and authority a Certified Asbestos Building Inspector (CABI) has during projects conducted under Section 5.5 and requested that the Division state within the Regulation that CABI judgment would not be challenged by the Division.

The role of a CABI on projects conducted under the current and the proposed Section 5.5 is to inspect for, and to identify suspect ACM, to determine the friability of materials, and, in the proposed regulations, to make RACS vs. Non-RACS determinations. Additionally, CABIs conduct visual inspection for the purpose of determining the percentage of friable ACM within a disposal load. CABIs also inspect for visual clearance for the purpose of exiting management requirements under Section 5.5. Additionally, CABIs collect samples of suspect-ACM, ACM, ACS, and soil to determine the asbestos content of those materials.

The Division will not waive or limit its enforcement authorities. However, as long as CABIs follow established regulatory requirements, industry protocol, and make all reasonable efforts to conduct their duties consistent with all applicable requirements, the Division typically seeks to correct identified issues within the scope of the project.

14. Stakeholders expressed a concern that under the current regulation the boundaries of the area where Section 5.5 applies is unclear. To provide clarity on this issue the following terms were defined in the proposed revisions to Section 5.5:

- "Project" means any soil disturbing activity that involves RACS within a planned geographic area(s) of disturbance, as defined on the "Notification of Regulated Asbestos Contaminated Soil Disturbance" form for that specific management or remediation scope, starting from the time of first RACS disturbance and continuing through final RACS removal or stabilization and final demobilization. A project may include one or more RWAs, and start dates and stabilization dates for individual RWAs within a project may be different.

- “Regulated work area (RWA)” as used in Section 5.5 of these Regulations means the portion(s) of a site at which soil disturbing activities involving RACS occur.

15. Currently, Section 5.5 is applicable based on “reason to know” or “reason to believe” that ACS is present in soil being disturbed. Stakeholders expressed a concern that the current language is too vague and ambiguous. Some stakeholders expressed a desire to use an actual knowledge standard or a due diligence checklist specific to ACS. However, based on consultation with the Attorney General’s Office (AGO), the Division rejected the use of an actual knowledge standard because it is legally unenforceable. The use of a due diligence checklist was also determined to be problematic, resulting in enforcement and interpretation issues. Further discussion resulted in a consensus between the Division and majority of the stakeholders that Section 5.5 applicability would be revised to require that any person that disturbs debris, or encounters debris during soil disturbance, determine whether the debris contains RACS. The presence of RACS is determined based on visual evidence of ACM or documented evidence of non-visible asbestos in soil or ash. The use of “documented evidence” provides clarity while maintaining a constructive knowledge standard.

The inclusion of “documented evidence” in Section 5.5 applicability language, and in the definition of RACS, does not create a duty to sample or otherwise characterize a site to determine if asbestos is present. Further, the removal of RACS (ACM plus 6 inches of surrounding soil) in accordance with the procedures in Section 5.5.7 (which includes removal of RACS plus additional material), would not independently result in there being documented evidence of non-visible asbestos in the material remaining after RACS removal. If there is no independent documented evidence of the presence of non-visible asbestos, then the remaining material would not be RACS and not subject to Section 5.5. However, if samples are collected which demonstrate the presence of asbestos Section 5.5 would apply during disturbance of the sampled material.

16. Some stakeholders expressed a desire to eliminate air monitoring requirements, or only require air monitoring using Phase Contrast Microscopy (PCM) analysis rather than Transmission Electron Microscopy (TEM) analysis. The primary route of exposure to asbestos fibers is inhalation, and because projects conducted under Section 5.5 are not performed in containment, the Division believes that air monitoring is necessary as a means to evaluate whether or not the work practices, including engineering controls, being employed during a RACS disturbance project are effective in mitigating the presence of airborne asbestos. Further, in order to evaluate potential asbestos emissions, air monitoring must include TEM verification on at least a subset of samples.

PCM is a low magnification (up to 400 times magnification) optical microscopic method used to distinguish fibrous material from non-fibrous material. PCM cannot distinguish asbestos fibers from other types of fibers, as the optical characteristics of a fiber cannot be determined. The PCM method is further limited by the fact that only fibers that have diameters $>0.25\ \mu\text{m}$ can be detected. Specific method protocols mandate that only fibers that are $\geq 5\ \mu\text{m}$ in length and that have aspect ratios of $\geq 3:1$ are counted. Therefore, short thin fibers would not be detected using PCM.

TEM is a high magnification (approximately 20,000 times magnification) electron microscopic method used to detect and positively identify asbestos fibers. TEM allows

for the analysis of the crystalline structure of asbestos minerals through electron diffraction, and the elemental composition of the asbestos mineral through energy dispersive X-ray analysis; thereby allowing positive identification of asbestos fibers.

The analytical resolution of TEM is generally 0.1 μm in width, as compared to the resolution for routine PCM of 0.25 μm . Therefore, short thin fibers that would not be detected using PCM will be detected using TEM. In addition, fiber size distribution and mineralogy data can only be obtained using TEM. TEM provides a method for objective verification that work practices/engineering controls are effective in the prevention of airborne asbestos fibers escaping the RWA.

A screening approach using PCM, where all samples are analyzed by PCM and a subset of samples are confirmed by TEM, is a cost effective approach appropriate for evaluating the effectiveness of work practices. Air sampling conducted for the purpose of risk assessment or exposure evaluation would require that all samples be analyzed by TEM. This approach is consistent with the current standard of practice for site characterization used by EPA.

17. Stakeholders requested that air monitoring requirements include a reduced frequency of TEM analysis for projects where engineering controls have been demonstrated to be effective based on initial air monitoring data. Stakeholder discussions resulted in a majority consensus that the frequency of TEM analysis may be reduced after five (5) days of RACS disturbance with no asbestos detections demonstrating the effectiveness of engineering controls/work practices. The reduced frequency of TEM analysis, from daily to once every five (5) days, results in an 80% reduction in samples analyzed by TEM, and the associated costs. However, daily TEM analysis must resume if asbestos is detected during the period of reduced TEM analysis, as this would indicate that the engineering controls/work practices are not effective in preventing asbestos fibers from leaving the RWA. Daily TEM analysis must also resume if there are changes in site conditions, friability of the material, or work practices. Additionally, any PCM analysis indicating a heavy concentration of fibrous material (>0.01 f/cc) would necessitate follow-up analysis by TEM.
18. Stakeholders requested that the Division provide clarification regarding the required response to detections of asbestos in air monitoring samples (analyzed by TEM), and when Division involvement is required. Discussions between the Division and stakeholders resulted in a majority consensus that the Division shall be notified of all asbestos detections by TEM, followed by the submission of an emissions control plan evaluating the reason for the detection and actions taken to prevent future releases. If there are three (3) consecutive asbestos detections or ten (10) detections in a single project, consultation with the Division is required to determine if minimum standards are being implemented appropriately and/or if additional controls are necessary. These requirements are detailed in the minimum requirements for air monitoring in Section 5.5.7.
19. Stakeholders requested clarification regarding the requirements for RACS left in place. The requirements depend on whether RACS is being managed or remediated. Management of RACS under Section 5.5 does not trigger a requirement to characterize or remove all RACS; however, remaining RACS that has been exposed must be stabilized

and/or covered. For RACS remediation projects, where the owner/operator seeks a “No Further Action” or “No Action Determination” from the Division, all RACS must be removed or an environmental covenant will be required if any RACS is left in place. The stabilization and cover requirements for RACS exposed during management also applies to RACS exposed during remediation that will not be removed.

The owner/operator has the option to demonstrate that material left in place is not RACS. This option applies to RACS management and remediation projects. For projects involving only RACs with ACM, where there is no documented evidence of asbestos fibers in soil or ash, visual verification by a CABI would be necessary to demonstrate that no RACS remains in place. For projects where there is documented evidence of asbestos fibers in soil or ash, sampling would be required in addition to visual verification by a CABI.

20. Stakeholders requested clarification regarding the amount of material that requires management under Section 5.5. The definition of RACS includes the asbestos material plus six inches of surrounding soil or other non-asbestos material. Section 5.5.7 outlines procedures for exiting the requirements of Section 5.5 that include the removal of RACS and surrounding material. For example, hand removal of RACS includes the removal of the RACS plus six inches of surrounding material, resulting in the removal of the asbestos plus 12 inches of surrounding material. The procedures in Section 5.5.7 for removal of RACS and surrounding material replace the current Section 5.5.2(A) which provides a mechanism for soil containing only non-friable ACM to be considered non-asbestos contaminated if the non-friable ACM is removed from the soil prior to disturbance. The proposed Section 5.5.7 expands on the applicability of the procedure to all ACM, regardless of friability, allowing for removal of a “pocket” of RACS and surrounding material. After RACS removal and visual confirmation, if there is no independent documented evidence of the presence of non-visible asbestos, then the remaining material would not be RACS and not Subject to Section 5.5.
21. Stakeholders have requested clarification regarding the applicability of Section 5.5 to site characterization. Section 5.5 applies to soil disturbing activities that involve debris that is subsequently determined to be RACS. There is no exemption for soil disturbance conducted during site characterization. Section 5.5.2 does include an exemption for de minimus projects involving the disturbance of less than one cubic yard of total RACS using low emissions methods; however, the decontamination and disposal requirements of Section 5.5 must still be followed. Section 5.5 applies in its entirety to all projects involving the disturbance of RACS greater than one cubic yard, including site characterization, management, and remediation.
22. Stakeholders posed numerous questions regarding 1) reuse of ACS and 2) reuse of soil generated at ACS sites from areas where the soil is not known to be ACS. The disposal requirements of Section 5.5 were expanded to provide clear criteria for reuse and disposal. Section 5.5.8 (previously Section 5.5.7) includes criteria for reuse of RACS within the footprint of the area of concern (AOC) from which it was generated, and reuse outside the AOC, either onsite or offsite, by submitting a plan for beneficial reuse. Any plan for offsite reuse of RACS must be approved by the owner of the property where RACS is proposed for reuse. Section 5.5.8 includes minimum cover requirements for

RACS reuse and also requires an environmental covenant to be placed on the property for areas where RACS is reused.

Section 5.5.8 includes a provision that soil that remains onsite after RACS removal (in accordance with the minimum requirements in Section 5.5.7) is not considered RACS and may be appropriate for onsite and offsite use if it does not contain any other regulated material.

23. There were questions raised during the stakeholder process whether detections of asbestos fibers (by TEM analysis) indicate potential exposures of concern to individuals occupying homes or other structures adjacent to (within 150 feet) an area of RACS disturbance. Based on risk based exposure scenarios developed by the risk assessment work group during the stakeholder process, infrequent, short duration, and low concentration fiber releases correlate to a relatively low risk of exposure to asbestos. Although it is not possible to fully evaluate potential exposure risks without conducting a site specific risk assessment, it is reasonable to correlate frequent asbestos fiber releases, high concentration fiber releases, or extended periods of fiber release to an increased risk of exposure to asbestos. This is the basis for the requirement in Section 5.5.7 for consultation with the Division if there are three (3) consecutive asbestos detections or ten (10) detections in a single project.
24. Some stakeholders expressed concerns regarding costs associated with having a CABI onsite during soil disturbance at sites with a potential for ACM to be encountered, or at sites where debris had been encountered, but where no ACM had been encountered. Stakeholders further suggested that some tasks that have been traditionally conducted by CABIs do not require asbestos inspector training and thus could be performed by other qualified individuals. Discussions between the Division and stakeholders resulted in a majority consensus to establish a new position called a “Qualified Project Monitor” (QPM). QPMs must meet specific training and experience requirements have the authority to make prompt decisions related to the management of materials suspected of containing asbestos. A QPM may not perform tasks specifically required to be conducted by a CABI, such as inspection and identification of RACS, sample collection, or visual clearance, unless the QPM is also a CABI. However, after removal of RACS in accordance with Section 5.5.7, and in the absence of debris, a QPM may make a determination that RACS has been removed and the remaining material is not Subject to Section 5.5. ~~However, if~~ a QPM is performing the duties of a CABI, the QPM must be independent of the general contractor, as required by Section 5.5.3(F). Any individual that meets the training and experience requirements for a QPM (Section 5.5.3(B)) and has the authority to make required decisions may perform the duties of a QPM.
25. Stakeholders requested clarification of the term “low emission methods” used in the exemption for de minimis projects. A proposed definition for this term was added to the exemption, which states “low emissions methods” means soil disturbing activities that will not result in visible emissions without the use of wet methods.” Examples of low emissions methods include careful hand removal, slow and controlled mechanical removal, and use of direct push drilling methods.
26. Stakeholders requested clarification regarding what constitutes an emergency under Section 5.5.4, allowing disturbance of RACS without fully complying with the minimum

requirements of Section 5.5.7. Section 1.2 defines “Emergency” as “an unexpected situation or sudden occurrence of a serious and urgent nature that demands immediate action and that constitutes a threat to life or health, or that may cause major damage to property.

27. Stakeholders requested clarification regarding the applicability of Section 5.5 to bulk materials with asbestos content less than 1% (i.e., non-ACM). The proposed definition of RACS in Section 1.2, is “soil, ash or debris containing ACM, and soil or ash known to contain non-visible asbestos based on documented evidence.” Soil, ash or debris that contains only non-ACM bulk material is not RACS, and therefore not subject to Section 5.5. However, non-ACM bulk material is solid waste subject to the disposal requirements of the Regulations.

28. Stakeholders requested the Division include a grandfather clause to allow SCMPs and SOPs that were approved under the current regulation to be used to comply with the proposed regulation. The Division has added language to Section 5.5.5 that would allow a SCMP or SOP “approved prior to the effective date of the amended regulation, and that complies with the substantive requirements of the regulation prior to amendment” to remain in effect. The Division included “that complies with the substantive requirements of the regulation prior to amendment” to address plans that may have included a one-time variance from Section 5.5 requirements, or that were subsequently determined not to comply with Section 5.5. The Division does not intend to review all existing approved plans to determine compliance with the current version of Section 5.5.

29. Stakeholders requested clarification regarding the applicability of the covenant requirements of § 25-15-320 C.R.S. to RACS or Non-RACS left in place. Under § 25-15-320 C.R.S., an environmental covenant, or notice of environmental use restriction, is required when the Department makes a remedial decision at a remediation project that results in residual contamination that is not protective of all uses, or that incorporates an engineered structure. Projects conducted under the Voluntary Cleanup Program (VCUP) are not subject to the requirements of § 25-15-320 C.R.S. Section 5.5 does not change the applicability of § 25-15-320 C.R.S.

30. Stakeholders requested clarification regarding the requirement in Section 5.5.1(B)(7) to retain onsite, or make available for inspection, records of RACS vs. Non-RACS determinations. Field notes documenting in-field determinations are considered records. If samples are collected to make RACS vs. non-RACS determinations, the analytical reports would also be records that must be retained or made available for inspection.

31. A stakeholder concern has been raised about Division enforcement where the CABI has performed their duties with “reasonable care” and RACS was missed. The Division has a concern with including the term “reasonable care” in the regulation because of the subjective nature of this term. The Division would prefer to not use this term in the Regulation and believes that the procedures set forth in the Regulation, if implemented properly, equate to “reasonable care.” If not implementing the standard procedures set

forth in Section 5.5.7, the objective details of “reasonable care” should be specified in an approved plan.

As long as “reasonable care” includes having a qualified person, QPM or CABI as required, and that qualified person: 1) is performing continuous inspections during soil disturbing activities, 2) is located at the point of generation, and 3) is in a location(s) and at a distance(s) to distinctly identify disturbed materials, then RACS should be identified during soil disturbing activities at the point of generation. The location and distance of the qualified person may vary depending on specific site conditions and the need to more directly inspect and/or sample disturbed materials.

The Division has built in provisions in Section 5.5.7 for incidental discovery of RACS during the management of materials initially determined not to be RACS. This procedure provides for proper identification and subsequent management of incidental discoveries of RACS once identified. The Division incorporated this procedure with the understanding that it may be difficult to identify all RACS generated during a soil disturbing project. As long as a CABI or QPM is performing their duties in a diligent manner, and the RACS is properly managed once identified, the Division would evaluate the facts and merits of each site and incidental occurrences of RACS in determining an appropriate resolution.

Other Department Divisions that use the term “reasonable” in regulations or guidance typically provide specific criteria in general or individual permits. Therefore, the term “reasonable” is quantified and not left to interpretation.

32. Some stakeholders raised an issue about including the term “minimize” in several areas of the regulation. The majority of the stakeholders requested that the language in the regulation be as specific as possible. In addition, several stakeholders requested that the Division not regulate through guidance as previously discussed. The Division has included the term “minimize” when referring to visible emissions within the RWA. This was intentionally done to allow some minimal visible emissions when RACS material was initially being managed. However, the Division disagrees with the use of “minimize” in other areas of the regulation because of the subjective nature of this term.

If the Division utilized the term “minimize” it would have to require specific criteria in the Regulation or in approved plans. The specific criteria may include the establishment of a baseline and/or allowable safe conditions, measurement of deviation from the baseline/safe conditions, evaluations of the effectiveness of efforts to return to baseline/safe conditions, evaluation of additional activities and efforts that may be used to return to baseline/safe conditions.

Alternatives Considered and Why Rejected

Various alternatives were considered and discussed with the stakeholders. The Division considered alternatives in both Section 1.2 definitions and Section 5.5 regulatory requirements.

Based on initial stakeholder requests, two alternatives evaluated were the development of a BMP approach and a risk evaluation process. Development of the BMP approach resulted in the establishment of minimum requirements necessary for proper management of asbestos-contaminated soil. Therefore, the BMP approach became the minimum standards included in Section 5.5.7. The risk assessment work group evaluated exposure scenarios and toxicity values and developed a methodology for evaluating risk. The risk assessment approach remains available under the proposed regulations. However, the majority of the stakeholders agreed that, implementation of the risk approach was determined to be costly and time consuming due to the amount of sampling and analysis that would be required. In addition, the results from the risk assessment approach would provide only a limited ability to reduce the engineering controls required under the proposed section 5.5. In addition, including the risk approach within the proposed regulation would reduce flexibility and limit the ability to incorporate evolving research and science related to asbestos-contaminated soil. During the development of the risk evaluation process, the majority of the stakeholders and the Division concluded that the risk-based approach did not fit well into a regulatory framework, and would be best addressed through guidance to allow for site specific considerations.

Other alternatives considered include:

1. Do nothing - This alternative would result in the current Section 5.5 remaining in effect. This alternative was not acceptable to stakeholders seeking relief from existing requirements of Section 5.5. This alternative was also not acceptable to stakeholders and the Division because it would not provide the additional specificity that stakeholders were seeking. In addition, the Division wanted to address the fact that various stakeholders felt they were being regulated via fiat or through guidance by providing additional specificity in the regulations.
2. City and County of Denver (CCOD) proposal - An alternative BMP matrix was proposed by CCOD that would establish a pick-list of controls and management practices to be chosen by the owner/operator during disturbance of ACS. The alternative BMP matrix would also allow an owner/operator to increase or decrease (“trigger up/trigger down”) the level of controls based on conditions encountered. The Division met with CCOD on several occasions in an attempt to further develop the alternate BMP matrix. Additionally, the alternate BMP matrix was presented to the larger stakeholder group. The alternative BMP matrix was ultimately rejected by the Division and the larger stakeholder group due to the following:
 - a) The alternative BMP matrix lacked the specificity and clarity to be implementable or enforceable.
 - b) Under the alternative BMP matrix, the requirements for proper management of ACS are at the discretion of the owner/operator, and therefore the Division would have no ability to ensure the proper management of ACS.
 - c) Under the alternative BMP matrix, compliance with the BMPs is determined by self auditing rather than through independent oversight or monitoring. Therefore, short of direct Division oversight, there would be no mechanism to ensure compliance with the regulations.
 - d) The alternative BMP matrix included either no air monitoring or monitoring only by PCM, which does not distinguish asbestos fibers from other fibers. Therefore, there would be no mechanism to positively determine if asbestos fibers were being released from the RWA. In addition, the response criteria in the alternate matrix would allow

- a substantial amount of fiber release episodes prior to any action being taken. The Division felt that a system of checks and balances including the positive identification of asbestos fibers through the use of TEM analysis should be required to demonstrate that projects operating under the regulation were utilizing the correct engineering controls and are being protective of public health.
- e) The alternative BMP matrix was presented in a manner that created an “illusion of choice” rather than accurately reflecting the stepwise process necessary to properly manage ACS. Therefore the matrix would not be easily implementable in the field, and would likely lead to improper management of ACS.
 - f) The “trigger up/trigger down” provisions of the alternative BMP matrix assumes that BMPs are being properly implemented and are working as intended, and that the necessary controls are always in place. To the contrary, problems encountered during ACS management often center around improper or insufficient implementation of work practices or inadequate controls in place.
 - g) The alternative BMP matrix “trigger up/trigger down” thresholds were not explicitly provided. Again, this would lead to problems with implementation and enforcement of the matrix.
 - h) The alternative BMP matrix functioned as a pick-list rather than a decision matrix, and did not include all available management options that had been discussed in the larger BMP workgroup.
 - i) The alternative BMP matrix was a significant departure from previous stakeholder input on BMPs. The larger stakeholder group preferred the BMP approach developed by the BMP workgroup because it was more straight forward and implementable, and reflected broad stakeholder consensus.
3. Rescind existing regulation - This alternative was proposed by a few stakeholders, but was rejected by the Division based on the evaluation of alternatives made prior to the promulgation of Section 5.5 by the Board of Health in 2006. Prior to the promulgation of Section 5.5, asbestos contaminated soil was not specifically addressed by regulations. The Division addressed the need to protect public health at asbestos contaminated properties on a case-by-case basis under other existing regulations and statutes. This resulted in a very inefficient, cumbersome, expensive, and time consuming enforcement process. A second alternative considered prior to the promulgation of Section 5.5 was to include regulation of asbestos contaminated soil within Air Quality Control Commission Regulation No. 8. Regulation No. 8 primarily covers abatement of asbestos materials used in structures. The Division, in consultation with the Air Pollution Control Division, decided that the Solid Waste Regulations were a more appropriate location for the regulation of asbestos contaminated soils because 1) the Division is very familiar with soil cleanups and remediation generally, and 2) asbestos contaminated soils are soils containing solid waste and management of the soils is dissimilar from normal asbestos abatement performed in/on buildings or intact underground utility structures.
 4. Use of a 1% asbestos threshold – A few stakeholders requested that the Division regulate only ACM and/or soil containing greater than 1% asbestos. This alternative was previously evaluated during the 2006 rule-making prior to promulgation of the current regulation by the Board of Health. This alternative was rejected both in 2006 and during the current rulemaking process because of the following:

The relationship between the concentrations of asbestos fibers in soil and the concentration of asbestos fibers released into the air is complex. The most critical factor in determining the level of airborne concentrations is the degree of mechanical disruption. Therefore, asbestos concentrations in air cannot be used to predict concentrations of asbestos in soil or vice-versa. Although the acceptable risk-based air concentration value, based on the USEPA Integrated Risk Information System (IRIS) cancer slope factor, is 0.000004 fibers/cc [at a risk level of 1E-06 (1 in a million)], the concentration of asbestos in soil corresponding to 0.000004 fibers/cc in air is not known at this time. However, it has been demonstrated that asbestos content as low as 0.001 % in soil can generate airborne respirable asbestos concentrations greater than 0.1 fiber/mL (0.1 fiber/cc), thus exceeding the OSHA Permissible Exposure Limit (PEL) (Addison et al., 1988).

The Division believes that disturbance of soil with asbestos contamination at levels less than 1% could present unacceptable risks to public. This determination is primarily based on the following evidence:

- 1) EPA OSWER Directive 9345.4-05 (EPA, 2004) which states, “Recent data from the Libby site and other sites provide evidence that soil/debris containing significantly less than 1 percent asbestos can release unacceptable air concentrations of all types of asbestos fibers (i.e., serpentine/chrysotile and amphibole/tremolite).”
- 2) Findings from several studies demonstrate the presence of a complete exposure pathway and/or the generation of airborne fibers at unacceptable levels of risk, from trace levels (i.e., less than 1%) of asbestos in soil, where there is enough activity to stir up soil and cause asbestos fibers to become airborne. As noted in examples given below:
 - Simulated Asbestos Release In Glove – Box Experiments – “Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1 fiber/mL...” (Addison et al., 1988; *The Release of Disturbed Asbestos Fibers from Soil. IOM (Edinburgh) Report TM/88/14*).
 - Simulated Asbestos Release In Activity-Based Personal Monitoring – Elevated levels of asbestos at 0.066 fibers/cc were observed during rototilling a garden in Libby which contained less than 1% asbestos (EPA, December 2001; Dr.Weis Memo).

Therefore, based on current risk information regarding asbestos, there is no known safe level of airborne asbestos. This makes establishing a concentration of asbestos in soil, which would result in an acceptable concentration of airborne asbestos, very difficult. Therefore, the Division chose to take an approach that requires proper management of soil contaminated with asbestos only if it is disturbed. The alternative to the Division’s approach is one that requires a costly and time consuming program of sampling, analysis, and risk assessment to determine a concentration of asbestos in soil that would result in an acceptable risk-based concentration of airborne asbestos if the soil were disturbed. The Division believes its approach is less burdensome and more straight-forward,

particularly at sites with small amounts of asbestos where the cost of sampling, analysis, and risk assessment could far exceed the cost of controls that could be put in place without conducting a risk assessment, and that would likely have to be implemented after the risk assessment is complete.

Neither the current nor the proposed revision to Section 5.5 include a threshold concentration of asbestos in soil or requirements to sample or otherwise characterize the amount or distribution of asbestos in soil. Further, there are no requirements in the proposed regulations to remove or remediate soil contaminated with asbestos. Rather, the regulations require proper management if soil contaminated with asbestos is disturbed. The Division chose the current regulatory approach partly because of the problems inherent in sampling and analysis of asbestos in soil. The Division believes that requiring sampling and analysis, followed by a risk assessment to determine the concentration in soil that could be handled without appropriate controls, is more burdensome than requiring proper management of soil contaminated with asbestos during disturbance.

Risk assessments can be conducted on a site-specific basis; however, this process can be expensive and time-consuming, and therefore may not be appropriate for many projects, especially those of limited scope, those under tight budgets, and those with short development timetables. Because of the burdensome nature of conducting risk assessments, the Division does not believe that it is appropriate to require that a risk assessment be conducted at every site with soil contaminated with asbestos. We believe that the chosen approach of requiring proper management of soil contaminated with asbestos, if it is disturbed, is the most efficient and cost effective for most sites.

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Solid and Hazardous Waste Commission

Hazardous Materials and Waste Management Division

6 CCR 1007-2

REGULATORY ANALYSIS

for

Proposed Amendments to Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part I), Section 5.5, Management of Asbestos-Contaminated Soil, and Section 1.2, Definitions

- 1. A description of the classes of persons who will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule.**

The proposed revisions to Section 5.5 affect entities that disturb asbestos-contaminated soil, including property owners, asbestos abatement contractors, builders/developers, construction contractors, environmental consultants, federal agencies and facilities, utility companies and contractors, local health departments, and state agencies and facilities involved in property redevelopment or construction. These entities would bear the cost of compliance with the requirements for proper management of asbestos-contaminated soil; however, it is anticipated that the proposed revisions will result in cost savings when compared to existing requirements. The Division believes the proposed revisions: a) protect public health and environment while providing relief, where possible, from existing requirements; b) establish a streamlined, straight forward approach to management of asbestos-contaminated soil; and c) clarify ambiguities in the existing regulations.

- 2. To the extent practicable, a description of the probable quantitative and qualitative impact of the proposed rule, economic or otherwise, upon affected classes of persons.**

The proposed revisions to Sections 5.5 clarify management techniques to be employed whenever asbestos-contaminated soil is disturbed. These techniques include asbestos sampling, air monitoring, emissions control, access control, equipment decontamination, and proper disposal of soil and contaminants. Each of these requirements, when

appropriately implemented, has a monetary cost that is borne by affected entities. The existing Section 5.5 already requires these measures; therefore, there are no added costs anticipated due to the proposed revisions. Instead, the proposed revisions include relief from some of the existing requirements, resulting in anticipated cost reductions. These reductions are discussed in detail in the Cost Benefit Analysis. The beneficial impacts of the rules include ensuring appropriate management of asbestos-contaminated soil and exposures to the public at sites where asbestos-contaminated soil is disturbed.

3. The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.

The revisions to the existing Section 5.5 have no added costs to this agency and no other agencies should be affected. In addition, there should be no effect on state revenues.

4. A comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction.

For the proposed revisions to Section 5.5, inaction would continue the *status quo*; sites where asbestos-contaminated soil is disturbed would continue to be subject to the current regulations. The proposed revisions include relief from some of the existing requirements, which are anticipated to reduce costs. A Cost Benefit Analysis (CBA) was prepared as part of this rulemaking process. The CBA presents: 1) major cost drivers in the current Section 5.5 regulations, 2) the proposed revised Section 5.5 regulations, and 3) an estimated cost differential between current and proposed regulations. The regulatory areas evaluated in the CBA include the impact of: 1) changing the definition of “adequately wet,” 2) changing the definition of “asbestos contaminated soil,” 3) changing the applicability of the regulations, 4) changing the air monitoring requirements, 5) changing the material characterization parameters for disposal at a landfill, 6) changing the material reuse options, and 7) including minimum requirements in the regulations that function as a default plan. Promulgation of the proposed revisions is expected to benefit affected entities through cost savings in the categories identified in the CBA.

5. A determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule.

The revisions to the existing Section 5.5 are the result of stakeholder requests to revisit the current regulatory requirements. The revisions include several areas of relief that are anticipated to result in cost savings, while at the same time protecting public health and the environment. The modifications included in the CBA described in #4 above indicate anticipated cost savings in each of the seven categories identified in the CBA. The Division believes there are no less costly or less intrusive methods for achieving the purpose of the proposed revisions.

6. A description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule.

At the request of stakeholders, the Division considered adding Best Management Practices (BMPs) and a risk-based approach to the existing approaches for managing asbestos-contaminated soil. As the risk-based approach was further evaluated, stakeholders and the Division agreed that the risk-based approach did not fit into a regulatory framework, and instead would be best addressed through guidance to allow for site specific considerations. A stakeholder work group was convened to draft BMPs, which addressed various aspects of asbestos-contaminated soil management. The resulting BMPs established the minimum requirements necessary for proper management of asbestos-contaminated soil; therefore, the Division and stakeholders agreed that the BMPs should become minimum requirements under Section 5.5. These minimum requirements: a) eliminate the requirement for a work plan to be submitted; b) provide an immediately implementable work plan; c) eliminate the time and cost associated with Division review of work plans; d) expedite project implementation; e) the minimum requirements provide a predictable framework for developing and implementing work plans. The Regulations also afford the opportunity for site specific work plans.

7. To the extent practicable, a quantification of the data used in the analysis; the analysis must take into account both short-term and long-term consequences.

The Division used stakeholder input, experience, and information gained through the implementation of the current Section 5.5 at a variety of sites across the State in the analysis of the proposed revisions. In addition, the Asbestos Program within the Air Pollution Control Division was consulted. The short and long term consequences of the proposed revisions are: a) maintaining protection of public health; b) continued safe management and appropriate disposal of asbestos-contaminated soil; and c) anticipated decreases in costs to affected entities for management and removal of asbestos-contaminated soil.

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Solid and Hazardous Waste Commission/Hazardous Materials and Waste Management Division

6 CCR 1007-2

Cost Benefits Inputs, Assumptions, Evaluation, and Cost Differential:

Section 5.5 of the Regulations Pertaining to Solid Waste Sites and Facilities (6 CCR 1007-2, Part 1; Regulations) was promulgated in 2006. The stakeholder process for the proposed revisions to Section 5.5 started on October 5, 2011. During the initial meeting a couple of the stakeholders requested the Division perform a cost benefit analysis. Further, a couple of stakeholders further requested the cost benefit analysis compare the cost of implementing a construction project not subject to Section 5.5 of the regulations to a similar construction project subject to the proposed Section 5.5 of the regulations. In response, the Division indicated that the requested cost benefit was part of the 2006 rulemaking process and not part of the current regulatory revision process. The Division agreed to perform a cost benefit analysis between the current and proposed Section 5.5 Regulations.

The following table presents: 1) major cost drivers in the current Section 5.5 regulations, 2) the proposed revised Section 5.5 regulations, and 3) an estimated cost differential between current and proposed regulations. The regulatory areas evaluated in this cost benefit analysis include the impact of: 1) changing the definition of “adequately wet,” 2) changing the definition of “asbestos contaminated soil,” 3) changing the applicability of the regulations, 4) changing the air monitoring requirements, 5) changing the material characterization parameters for disposal at a landfill, 6) changing the material reuse options, and 7) including minimum requirements in the regulations that function as a default plan . The Division recognizes that the current Section 5.5 increased the cost of construction projects that were not previously subject to Section 5.5 requirements. The Division is proposing to modify the existing regulations based on experience gained from implementing the regulations over the last seven years. The modifications included in this cost benefit analysis resulted in cost savings in each of the seven categories identified above. The Division recognizes that individual project costs will vary depending on a variety of factors and negotiated prices. This evaluation used representative project related costs.

Current Regulation	Proposed Regulation	Cost Differential
Adequately wet	Adequately wet	Cost Differential
<p>“Adequately wet” means sufficiently mix or penetrate with liquid to completely prevent the release of particulate material and fibers into the ambient air. If visible emissions are observed coming from asbestos-contaminated soil or asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.</p>	<p>“Adequately wet” means sufficiently wet to minimize or eliminate visible emissions of dust and/or debris within the regulated work area and prevent the release of visible emissions from leaving the Regulated Work Area (RWA). The observance of visible emissions, outside of the RWA regulated work area, of dust and/or debris is an indication that soils are not adequately wet.</p> <p>The proposed regulations are predicated on controlling the risk of inhaling asbestos fibers and confining emissions to the RWA, work based on active field observations, resulting in a reduction in water usage.</p>	<p>Estimated Cost Differential: The amount of water used per project varies depending on the type of soil, solid waste, and other environmental and site specific conditions. These variables and factors make the amount of water used per project difficult to predict. The proposed regulations are expected to reduce cost by: 1) reducing staff time dedicated to “mixing and penetrating” activities, 2) limiting overwatering which increased the weight and cost of the material being disposed, and 3) reducing the amount of water required per project. The water cost savings is estimated at \$0.15/yd³.</p>
<p>“Asbestos-contaminated soil” means soil containing any amount of asbestos.</p>	<p>“Regulated Asbestos Contaminated Soil” (“RACS”) means soil, ash or debris (plus 6 inches in all directions of surrounding soil or other matrix material):</p> <p>The proposed regulations are based on managing the potential risk from inhaling asbestos fibers in contrast to managing soil with “any amount of asbestos.” The proposed RACS approach has several key advantages as follows: 1) RACS focuses on materials that have a high potential to release fibers, such as: friable asbestos materials, non-friable asbestos containing materials that have a high propensity to release fibers, and handling</p>	<p>“Estimated Cost Differential: The proposed regulations are expected to reduce the amount of time and costs for each of the items listed below:</p> <ol style="list-style-type: none"> 1) Cost savings per day of CABI on site: \$55/hr; 2) Time savings by allowing removal of RACS and continuation of the project not subject to Section 5.5; This proposed change will reduce costs by not requiring all associated management and air monitoring costs identified below; 3) RACS removal with surrounding soil eliminates sampling. Cost of

	practices that could cause nonfriable materials to release fibers, 2) the proposed approach utilizes Certified Asbestos Building Inspector's (CABI's) training, experience, and professional judgment to make in-field/real-time determinations of material type and condition, 3) the proposed approach will also allow the visual removal of RACS, with the surrounding soil, and the remaining soils will not be subject to Section 5.5, until such time that more RACS is encountered, and 4) the proposed regulations includes an exemption for non-friable asbestos containing materials that do not have a high propensity to release fibers.	<p>sampling: \$12 - \$15/PLM</p> <p>4) RACS removal with surrounding soil reduces disposal of RACS will reduce disposal cost: Est. \$300/yd³ (100yds), \$75/yd³ (100-1,000yds), \$65/yd³ (1,000+ yd³)</p> <p>5) While difficult to quantify due to the site specific variability in the type of ACM managed during projects, the revised regulations will not require management under Section 5.5 of non-friable materials that do not have a high propensity to release fibers.</p>
Applicability	Applicability	Cost Differential
The requirements apply to property with asbestos-contaminated soil at which soil-disturbing activities are occurring or planned for any area containing asbestos-contaminated soil. The requirements are triggered when the owner or operator has reason to know of asbestos-contaminated soil at a site or observed material that is suspected of containing asbestos, or has reason to believe that visible asbestos may be encountered. This approach is predicated on a reason to believe and may cause the implementation of Section 5.5 requirements when no asbestos contaminated soil is known to be present.	If debris is disturbed or encountered during soil disturbance, a Qualified Project Monitor (QPM) must observe soil disturbing activities and determine if suspect asbestos containing material is encountered. Currently many of the Section 5.5 soil management plans require the use of a CABI when solid waste is encountered. The proposed regulations recognizes that many solid wastes do not include asbestos containing material, asbestos materials that have a propensity to release asbestos fibers, or involve handling practices that will release asbestos fibers. The proposed approach will allow the use of a QPM and reduce the number of days and hours that a CABI is required to be onsite. The proposed approach is based on visual observations identifying when suspect asbestos containing material is encountered.	<p>The proposed regulations are expected to reduce the number of days that a project is subject to the Section 5.5 regulatory requirements. Each day of not being subject to Section 5.5 may reduce project costs, not including disposal costs, as identified below:</p> <p>1) CABI: \$55/hr or \$440/day;</p> <p>2) Air Monitoring: \$830/day;</p> <p>3) Elimination of asbestos contaminated soil management and disposal costs ranging from \$60/yd³ to \$350/yd³. ; and</p> <p>4) Elimination of watering unregulated soils is approximately \$0.15/yd³</p> <p>5) More reuse of soils reduces costs as depicted below.</p>

	Therefore, the owners/operators do not have to prematurely implement the Section 5.5 requirements. Since the regulations are applicable upon the disturbance or observation of suspect asbestos containing material, they will still minimize the release of asbestos fibers and remain protective of human health and the environment.	
Air Monitoring	Air Monitoring	Cost Differential
An air monitoring plan is required that demonstrates dust-control measures to ensure the safety of people in and around the work area and prevent release of asbestos fibers outside the work area. The air monitoring plan shall include a contingency plan for immediate work stoppage, or modification of dust control measures, in the event that approved measured or visible dust limits, as defined in the air monitoring plan, are exceeded in or around the work area. The typical asbestos contaminated soil management plan includes, on a daily basis: 4 ordinal samples, 2 area equivalent on-personnel samples and 2 downwind floaters samples collected and analyzed via PCM. Follow up TEM analysis of the two highest PCM samples is also typical.	Air monitoring is required to verify the effectiveness of the engineering controls and ensure they are minimizing the release of, and/or exposure to, asbestos outside of the RWA. The regulations incorporate a tiered air monitoring approach providing less frequent air monitoring given demonstrated effectiveness of work practices. The regulations include work practices specific to mechanical and/or hand disturbance of RACS including measures to prevent the release of visible emissions outside of the RWA. The air monitoring requirements are progressive depending on the method of disturbance, friability of material, and presence of receptors. Air monitoring is not required for hand disturbance of RACS, and air monitoring is not required for RACS projects of two days or shorter duration. This is allowed because the analytical results will not be received in time to affect changes in engineering controls.	<p>The proposed regulations incorporate several key changes to the air monitoring requirements as follows:</p> <ol style="list-style-type: none"> 1) Projects of 2 days or fewer require no air monitoring: Cost savings based against the current regulations is approximately \$1,660. 2) Projects with a 150' buffer (i.e., no adjacent receptors) require no air monitoring: Cost savings based against the current regulations is approximately \$4,150/every 5 days. 3) Single and Multiday non-friable and friable projects will have an estimated cost savings from reduced TEM and PCM samples/analysis, of \$155/day (\$775/5 day) and \$40/day (\$200/5 day) respectively. <p>The cost estimates for current, proposed non-friable, proposed friable single, less than 5 day, and greater than 5 day are provided below</p>

<u>Current Regulations</u>				<u>Proposed Non-Friable <5 Day</u>				<u>Proposed Friable < 5 Day</u>			
#	Activity	Cost	Tot	Activity	Cost	Tot		Activity	Cost	Tot	
8	PCM	\$ 20	\$ 160	4	PCM	\$ 20	\$ 80	6	PCM	\$ 20	\$ 120
2	TEM (+/-)	\$ 75	\$ 150	1	TEM (+/-)	\$ 75	\$ 75	2	TEM (+/-)	\$ 75	\$ 150
8	AMS - Hrs	\$ 65	\$ 520	8	AMS - Hrs	\$ 65	\$ 520	8	AMS - Hrs	\$ 65	\$ 520
		Per Day	\$ 830			Per Day	\$ 675			Per Day	\$ 790
<u>Current</u>				<u>Proposed Non-Friable > 5 Day</u>				<u>Proposed Friable > 5 Day</u>			
#	Activity	Cost	Tot	Activity	Cost	Tot		Activity	Cost	Tot	
40	PCM	\$ 20	\$ 800	20	PCM	\$ 20	\$ 400	30	PCM	\$ 20	\$ 600
10	TEM (+/-)	\$ 75	\$ 750	5	TEM (+/-)	\$ 75	\$ 375	10	TEM (+/-)	\$ 75	\$ 750
40	AMS - Hrs	\$ 65	\$ 2,600	40	AMS - Hrs	\$ 65	\$ 2,600	40	AMS - Hrs	\$ 65	\$ 2,600
		5 Day	\$ 4,150			5 Day	\$ 3,375			5 Day	\$ 3,950
Disposal Cost:				Disposal Cost:				Cost Differential			
<p>The current regulations list the requirements for the disposal of ACS under three categories: 1) ACS with visible non-friable asbestos, 2) ACS with visible friable asbestos, and 3) ACS with no visible asbestos. Currently, Section 5.5 requires disposal of ACS with <i>any</i> amount of friable ACM as friable asbestos waste. This results in an entire load being disposed of as friable asbestos waste due to the presence of a small amount of friable ACM.</p>				<p>The proposed regulations approach the issue of disposal on a per load basis. If a volume of debris contains less than 1% of friable ACM per load, based on visual estimation through continuous inspection, and the debris is all assumed to be RACS, then a CABI is not required to make a friable ACM determination. This provision is based on the premise that soil is the primary matrix and the debris and/or RACS is only a portion of the total load being managed or disposed. This approach will still remain protective because: 1) landfills will be notified of the material content and source, 2) landfill employees are trained to manage these materials in a safe manner, 3) the landfill is a permitted, controlled and managed disposal setting, 4) general public is prevented from co-disposing of materials at landfills, and 5) the materials will be buried in a timely manner.</p>				<p>The proposed regulations may have an estimated reduced disposal cost as follows :</p> <ol style="list-style-type: none"> 1) Less material will require disposal as friable asbestos waste. This will allow for disposal of RACS and surrounding matrix at more and closer landfills. 2) Reduced hauling costs: \$100/hour 3) Reduced liner costs: \$100-\$200/ liner. RACS requires 1 liner versus material disposed of as friable asbestos waste. Cost saving of staff not watching the loading and lining activities \$65/hr. 4) Less material subject to Section 5.5 with potentially avoided excavation, loading, hauling, and disposal combined costs ranging from \$60/yd³ to \$350/yd³. 			

Material Reuse:	Material Reuse:	Cost Differential:
Section 5.5.7 states “ (D) Soils that are not asbestos-contaminated, based on analysis showing no detectable amounts of asbestos, may be replaced into the disturbed area as needed, used as fill, or disposed as solid waste.” Therefore, even the onsite reuse of soil requires sampling.	<p>The proposed regulations allow the reuse of materials on-site under the following constructs:</p> <ol style="list-style-type: none"> 1) Onsite reuse of RACS within the originally impacted area with appropriate cover and environmental covenant; 2) Beneficial use of RACS outside of the originally impacted area may be approved by the Department pending approval of a beneficial use plan, appropriate cover and environmental covenant; 3) RACS soils that are clean of ACM and subsequently verified clean via visual inspection and sampling may be reused without restriction. <p>These approaches recognize the potential geotechnically sound properties of RACS impacted soils as fill materials with specific restrictions and criteria including covers, environmental covenants and an evaluation of the beneficial merits of RACS impacted soils while still being protective.</p>	<p>Estimated Cost:</p> <p>The proposed regulations may reduce the cost of asbestos contaminated soil projects by:</p> <ol style="list-style-type: none"> 1) Reducing or eliminating the need to transport contaminated soil for disposal; Haul truck approx \$100/hr 2) Reducing or eliminating the disposal cost of contaminated soil estimated at between \$65.00 - \$300.00 per cubic yard for non-friable RACS; 3) Reducing or eliminating the cost of sampling soil for “clean verification”: Cost Approx. \$12 - \$15 /sample and 4) Reducing or eliminating the cost of clean fill material;
Plan Development	Plan Development	Estimated Cost
The current regulations do not contain a default plan. Therefore owners and operators must develop SOPs or a site specific plan prior to commencing soil disturbing activities with or suspected to contain asbestos contaminated soil. The current regulations contain regulatory requirements, but not guidance on	The proposed regulations include minimum requirements that serve as a default plan. Facilities may elect to follow the default requirements and go directly to project implementation following notification, without waiting for Department review or approval. In addition, the proposed regulations allow for the development of standard operating	Estimated cost saving for eliminating plan development is approximately \$2,000 to \$4,000.

<p>developing a plan. Although, the Department, in conjunction with stakeholders, developed the guidance document to support the current regulations, the regulated community has alleged that the Department was regulating their projects via fiat through the guidance. Therefore, the regulated community and stakeholders requested that the Department develop directly implementable regulatory requirements.</p>	<p>procedures and a site specific management plan.</p> <p>The minimum requirements that serve as a default plan were developed with stakeholder input as means to expedite the implementation of RACS projects. The minimum requirements: 1) eliminate the requirement for a plan to be developed and submitted for Division review and approval; 2) provide an immediately implementable plan; 3) eliminate the time and cost associated with Division review of plans; 4) expedite project implementation; 5) the minimum requirements provide a predictable framework for developing and implementing site specific management plans. The minimum requirements eliminate regulating via guidance: and are deemed to be protective of potential receptors.</p>	
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