

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

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

6 CCR 1007-2

PART 1 - REGULATIONS PERTAINING TO SOLID WASTE SITES AND FACILITIES

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 Revision to Section 1.2 Definitions

(Adopted by the Solid and Hazardous Waste Commission on August 19, 2014)

1) Amend Section 1.2 by adding the following definitions in alphabetical order to read as follows:

1.2 Definitions

“Adjacent Receptor Zone” means an area of uncontrolled access at a distance of 150’ or less from the nearest Regulated Work Area (RWA) boundary during active Regulated Asbestos Contaminated Soil (RACS) disturbance. For the purpose of this definition, highways, streets, and roads without sidewalks, where only vehicles are permitted, are considered to be areas of controlled access and therefore not adjacent receptor zones. For the purpose of this definition "vehicle" means a device that is capable of moving itself, or of being moved, from place to place upon wheels, including bicycles and electrical assisted bicycles. For the purpose of this definition, an area for which access is not ordinarily controlled that is closed to the public during soil disturbing activities in the adjacent RWA is considered to be an area of controlled access and therefore not an adjacent receptor zone.

“Air Monitoring Specialist” (“AMS”) means a person trained and certified, in accordance with the requirements of Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), for the collection of air samples to determine airborne particulate and/or asbestos concentrations.

“Ancillary Worker” means a worker that has not completed the training under Section 5.5.3(A) and (B) of these regulations.

“Area of Contamination” (“AOC”) means a discrete, discernible area of known RACS.

“Certified Asbestos Building Inspector” (“CABI”) means a person trained and certified in accordance with Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), for the identification of asbestos-containing materials and the collection of samples to determine asbestos content, including qualified Department personnel.

“Debris” means any discarded material that contains or consists of any of the following: construction, renovation and demolition debris (regardless of how it was generated), building or facility components, components of building systems (HVAC, plumbing, electrical, control, fire protection, roofing), components of pavement or drainage systems, industrial or machinery components, and/or mechanical components from motorized vehicles.

“Friable asbestos-containing material” (“Friable ACM”) means any material that contains asbestos and when dry can be crumbled, pulverized, or reduced to powder by hand pressure and that contains more than one percent asbestos by weight, area, or volume. The term includes non-friable forms of asbestos after such previously non-friable material becomes damaged to the extent that when dry it can be crumbled, pulverized, or reduced to powder by hand pressure as determined in the field by a CABI.

“Geofabric” for the purposes of Section 5.5 means a permeable fabric or synthetic material used for both visual and physical separation.

“Low Emissions Methods” means soil disturbing activities that will not result in visible emissions without the use of wet methods.

“Non-Regulated Asbestos Contaminated Soil” (“Non-RACS”) means soil or debris that contains only:

- 1) Intact non-damaged, non-friable asbestos-containing materials (ACM); or,
- 2) Damaged non-friable ACM(s) that do not have a high probability to release fibers based on the forces expected to act upon the material during disturbance as determined in the field by a CABI(s) through a “RACS Determination”. The following ACM(s) are predetermined to be Non-RACS:
 - a. Resin based materials including but not limited to phenolic-plastic (Bakelite), used in electrical and mechanical parts
 - b. Resilient flooring (vinyl, asphalt, rubber) excluding non-tar impregnated friable felt backing on sheet vinyl flooring (linoleum)
 - c. Tar impregnated or asphaltic materials in good condition that have not become brittle
 - d. Elastic, pliable, or rubberized materials, including but not limited to:
 - i. Pliable duct sealant
 - ii. Pliable fiberglass insulation sealant
 - iii. Pliable fire-stop caulking /sealants
 - iv. Pliable window and door caulking
 - e. Extremely hard materials, coatings and sealants including but not limited to:
 - i. Laboratory countertops and sinks
 - ii. Epoxy type Concrete Masonry Unit (CMU) coatings
 - iii. Epoxy type panel adhesive
 - iv. Duct sealant
 - v. Ceiling tile adhesive
 - f. Other ACM(s) as approved by the Department at the request of the owner or person disturbing debris, to not have a high probability to release fibers.

"Project" means any soil disturbing activity that involves Regulated Asbestos Contaminated Soil (RACS) within a planned geographic area(s) of disturbance, as defined in the Notification of RACS Disturbance form submitted 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 Regulated Work Areas (RWAs), and start dates and stabilization dates for individual RWAs within a project may be different.

“Project Specific RACS Management Plan” (“PSRMP”) means a Regulated Asbestos Contaminated Soil (RACS) management plan for a single project submitted in accordance with Section 5.5.5(A).

“Qualified Project Monitor” (“QPM”) means an individual who has the training and/or experience necessary to identify materials suspected of containing asbestos and who has the authority to make prompt decisions relating to the management of such materials, and who meets the training requirements in Section 5.5.3.

“Regulated Asbestos Contaminated Soil” (“RACS”) means soil, ash or debris (plus six (6) inches in all directions of surrounding soil or other matrix material) containing:

- 1) Friable asbestos-containing materials (ACM) as determined in the field by a Certified Asbestos Building Inspector (CABI) through a RACS determination;
- 2) Previously non-friable ACM(s) that have been rendered friable as determined in the field by a CABI(s) through a RACS determination;
- 3) Non-friable ACM(s) that have a high probability of releasing fibers based on the forces expected to act upon the material during soil disturbance as determined in the field by a CABI(s) through a RACS determination;
- 4) Deteriorated non-friable ACM(s) that are in poor condition resulting in a high probability to release fibers due to weathering, historical mechanical impact, fire damage (by evidence of ACM within an ash layer) or other factors as determined in the field by a CABI(s) through a RACS determination;
- 5) The following broken, resized, or damaged ACM(s) are RACS:
 - a. Asbestos cement materials
 - b. Plaster
 - c. Brittle caulking, glazing and sealants
 - d. Powdery Concrete Masonry Unit (CMU) sealant
 - e. Powdery floor leveling compound
 - f. Drywall/wallboard and associated joint compound material
 - g. Firebrick
 - h. Other material as determined by the Department, at the request of the owner or person disturbing debris, to have a high probability to release fibers.

- 6) Soil or ash known to contain non-visible asbestos based on documented evidence.

“RACS Determination” for the purpose of Section 5.5 means a determination, conducted in the field by a Certified Asbestos Building Inspector (CABI), of the friability of Asbestos Containing Material (ACM) and the probability of non-friable ACM to release fibers based on the condition of the material and the forces that are expected to act on it during disturbance. Determinations of friability shall be based on the requirements for such determinations set forth in Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B). Determinations of the probability for non-friable ACM to release fibers during disturbance shall be based on the following:

- 1) The condition of the material prior to disturbance, based on observations of weathering, the integrity of the material, historical mechanical impact, or fire damage;
- 2) The potential for the material to be broken, resized or damaged during planned disturbance;
- 3) The material shall be considered RACS if the planned disturbance includes any of the following:
 - a. Augers
 - b. Rotary style trenchers
 - c. Driving on ACM lying on the surface (vehicles or equipment)
 - d. Blasting or other detonation
 - e. Intentional burning
 - f. Other types of direct mechanical impact which are:
 - i. In direct contact with ACM or result in observation of ACM after disturbance, and
 - ii. Causing damage to the ACM

“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.

“Risk-Based Air Threshold” for the purpose of Section 5.5 means one of the following thresholds based on project duration and receptor population, or as approved by the Department, as determined based on the sampling, analytical, and data evaluation procedures provided in Appendix 5A:

- a. an average of 0.003 fibers per cubic centimeter (f/cc) for projects with durations of thirty (30) working days or less with child receptors;
- b. an average of 0.0003 f/cc for projects with durations between thirty (30) working days and one calendar year with child receptors;
- c. an average of 0.006 f/cc for projects with durations of thirty (30) working days or less with only adult receptors, including commercial workers and non-OSHA workers;
- d. an average of 0.0006 f/cc for projects with durations between thirty (30) working days and one calendar year with only adult receptors excluding commercial workers and non-OSHA workers;
- e. an average of 0.0009 f/cc for projects with durations of between thirty (30) working days and one calendar year with only commercial worker receptors;
- f. an average of 0.001 f/cc for projects with durations between 30 days and one year with only non-OSHA worker receptors;
- g. if the total duration of the project exceeds, or is anticipated to exceed, one year, the owner/operator shall contact the Department for a project specific risk-based threshold.

“Staging” for the purposes of Section 5.5, means the accumulation of RACS in the RWA for twelve (12) hours or less.

“Standard Operating Procedure” (“SOP”) means a RACS management plan for multiple projects submitted in accordance with Section 5.5.5(B).

“Stockpiling” for the purposes of Section 5.5, means the accumulation of RACS that will exist for more than twelve (12) hours, up to and including ten (10) calendar days.

“Storage” for the purposes of Section 5.5, means the accumulation of RACS greater than ten (10) days, but not exceeding six (6) months unless a longer timeframe is approved by the Department and complies with local governing authority requirements.

“Visible” means capable of being seen with the unaided eye.

“Visual Inspection” for the purposes of Section 5.5 means observation with sufficient proximity to identify discrete visible materials, while maintaining the safety of the inspector.

2) Amend Section 1.2 by revising the following definitions to read as follows:

1.2 Definitions

“Adequately wet” means sufficiently wet to minimize visible emissions of dust and/or debris within the regulated work area (RWA) and either:

- a. Prevent the release of visible emissions from leaving the RWA in accordance with Section 5.5 of these regulations; or
- b. Demonstrate that asbestos fibers are not leaving the RWA above risk-based air thresholds.

The observance of visible emissions, outside of the RWA, of dust and/or debris may be an indication that soils are not adequately wet.

“Asbestos” means the asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), amosite (cummingtonite-grunerite), anthophyllite, actinolite and tremolite.

“Asbestos-containing material” (“ACM”) means any material that contains more than one percent (1%) asbestos.

“Friable asbestos waste” means any asbestos waste that has been or can be pulverized or reduced to powder by hand pressure when dry.

“Mechanical” means operated or produced by mechanism, tool or machine.

“Soil-disturbing activities” means digging, excavating, staging, loading, stockpiling, backfilling, compacting, grading, tilling, drilling, intrusive sampling, and equipment or vehicle movement or any other mechanical activity, that when used, disturbs the surface and/or subsurface soil. For the purposes of Section 5.5 disturbance or removal of

debris and/or RACS is considered a soil disturbing activity. For the purposes of Section 5.5 hand disturbance or removal of RACS is subject to this regulation, but is not considered to be a mechanical disturbance.

“Visible emissions” means any airborne or liquid emissions, coming from, or having come into contact with RACS, which are visually detectable without the aid of instruments. Proper disposal of appropriately filtered decontamination water does not constitute a visible emission.

3) Amend Section 1.2 by deleting the definition of “Asbestos-contaminated soil” as follows:

1.2 Definitions

~~**“Asbestos-contaminated soil”** means soil containing any amount of asbestos.~~

4) Add a Table of Contents for Section 5 (Asbestos Waste Management) to read as follows:

SECTION 5

ASBESTOS WASTE MANAGEMENT

- 5.1 General Provisions
- 5.2 Non-Friable Asbestos Waste Disposal Areas
- 5.3 Friable Asbestos Waste Disposal Areas
- 5.4 Storage of Asbestos Waste
- 5.5 Management of Regulated Asbestos-Contaminated Soil (RACS)
 - 5.5.1 Scope and Applicability
 - 5.5.2 Exemptions
 - 5.5.3 Training
 - 5.5.4 Response to Unplanned RACS Discovery
 - (A) Immediate Actions

- (B) 24-Hour Notification Requirements
- (C) Interim Actions
- 5.5.5 Response to Planned RACS Management
 - (A) Project Specific RACS Management Plan (PSRMP)
 - (B) Standard Operating Procedures (SOPs)
 - (C) Standard Requirements of Section 5.5.7
 - (D) Risk Based Approach
- 5.5.6 Remediation of Asbestos in Soil
- 5.5.7 Standard Requirements for the Disturbance of RACS
 - (A) Establishment and Control of a Regulated Work Area (RWA)
 - (B) Personal Protective Equipment (PPE) for the Purposes of Preventing Cross-Contamination
 - (C) Wetting
 - (D) Wind Speed Monitoring
 - (E) Air Monitoring
 - (F) Work Practices to be Followed During RACS Disturbance
 - (G) Loading and Placement of RACS
 - (H) Onsite Staging, Stockpiling, and Storage of RACS
 - (I) Decontamination
 - (J) RACS Spill Response
 - (K) Requirements for Exposed RACS Remaining in Place
 - (L) Documentation
- 5.5.8 Packaging and Disposition of Regulated Asbestos-Contaminated Soil (RACS)
 - (A) Disposal of RACS
 - (B) Onsite Reuse of RACS
 - (C) Demonstration of Non-RACS
- 5.5.9 Fees

Appendix 5A: Sample Collection Protocols and Analytical Methodologies

5) Delete the existing Section 5.5 Regulations (Management of Asbestos-Contaminated Soil) in their entirety and replace with a new Section 5.5 Regulations (Management of Regulated Asbestos-Contaminated Soil (RACS)) to read as follows:

SECTION 5

ASBESTOS WASTE MANAGEMENT

5.5 MANAGEMENT OF REGULATED ASBESTOS-CONTAMINATED SOIL (RACS):

5.5.1 SCOPE AND APPLICABILITY

The requirements of Section 5.5 apply to the owner or operator of any property with regulated asbestos contaminated soil (RACS) at which soil-disturbing activities are occurring or planned. The owner/operator may choose to follow the procedures set forth in Sections 5.5.1(A) and 5.5.1(B) below when debris is exposed or disturbed to determine if the debris is RACS. The requirements of Sections 5.5.1(C) and 5.5.1(D) apply when RACS is exposed or disturbed.

(A) Any person who disturbs debris or exposes debris during a soil disturbing activity shall characterize debris to determine the applicability of Section 5.5, and have appropriate personnel to characterize debris. Any person who disturbs debris or exposes debris during a soil disturbing activity shall:

(1) Conduct visual inspection of disturbed material;

(2) If debris is exposed during soil disturbing activities, and/or the soil or ash is known to contain asbestos fibers, through documented evidence, then Section 5.5 is applicable. If there is no visible RACS or documented evidence of RACS at a site, an owner/operator does not have a duty under these regulations to sample or otherwise investigate for RACS prior to commencing soil disturbing activities;

(3) If debris is exposed that only contains green waste, and/or natural stone with no associated material suspected of containing asbestos fibers, then Section 5.5 is not applicable.

(4) In the event of an emergency in which a soil disturbing activity in an area of debris must continue or commence at once, a RACS determination in accordance with Section 5.5.1(B) may be postponed during the initial response to the immediate emergency. However, the RACS determination must be made within 48 hours of the initial emergency response.

(5) Any person who exposes but does not disturb debris during a soil disturbing activity shall have protocols to characterize debris as required by this section 5.5.1(A) and stabilize any debris determined to be RACS as required by Section 5.5.7(K), unless the debris is exempted by subsection 5.5.2(A) through (F).

(B) Any person who disturbs debris during soil disturbing activities, when the subject debris is not excluded within Section 5.5.1(A)(3), must inspect the debris, through continuous visual inspection during soil disturbing activities, to determine if the debris is, or contains, suspect asbestos-containing material (ACM). If debris is exposed that only contains metal, glass, plastic, wood, and/or bare concrete with no associated material suspected of being ACM (such as sealants, adhesives, mastics, coatings, adhered materials, or resins), then Section 5.5 is not applicable. The

person(s) conducting the visual inspection must be a Qualified Project Monitor (QPM) or a Certified Asbestos Building Inspector (CABI).

All suspect ACM(s) must be:

- (1) Assumed to be ACM; or
- (2) Sampled by a CABI. The samples shall be analyzed by a National Voluntary Laboratory Accreditation Program (NVLAP) participating laboratory utilizing Polarized Light Microscopy (PLM) (EPA Method 600/R-93/116 or equivalent) to determine if it is ACM; or
- (3) Determined to be ACM, or non-ACM, through the use of documentation specific to the material observed in the field establishing the asbestos content of the material (e.g. laboratory analysis results from previous encounters with the same material).
- (4) The ACM determination shall be made within seven (7) calendar days of discovery of the debris.
 - (a) Within 24 hours of discovery of debris, and until the ACM determination is made, the debris shall be stabilized in accordance with Section 5.5.4(A)(3) of these regulations.
 - (b) No additional disturbance, other than necessary to perform the required stabilization in Section 5.5.4(A)(3), of the debris shall occur prior to the asbestos determination.
- (5) A person who disturbs debris, determined or assumed to be or contain ACM per this 5.5.1(B), shall determine if the ACM is exempted in accordance with Section 5.5.2 of these regulations.
- (6) A person who disturbs debris, determined or assumed to be or contain ACM per this 5.5.1(B), shall make a RACS determination by:
 - (a) Assuming the debris containing ACM is RACS and managing the RACS in accordance with Section 5.5 of these regulations; or
 - (b) Applying site and material specific knowledge of the presence or absence of RACS based on observation and/or documented evidence about the nature of ACM(s).
- (7) The owner/operator shall retain, or make available for inspection, records of all RACS determinations onsite for the duration of the debris disturbance, which shall be retained by the owner/operator for a period of six (6) months after the completion of debris disturbing activities.

(C) Soil or ash known to contain non-visible asbestos, based on documented evidence, is RACS and if exposed or disturbed shall be managed in accordance with these regulations.

(D) If soil, ash, or debris is, or contains, RACS then:

- (1) RACS that is exposed or disturbed shall be managed, disposed of, or reused in accordance with these regulations.
- (2) Removal of ACM that is on, or comprises, a facility component, that is located on or in soil that will be disturbed, shall be conducted under this Section 5.5, in accordance with work practices in Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), Section III.V, and is not subject to the permit requirements of 5 CCR 1001-10, Part B, if the total quantity of ACM is below the following trigger levels:
 - (a) 260 linear feet on pipes; or
 - (b) 160 square feet on other surfaces; or
 - (c) The volume of a 55-gallon drum.
- (3) RACS that is generated and not disposed of or reused in compliance with Section 5.5.8 of these regulations is solid waste and shall be managed in accordance with the landfill requirements of the Colorado Solid Wastes Disposal Sites and Facilities Act (C.R.S. 30-20, Part 1) and Sections 5.1 through 5.4 of these regulations.
- (4) Except as provided in Section 5.5.1(D)(5), a person who disturbs or exposes RACS shall make the decision upon the initial discovery of RACS to either manage the RACS in accordance with Section 5.5, or cease soil disturbing activities and permanently stabilize the disturbed or exposed RACS to control the release of asbestos fibers in accordance with one of the following:
 - (a) Cover RACS with geofabric, or equivalent visible and physical barrier, and restore the site to pre-disturbance conditions using fill suitable for unrestricted use; or
 - (b) Cover RACS with geofabric, or other visible and physical barrier, followed by eighteen (18) inches of fill suitable for unrestricted use, and vegetation; or
 - (c) Cover RACS with geofabric, or other visible and physical barrier, followed by six (6) inches of fill suitable for unrestricted use, and concrete or asphalt; or
 - (d) Cover RACS with geofabric, or other visible and physical barrier, followed by fill suitable for unrestricted use to grade for vertical excavation faces or trenches; or
 - (e) Alternate cover designs as approved by the Department.
- (5) RACS that is driven upon is an RWA and shall be kept adequately wet in order to prevent visible emissions from leaving the RWA, or demonstrate that asbestos is

not leaving the RWA above risk based thresholds. All equipment surfaces that have come into contact with RACS shall be decontaminated per Section 5.5.7(l) before leaving the RWA.

5.5.2 EXEMPTIONS

- (A) Removal of ACM on a facility component with asbestos quantities above the trigger levels, as defined in 5.5.1(D)(2), is subject to the permit and abatement requirements of Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), and is therefore not subject to this Section 5.5., but shall still comply with Sections 5.1 through 5.4 of these regulations.
- (B) Spill response activities that are subject to the requirements of Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B) are not subject to the requirements of Section 5.5, but shall still comply with Sections 5.1 through 5.4 of these regulations.
- (C) Ambient occurrences of asbestos fibers in soil that are demonstrated to be the result of background conditions and not the result of site specific activities are not subject to the requirements of this Section 5.5. This background demonstration shall be submitted to, and approved by, the Department prior to the exemption being exercised.
- (D) During active solid waste disposal operations, asbestos waste disposal areas that have a certificate of designation are not subject to Section 5.5, but shall comply with the facility's Engineering Design and Operations Plan.
- (E) De minimis projects involving a total RACS disturbance of less than one (1) cubic yard, utilizing low-emission methods, are exempt from this Section 5.5, except for the decontamination procedures in Section 5.5.7(l) and the disposal requirements in Section 5.5.8.
- (F) Projects conducted directly by a homeowner on their residence not used for the purpose of generating of income, including residential landscaping projects and other private residential soil-disturbing projects conducted after the primary dwelling is built, such as planting trees, digging holes for fence posts, installing sign posts, gardening, other such projects conducted by homeowners on their residence, as described above, are not subject to this Section 5.5, but shall still comply with Sections 5.1 through 5.4 of these regulations.
- (G) Soil disturbing activities involving Non-RACS, where no RACS is present or generated, are not subject to the requirements of Section 5.5, but Non-RACS must be disposed as non-friable asbestos waste in accordance with the disposal requirements set forth in Section 5.2 of these regulations.

- (H) Soil disturbing activities involving debris that only contains metal, glass, plastic, wood, and/or bare concrete with no associated material suspected of being ACM (such as sealants, adhesives, mastics, coatings, adhered materials, or resins), as determined by a CABI, QMP, or generator knowledge, are not subject to the requirements of Section 5.5.
- (I) Soil disturbing activities involving debris that only contains green waste or natural stone are not subject to the requirements of Section 5.5.

5.5.3 TRAINING

- (A) All personnel inside the regulated work area (RWA) during the disturbance of RACS shall have annual awareness training. Except as provided in Section 5.5.3(F), this training requirement also applies to equipment operators and drivers of trucks carrying contaminated material for offsite disposal or reuse. This training shall cover information necessary to comply with Section 5.5 requirements and the approved project specific RACS management plan (PSMRP) or standard operating procedure (SOP) (if any) including:
 - 1) General asbestos awareness; including health effects; and
 - 2) Overview of the requirements of Section 5.5 and its implementation; and
 - 3) Overview of suspect ACM that requires further evaluation by a CABI; and
 - 4) Overview of RACS and Non-RACS; and
 - 5) Worker protection, including respiratory protection. An overview of the levels of personal protective equipment (PPE) required for various activities and conditions; and
 - 6) Decontamination requirements for equipment and personnel including the establishment of decontamination station(s); and
 - 7) Engineering controls in order to prevent visible emissions from leaving the RWA or demonstrate that asbestos is not leaving the RWA above risk-based air thresholds; and
 - 8) Overview of RACS handling procedures.

This training shall be conducted by a CABI who is familiar with the site specific plan and/or the Standard Requirements in Section 5.5.7. Records of this training shall be retained, by the owner/operator, and be available for inspection, for a minimum of one year from the date of the training.

(B) In addition to the annual asbestos awareness training required in 5.5.3(A), all personnel inside the RWA during the disturbance of RACS shall have per-project site-specific awareness training. Except as provided in Section 5.5.3(F), this training requirement also applies to equipment operators and drivers of trucks carrying contaminated material for offsite disposal or reuse. This training shall cover site-specific information necessary to comply with Section 5.5 and the selected management approach for the project (PSRMP, SOPs, or the standard requirements of Section 5.5.7), including:

- 1) An overview of the items from 5.5.3(A) as they pertain to site specific provisions and/or conditions that will affect work practices; and
- 2) Project chain-of-command and identification of authorized personnel with stop work authority, and identification of QPM(s); and
- 3) Hands on training specific to the soil disturbing activities the individual will be performing subject to this Regulation.

This training shall be provided by a CABI who meets the training requirements of 5.5.3(D). Records of this training shall be retained by the owner/operator, and be available for inspection, for the duration of the project for which the training was conducted.

(C) Qualified Project Monitors shall have, at a minimum:

- 1) Annual asbestos awareness training and site specific awareness training under Section 5.5.3(A) and (B); and
- 2) Training from a CABI on identifying debris, exempted materials under Section 5.5.1(A)(3), and the assumption of debris to be RACS as outlined in Section 5.5.1; and
- 3) Training from a CABI on how to implement the standard requirements under Section 5.5.7 and how to perform the duties that a QPM may perform in lieu of a CABI; and
- 4) Training from a CABI on how to implement the provisions of the chosen RACS management approach (PSRMP, SOPs, or standard requirements of Section 5.5.7) and how to perform the duties that a QPM may perform in lieu of a CABI; and
- 5) Forty (40) verifiable hours of direct experience implementing Section 5.5.

Records of this training shall be retained by the owner/operator, and be available for inspection for the duration of the project for which the training was conducted.

- (D) Visual Inspection and identification of RACS shall be conducted by a CABI, with forty (40) verifiable hours of on the job asbestos in soils experience on a minimum of three (3) different asbestos in soils projects, conducted under either AQCC Regulation No. 8 or Section 5.5. The CABI shall be independent of the general contractor (GC) and/or abatement contractor unless the CABI and the GC or abatement contractor are both direct employees of the property owner. However, the GC or abatement contractor may hire a subcontractor CABI, but the CABI shall not be a direct employee of the GC or abatement contractor.
- (E) Air monitoring conducted in accordance with this Section 5.5 shall be performed by an Air Monitoring Specialist (AMS).
- (F) Truck drivers who do not complete the training in 5.5.3(A) and (B) are ancillary workers. Soil disturbing activities must cease if the truck driver is present within the RWA unless the driver remains in the cab of the truck, the truck's windows and doors remain closed, and the air handling system remains off while the truck is inside the RWA.

5.5.4 RESPONSE TO UNPLANNED RACS DISCOVERY

Soil disturbing activities that expose RACS without previously approved plans are subject to the following requirements:

- (A) IMMEDIATE ACTIONS: Immediate actions shall be taken by the person conducting the soil disturbing activity, or representative of the owner or operator, to manage RACS in accordance with Section 5.5 and Section 1.2 definitions of these Regulations. These actions shall include, at a minimum, the following:
 - (1) Stopping all soil disturbing activities related to RACS, until the 24-hour notification requirements in Section 5.5.4(B), and the interim action requirements in Section 5.5.4(C), are met. In the event of an emergency in which a soil disturbing activity must continue or commence at once, notification shall be made as soon as possible, but within 24 hours of identifying or assuming the presence of RACS within the soil disturbing area. During the initial response to the immediate emergency, the standard requirements of Section 5.5.7 shall be implemented to the extent possible. Within 48 hours, any disturbed and/or exposed RACS shall be managed in accordance with the standard requirements of Section 5.5.7, an approved PSRMP, or an approved SOP.
 - (2) Establishing and taking measures in order to prevent access to the RWA by unauthorized persons. Instances of unauthorized access not under the control of the owner/operator shall be evaluated to determine if additional access controls are warranted. The unauthorized access, and the response actions taken, shall be documented and provided to the Department within 48 hours of the incident.

(3) Conducting interim surface soil stabilization to reduce emissions including:

- a. Polyethylene sheeting or geofabric with daily inspection, and inspection after storm events, and repair/replacement of sheeting as necessary to maintain stabilization; or
- b. Chemical stabilizer demonstrated to be effective in the stabilization of RACS (e.g. magnesium chloride) with weekly inspection, and inspection after storm events, and re-application of chemical stabilizer as necessary to maintain stabilization; or
- c. Minimum of three (3) inches of soil appropriate for unrestricted use; or
- d. Other means of stabilization as approved by the Department.
- e. Stabilization is not required if RACS is kept adequately wet. Verification of adequately wet conditions shall be conducted at least every two (2) hours, or RACS shall be stabilized by one of the methods described in (3)(a-d) above.

(B) 24-HOUR NOTIFICATION REQUIREMENTS: The owner/operator, or owner/operator representative shall submit a completed Notification of RACS Disturbance form to the Department's Hazardous Materials and Waste Management Division within 24 hours of identifying RACS during a soil disturbing activity.

(C) INTERIM ACTIONS: In accordance with Section 5.5.5, the owner/operator, or owner/operator representative, shall submit to the Department's Hazardous Materials and Waste Management Division, for review and approval, within five (5) working days of the discovery, a PSRMP, SOPs, or indicate the standard requirements of Section 5.5.7 will be followed on the Notification of RACS Disturbance form submitted to the Department.

(D) Once the requirements of Sections 5.5.4(A), (B), and (C) are completed, any soil disturbing activities shall proceed in accordance with applicable requirements.

5.5.5 RESPONSE TO PLANNED RACS MANAGEMENT

Planned soil disturbing activities involving RACS shall be conducted in accordance with the standard requirements identified in Section 5.5.7, and with one of the following management strategies and the associated notification requirement:

(A) PROJECT SPECIFIC RACS MANAGEMENT PLAN (PSRMP);

- (1) The owner/operator, or owner/operator representative, shall submit a completed Notification of RACS Disturbance form to the Department's Hazardous Materials and Waste Management Division at least ten (10) working days prior to any planned soil disturbing activity. This notification shall include submittal of a PSRMP conforming to the requirements of Section 5.5.5(A)(2). The Department will acknowledge receipt of a notification of the intent to utilize a PSRMP by mail or electronic correspondence. The PSRMP shall be approved by the Department prior to implementation.

(2) If the owner/operator choose(s) management in accordance with this Section 5.5.5(A), a PSRMP shall be developed and submitted to the Department's Hazardous Materials and Waste Management Division for review and approval prior to implementation. The Department will use its best efforts to review and respond to the plan within ten (10) working days of receipt. The PSRMP shall include the following:

- (a) Property representative's name and phone number; and
- (b) Property location; and
- (c) General site description, including a description of RACS and the types of known or assumed ACM(s), and the location(s) of these material on the site; and
- (d) Description of planned soil disturbing activities; and
- (e) Description of site management, emission control activities, and work practices to control the release of, and/or exposure to, asbestos outside of the RWA including:
 - (i) Measures to assure that the soil is adequately wet (as that term is defined in Section 1.2 of these regulations), stabilized, or covered during soil disturbing activities; and
 - (ii) Wind speed monitoring during RACS disturbance, including frequency of monitoring, and shutdown and start up criteria; and
 - (iii) An air monitoring plan designed to detect asbestos at the perimeter of the RWA as an indication that the measures to control the release of asbestos outside of the RWA are effective. The plan may include a tiered air monitoring approach providing less frequent air monitoring given demonstrated effectiveness of work practices; and
 - (iv) Work practices specific to mechanical and/or hand disturbance of RACS including measures in order to prevent the release of visible emissions outside of the RWA, or demonstrate that asbestos is not leaving the RWA above risk-based air thresholds; and
 - (v) Work practices for the loading and placement of RACS including spill prevention procedures.
 - (vi) The owner /operator has the option to erect a structure maintained at a negative pressure differential sufficient to contain all dust, with off-gas from the evacuation system treated with HEPA filtration. If this option is chosen, the requirement to submit an air monitoring plan, under Section 5.5.5(A)(2)(e)(iii) is not applicable.

and

- (f) Description and location of any planned sampling. All sampling shall be performed in accordance with the procedures set forth in Appendix 5A. All investigation derived waste shall be managed in accordance with Section 5.5.8.

- (3) A copy of the PSRMP shall be maintained on the site during RACS disturbing activities.
- (4) At the option of the owner/operator and upon notice to the Department, a Soil Characterization and Management Plan approved prior to the effective date of this amended Section 5.5, and that complies with the substantive requirements of the regulation prior to amendment, shall remain in effect until the completion of the subject project or until it is replaced by a PSRMP.

(B) STANDARD OPERATING PROCEDURES (SOPs)

- (1) The owner/operator, or owner/operator representative, shall notify the Department's Hazardous Materials and Waste Management Division, by submitting a completed Notification of RACS Disturbance form, prior to implementation of the previously approved SOPs at a RWA. SOPs that conform to Section 5.5.5(B)(2) shall be approved by the Department prior to implementation. The Department will acknowledge receipt of a notification of the intent to utilize an SOP by mail or electronic correspondence.
- (2) If the owner/operator chooses management in accordance with this Section 5.5.5(B), the owner/operator shall develop and submit to the Department's Hazardous Materials and Waste Management Division, for review and approval, thirty (30) calendar days in advance of any RACS disturbing activities, SOPs that conform with Section 5.5.5(A)(2)(a) – (f) that will be implemented, upon notice to the Department per Section 5.5.5(B)(1), at future RWA(s). A copy of the SOPs shall be maintained on site during RACS disturbing activities for the duration of the Project.
- (3) At the option of the owner/operator and upon notice to the Department, a SOP approved prior to the effective date of this amended Section 5.5, and that complies with the substantive requirements of the regulation prior to amendment, shall remain in effect and may be used to comply with the amended regulation.

(C) STANDARD REQUIREMENTS OF SECTION 5.5.7

The owner/operator, or owner/operator representative, shall submit to the Department's Hazardous Materials and Waste Management Division a completed Notification of RACS Disturbance form indicating the intent to utilize the standard requirements of Section 5.5.7, as a default RACS management plan, prior to any planned soil disturbing activity. This notification shall include property location, general site description, and contact information for the owner/operator responsible for the RWA activities. The Department will acknowledge receipt of a notification of the intent to utilize the standard requirements of Section 5.5.7 by mail or electronic correspondence.

(D) RISK BASED APPROACH

The owner/operator may choose to submit, for Department review and approval, a site-specific risk assessment work plan to evaluate the risks of the proposed work practices associated with planned disturbance activities in an area or areas of RACS.

5.5.6 REMEDIATION OF ASBESTOS IN SOIL

- (A) Remediation is not required of properties at which ACM, RACS, or asbestos waste is located. If the owner of a property chooses to remediate (rather than just manage) all or a portion of the property containing ACM, RACS, or asbestos waste a Remediation Plan shall be submitted to the Department's Hazardous Materials and Waste Management Division for review and approval prior to commencement of activities associated with the remediation. The Remediation Plan shall comply with this Section 5.5, and include the following:
- (1) The standard requirements in accordance with Section 5.5.7, and the plan requirements outlined in Section 5.5.5(A). Alternatively, a risk based approach pursuant to Section 5.5.5(D) may be proposed, for Department review and approval, for disturbance of RACS; and
 - (2) A detailed description of planned remediation activities, including proposed depth and areal extent of remediation, and work practices to be implemented; and
 - (3) The proposed use of the property and area of remediation; and
 - (4) Any planned engineering or institutional controls in order to prevent exposure to any asbestos left in place, or minimize exposure below a risk-based concentration approved by the Department, within the area covered by the Remediation Plan, and
 - (5) A schedule for submittal of a Remediation Completion Report that incorporates the information from Section 5.5.7(L) and any additional information necessary to demonstrate that the remediation goals have been achieved.
- (B) The Department shall use its best efforts to provide written notification that a Remediation Plan has been approved or disapproved within no more than forty-five (45) calendar days after a request by a property owner, unless the property owner and the Department agree to an extension of the review to a date certain.
- (C) If a remedial decision is made by the Department, the area subject to the remedial decision may be subject to C.R.S. Section 25-15-320(2), and an environmental covenant may be required for waste left in place.

5.5.7 STANDARD REQUIREMENTS FOR THE DISTURBANCE OF RACS

The requirements of this section, if followed in their entirety, constitute a default RACS management plan, eliminating the need to submit a PSRMP or SOP.

(A) ESTABLISHMENT AND CONTROL OF A REGULATED WORK AREA (RWA)

(1) Requirements for establishment and control of a RWA applicable to all projects subject to this Regulation:

- (a) Establish a RWA which is identifiable to all persons. Haul roads between RWAs, where RACS is not present, are considered to be outside the RWA(s); however, equipment decontamination [Section 5.5.7(I)] and spill response procedures [Section 5.5.7(J)] shall be followed; and
- (b) Stop all soil disturbing activities in the RWA if ancillary workers or members of the public are present within the RWA. Truck drivers who do not complete the training under Sections 5.5.3(A) and (B) are ancillary workers. Soil disturbing activities must cease if the truck driver is present within the RWA unless the driver remains in the cab of the truck, the truck's windows remain closed, and the air handling system remains off while the truck is inside the RWA; and
- (c) Post labeling and signage to demarcate RWA(s). The RWA shall be demarcated by visible means that fully defines the extent of the RWA. Labeling and signage shall indicate the presence of asbestos, and that the area is off limits to unauthorized personnel.

(2) **Additional Requirement for Projects Disturbing RACS Containing Friable ACM.** Establish a secured work site (e.g., fencing with locks/zip-ties/chains). Personnel, or staff assigned to this duty, may be used to secure the RWA in lieu of fencing. If the RWA is located within a larger secure facility, fencing of the RWA is not necessary as long as the RWA is secured.

(B) PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR THE PURPOSES OF PREVENTING CROSS-CONTAMINATION

(1) Requirements applicable to all RWAs subject to this Regulation:

- (a) Use of disposable booties or impermeable footwear that will be decontaminated per Section 5.5.7(I); and
- (b) Use of disposable gloves or impermeable gloves that will be decontaminated per Section 5.5.7(I); and
- (c) Replace or decontaminate (per Section 5.5.7(I)) all PPE in all instances where the integrity of the PPE is compromised, and when workers exit the RWA; and
- (d) Decontaminate (per Section 5.5.7(I)) or dispose of all used PPE as asbestos contaminated waste.

- (2) **Additional Requirement Applicable to Projects at RWAs Containing Friable ACM.** Use of disposable impermeable suits or equivalent coveralls, remove suits or coveralls upon exiting the RWA, and dispose of used suits or coveralls as asbestos contaminated waste.

(C) WETTING

- (1) Wetting requirements applicable to all RACS disturbance:

- (a) Adequately wet all RACS and soils, or other materials containing RACS, on the surface and in the sub-surface prior to and during RACS disturbance, except as provided in Section 5.5.7(F)(1)(b)(ii). Pre-wetting is not necessary if soils are already adequately wet. Apply water or amended water (as required in Section 5.5.7(C)(2)) at low pressure in order to minimize dust generation and splattering to prevent visible emissions from leaving the RWA, or demonstrate that asbestos is not leaving the RWA above risk-based thresholds.
- (b) Mist RACS and soils, or other materials, containing RACS during placement as needed to maintain the material in an adequately wet condition using equipment mounted spray bars, or additional hose operator(s).
- (c) Except as provided in (d) below, incidental occurrences of visible emissions leaving the RWA shall be managed by evaluating site conditions and engineering controls for each occurrence of visible emissions, and immediately implementing any identified engineering control revisions necessary in order to prevent future occurrences of visible emissions. All instances of visible emissions leaving the RWA shall be documented as required in Section 5.5.7(L) of this regulation.
- (d) When utilizing the risk-based air monitoring threshold approach to evaluate the effectiveness of adequately wetting, visible emissions are allowed to leave the RWA as long as the risk-based air threshold is not exceeded.

- (2) **Additional requirement for RACS that contains friable ACM.** Use amended water containing a wetting agent, such as a 50:50 mixture of polyoxyethylene ester and polyoxyethylene ether, or the equivalent, in a 0.16 percent solution (1 ounce to 5 gallons) of water, or as per manufacturer recommendations for the wetting of asbestos. This requirement may be waived by the Department for emergency situations where the work must occur immediately and wetting agents are not available.

(D) WIND SPEED MONITORING

- (1) Requirements applicable to all projects involving mechanical disturbance of RACS, and hand disturbance of RACS containing friable ACM:

- (a) Take wind measurements from within the RWA using a hand held anemometer. Alternatively, or in conjunction with hand held measurements, an onsite weather station may be used within a quarter mile of the RWA as long as the conditions measured by the weather station are representative of conditions in the RWA.
 - i. Collect wind speed measurements at a minimum of thirty (30) minute intervals and during wind gust(s). Average wind speed measurements shall be obtained manually by taking ten readings at one minute intervals and averaging the ten readings, or through the use of instrumentation that provides a ten minute average wind speed reading.
 - ii. If wind break barriers are used, wind speed measurements may be taken from within barriers; however, wind speed measurements shall also be taken outside the wind break barriers if any RACS disturbing activities, such as loading, are taking place outside or above the barriers. Wind speed shut-down criteria shall be based on measurements taken that are representative of the area of active RACS disturbance.
- (b) Immediate stoppage of all RACS disturbance shall occur based on results of wind speed monitoring conducted in accordance with subsection (a) and exceedance of the following criteria:
 - i. Wind gust(s) in excess of 20 mph, or
 - ii. Sustained winds in excess of 12 mph, averaged over ten (10) minutes, or
 - iii. Winds are interfering with the ability of engineering controls to work as intended, or
 - iv. Winds are creating visible emissions that leave the RWA.
- (c) RACS disturbance may resume when all of the following criteria are met:
 - i. No gust(s) in excess of 20 mph occur for twenty (20) minutes, and
 - ii. No sustained winds in excess of 12 mph occur for twenty (20) minutes, based on a ten (10) minute average wind speed measurement, and
 - iii. Winds are not interfering with the ability of engineering controls to function as intended, and
 - iv. Winds are not creating visible emissions that leave the RWA.

(E) AIR MONITORING

- (1) If using the risk-based air threshold approach to monitor the effectiveness of adequately wetting:
 - (a) Air monitoring to determine asbestos content of visible emissions allowed to leave the RWA, for comparison to the risk-based air thresholds shall not be utilized for projects that are less than ten (10) days in duration.

- (b) Air monitoring to determine asbestos content of visible emissions allowed to leave the RWA, for comparison to the risk-based air thresholds, shall begin on the first day of the project.
 - (c) A minimum of four (4) air samples per day shall be collected for TEM analysis.
 - (d) Sample collection, analysis, and data evaluation shall be conducted in accordance with Appendix 5A.
- (2) If preventing visible emissions leaving the RWA as an indication of the effectiveness of work practices, not for risk evaluation, air monitoring is required during mechanical disturbance of RACS in RWAs with an adjacent receptor zone:
- (a) No air monitoring is required for RACS disturbance that will not exceed a duration of two (2) days. However, the requirements for adequate wetting (Section 5.5.7(C)) and no visible emissions leaving the RWA (Section 5.5.7(F)) shall be adhered to on all RACS disturbance projects. Dividing projects into multiple two (2) day or shorter components shall not be used as a mechanism to avoid air monitoring requirements.
 - (b) Area monitoring shall consist of a minimum of four (4) samples collected on the perimeter of the RWA at appropriate intervals to provide representative information regarding potential releases of asbestos fibers to the adjacent receptor zone(s). Additional samples shall be collected for large perimeter RWAs (greater than one (1) acre). RWAs greater than one (1) acre shall require additional perimeter monitoring points be added at a rate of one (1) sample for every 200 linear feet (or approximately each additional ¼ acre). If representative information about potential releases to the adjacent receptor zone(s) can be collected using less than the minimum number of samples, the remaining sample locations shall be at the discretion of the AMS.
 - (c) Phase Contrast Microscopy (PCM) analysis is required on all samples collected (unless all samples will be analyzed by Transmission Electron Microscope (TEM) by default). The laboratory shall be requested to provide verbal results to the AMS or the QPM by the start of the next working day, or as soon as possible after the start of the next working day, with written results within 24 hours of the receipt of verbal results. A consultation with the Department is required If this timeframe cannot be met by the laboratory.
 - (d) Upon receipt of a laboratory report indicating a “cannot be read (CBR)”, or a “not analyzed (NA) or rejected” due to loose debris or uneven loading, analysis result:
 - i. The AMS shall evaluate the lab report and any field documentation to determine a possible cause for the CBR or “not analyzed (NA) or rejected” result; and

- ii. If the CBR or “not analyzed (NA) or rejected” cannot be correlated to a specific field event that compromised the sample (e.g. the sample was blown over, the filter of the sample was sprayed with water) then the sample shall be prepared for indirect TEM presence/absence analysis to determine potential asbestos content in accordance with Appendix 5A; and
 - iii. If the CBR or “not analyzed (NA) or rejected”, analysis result can be correlated to a compromised sample, then preparation for indirect TEM presence/absence analysis is not required as long as adequate air monitoring data is available to evaluate the effectiveness of engineering controls. However, overloading of a sample with particulate matter does not constitute a compromised sample, and will require indirect preparation for TEM presence/absence analysis; and
 - iv. Field personnel shall evaluate why the sample was compromised and modify field procedures as necessary to avoid future samples from being compromised; and
 - v. The Department project manager shall be notified by phone or email of instances of CBR or “not analyzed (NA) or rejected” analysis results within 24 hours of receipt of verbal results.
- (e) TEM presence/absence analysis is required (analysis providing fiber counts/concentrations is always optional) as described in paragraphs (i) through (iv) below. The laboratory shall be requested to provide verbal results by the start of the next working day, or as soon as possible after the start of the next working day, with written results within 24 hours of the receipt of verbal results.
- i. All samples, required by this Section 5.5, with PCM results having fiber concentrations greater than 0.01f/cc shall be submitted for TEM analysis.
 - ii. During the first five (5) days of RACS disturbance – A minimum of 25% of the samples collected from each RWA, inclusive of the downwind floating samples as described in 5.5.7(E)(2), shall be submitted for TEM analysis. The sample(s) selected for TEM analysis shall have the highest PCM result(s) based on fiber concentration. If all PCM results are Below Detectable Limit (BDL) for fiber concentration, then the sample(s) selected for TEM analysis shall be determined by highest fiber count. If all samples have no fiber counts (i.e. zero (0) fibers counted, not a “below detection limit” fiber concentration) then no TEM analysis is required.
 - iii. After five (5) days of RACS disturbance with no asbestos detections by TEM analysis, the frequency of analysis by TEM, on the highest 25% of PCM results(s), may be reduced to once every five (5) days of RACS disturbance, or portions thereof, using the same selection criteria as in paragraphs (i) and (ii) above. The samples submitted for TEM analysis during the period of reduced frequency TEM analysis shall be either the first occurrence of: 1) high winds exceeding wind shut down criteria, or 2) visible emissions. In the absence of high wind events or visible emissions

the selected day for TEM analysis may be random, as determined by the AMS.

- iv. If there are any asbestos detections during the random once every five (5) days of RACS disturbance analysis by TEM, then TEM analysis shall be conducted for the next three (3) consecutive days of RACS disturbance, or portions thereof, using the same procedures as in paragraph (i) and (ii) above. If there are no additional asbestos detections during the next three (3) consecutive days of RACS disturbance with samples submitted for TEM analysis, then the frequency of TEM analysis may return to random once every five (5) days of RACS disturbance.
 - v. If site conditions, friability of the materials being managed, or work practices change, then the initial five (5) days of TEM analysis shall restart using the provisions set forth in this Section 5.5.7(E)(1)(e).
- (f) Detection or presence responses - For each detection of asbestos by TEM analysis, the following shall be conducted:
- i. Notify the Department project manager by phone or email, on the same calendar day as receipt of verbal or written results (whichever comes first) from the laboratory.
 - ii. Evaluate site conditions and engineering controls for each detection, and immediately implement any identified engineering control revisions necessary with the goal of preventing future detections of asbestos fibers.
 - iii. Submit an Emission Control Plan (ECP) to the Department project manager for each detection (days with multiple detections can be addressed by a single ECP). The ECP shall be submitted within 48 hours from the asbestos detection event and shall contain:
 - 1. The date of the detection.
 - 2. A written description of sample details (sample ID, number of structures detected, type of asbestos detected, PCM analytical result) and any potential cause of the release. Include a description of site activity (engineering controls being employed, equipment being used, size of excavation/soil disturbing activity, types of materials identified, etc.) and CABI observations at the work area before and during the presumed time of release.
 - 3. A diagram or write up of all air sample positions clearly indicating which sample received the TEM detection. Indicate, through illustration or description, prevailing wind direction and average wind speeds for the detection event; include any wind speed shutdowns for the date of detection. If applicable, indicate downwind floater air sample relocation times and new positions through illustration or description.
 - 4. Laboratory reports confirming the type and amount of fibers detected by TEM analysis.

5. Other pertinent information that will additionally describe the release and/or will assist in the prevention of future releases from the RWA.
6. A written description of actions taken and any other proposed actions with the goal of preventing future releases from the RWA.
7. If the owner/operator believes fibers are coming from offsite and are not under the control of the owner/operator, then, in addition to the information provided in the ECP, documentation shall be provided demonstrating additional sources of asbestos fibers.

(g) If there are three (3) TEM detections on consecutive analysis events or ten (10) detections for a single project, consultation with the Department is required to determine if the standard requirements of Section 5.5.7 are being implemented appropriately and whether:

- i. Changes in the standard requirements of Section 5.5.7 are likely to prevent future releases; or
- ii. Changes in the standard requirements of Section 5.5.7 are not likely to prevent future releases and a PSRMP is necessary per Section 5.5.5(A)(2); or
- iii. If the owner/operator believes fibers are coming from offsite and are not under the control of the owner/operator, then, in addition to the information provided in the ECP, documentation shall be provided demonstrating additional sources of asbestos fibers. Air samples shall be collected and analyzed following the analytical procedures of Appendix 5A for the type of project being conducted; and
- iv. Additional consultation with the Department is required to determine whether additional engineering controls for structures within the adjacent receptor zone are appropriate.

(3) **Additional requirement for projects disturbing RACS containing friable ACM.** Collect two (2) additional downwind floating samples for mechanical disturbance of RACS containing friable ACM. The samplers shall be moved based on prevailing wind direction and adjacent receptors. For example, if adjacent receptors are present on only one side of the RWA, one sample location should be maintained between the RWA and the adjacent receptor.

(F) WORK PRACTICES TO BE FOLLOWED DURING RACS DISTURBANCE

(1) Work practice requirements applicable to all management of RACS:

(a) Prevent visible emissions from leaving the RWA, or demonstrate that asbestos is not leaving the RWA above risk based thresholds by:

- i. Excavating in lifts not to exceed the extent of wetting; or

- ii. Conducting continuous wetting while mixing dry materials at the point of RACS disturbance to ensure all materials are adequately wet prior to removal from the excavation.
 - iii. Instances of visible emissions leaving the RWA shall be documented and addressed by changing or increasing controls (e.g. more effective wetting, reduced speed of excavation).
- (b) RACS on exposed excavation faces that will be disturbed and/or managed during the project shall either be kept adequately wet (in accordance with Section 5.5.7(C)), or be stabilized using any of the following in order to prevent visible emissions from leaving the RWA, or demonstrate that asbestos is not leaving the RWA above risk based thresholds:
- i. Polyethylene sheeting or geofabric with daily inspection, and inspection no later than twelve (12) hours following a storm event, and repair/replace sheeting as necessary to maintain stabilization; or
 - ii. Chemical stabilizer demonstrated to be effective in the stabilization of RACS (e.g. magnesium chloride) with weekly inspection, and inspection no later than one (1) calendar day following a storm event, and re-application of chemical stabilizer as necessary to maintain stabilization; or
 - iii. Minimum of three (3) inches of soil appropriate for unrestricted use.
- (c) Stormwater shall be managed in accordance with the Water Quality Control Commission's stormwater regulations (5 CCR 1002-61), which include specific stormwater permitting and management requirements for construction sites. The Water Quality Control Division should be contacted to determine the specific requirements for each project. Stormwater shall be managed in a manner that minimizes run on and runoff from RACS. Stormwater that comes into contact with RACS shall be treated as asbestos contaminated water in accordance with Section 5.5.7(J)(4), and other material(s) impacted by asbestos contaminated stormwater shall be managed as RACS in accordance with Section 5.5.7(J)(3).
- (2) Work Practice requirements applicable to the management of RACS using hand methods on surfaces or in the subsurface:
- a. Wet and remove the RACS and six (6) inches, in all directions, of surrounding soil or other material from the last occurrence of visible ACM; and
 - b. A CABI shall confirm that the visible extent of ACM and surrounding soil, or other material, has been removed (or extent of excavation has been reached). If RACS remains, it shall be managed for stabilization or future removal. If there is no documented evidence of non-visible RACS at the site, then a visual inspection and clearance shall be sufficient to determine the removal of RACS. If there is documented evidence of non-visible

RACS at the site, sampling is required to confirm the removal of RACS. After the removal of the additional six (6) inches, and in the absence of any debris, a QPM may make the determination that RACS has been removed; and

- c. If RACS remains in the RWA, it shall be managed for stabilization, per Section 5.5.7(K), or future removal.
- d. In lieu of stabilization or full removal, sampling may be performed per Section 2.2 of Appendix 5A to demonstrate that the material is not RACS.
- e. Dispose of RACS in accordance with Section 5.5.8.

(3) Work practice requirements applicable to management of RACS using mechanical methods:

- a. For surface occurrence of RACS - Wet and remove all RACS and a minimum of six (6) inches of soil, and/or other matrix material, in all directions from the last occurrence of visible ACM, with CABI confirmation that the visible extent of RACS has been removed.
- b. For subsurface occurrence of RACS - Wet and remove all RACS and a minimum of three (3) linear feet of soil or other matrix material, in the direction(s) of planned excavation, with CABI confirmation that the visible extent of RACS has been removed. If there is no documented evidence of non-visible RACS at the site, then a visual inspection and clearance shall be sufficient to determine the removal of RACS. If there is documented evidence of non-visible RACS at the site, sampling is required to confirm the removal of RACS. After the removal of the additional three (3) linear feet, and in the absence of any debris, a QPM may make the determination that RACS has been removed.
- c. If RACS remains in the RWA, it shall be managed for stabilization, per 5.5.7(K), or future removal.
- d. In lieu of stabilization or full removal, sampling may be performed per Appendix 5A to demonstrate that the material is not RACS.
- e. Package and dispose of RACS in accordance with Section 5.5.8.

(4) Soil or other matrix material that remains after removal of RACS in accordance with Section 5.5.7(F), Section 5.5.7(H)(1)(c)(i), or an approved plan, is not considered RACS, is not subject to Section 5.5, and may be appropriate for unrestricted use, onsite or offsite, as long as it does not contain any other regulated material.

(G) LOADING AND PLACEMENT OF RACS

(1) Requirements for the loading of RACS:

- (a) Protect clean surfaces (including loading surface and truck or disposal container surfaces that may come in contact with RACS) by covering or decontamination of surfaces prior to transport or removal of the truck or disposal container from the RWA and/or loading zone.
- (b) Spill prevention shall consist of:
 - i. Minimization of spillage by not overfilling the excavator or loader bucket and returning the bucket to a closed position prior to moving from the loading point; and
 - ii. Replacement of protective coverings when worn or damaged in order to prevent breaches; and
 - iii. Control of runoff in order to prevent cross contamination from water containing asbestos; and
 - iv. Mitigation of spills of RACS in accordance with Section 5.5.7(J).
- (c) During the process of loading the container, the equipment operator shall lower the bucket as close as possible to the interior of the container before dumping, and dump the load slowly to allow adequate misting and in order to prevent visible emissions from leaving the RWA, or demonstrate that asbestos is not leaving the RWA above risk based thresholds.

(2) Requirements for the transportation of RACS:

- (a) Onsite transportation of RACS between the RWA and an onsite area of staging, stockpiling, storage, disposal or reuse shall comply with the following:
 - i. The packaging requirements for RACS set forth in Section 5.5.8(A) of these regulations are not applicable; however, the decontamination requirements of Section 5.5.7(I) shall be followed at the end of disposal operations, or before disposal equipment is removed from the site; and
 - ii. Driving speeds shall not exceed 12 miles per hour or RACS shall be covered during transport; and
 - iii. For transportation between the RWA and a non-contiguous onsite staging, stockpiling, storage, disposal, or reuse area:
 - 1. Transportation equipment tires shall not contact RACS; or
 - 2. RACS that is driven upon is a RWA and shall be kept adequately wet in order to prevent visible emissions from leaving the RWA, or demonstrate that asbestos is not leaving the RWA above risk based thresholds, and all equipment surfaces that have come into contact

with RACS shall be decontaminated per Section 5.5.7(I) before leaving the RWA; or

3. The haul road shall be managed as RACS for stabilization, per Section 5.5.7(F)(1), and future removal of a minimum of three (3) inches of soil, or other matrix material. If the road is constructed of a durable surface such as concrete or asphalt, the surface shall be decontaminated in accordance with Section 5.5.7(I)(1)(b) using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.

(H) ONSITE STAGING, STOCKPILING, AND STORAGE OF RACS

- (1) Staging, as defined in Section 1.2 of these regulations, is the accumulation and temporary storage of RACS in the RWA for 12 hours or less. The following requirements shall apply to the staging of RACS:
 - (a) Staged RACS shall be kept adequately wet.
 - (b) Staging of RACS shall be on 6 mil, or greater, polyethylene sheeting or shall include removal, and management as RACS, of a minimum of three (3) inches of material, from below the staging pile/area prior to demobilization; with visual or measured confirmation of removal. If polyethylene sheeting is placed on top of a durable surface such as concrete or asphalt, the surface must be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
 - (c) Material determined to be clean during generation shall be inspected during placement for staging. Staging of clean material with incidental discovery of RACS shall be managed as follows:
 - i. If a CABI was continually inspecting the material during generation, remove the piece of ACM and one (1) foot of material in all directions, with CABI confirmation that the visible extent of RACS has been removed. If more than one (1) piece of ACM, or a pocket of ACM is discovered, remove the pocket of ACM plus one (1) foot of material in all directions, with CABI confirmation that the visible extent of RACS has been removed. Material that remains after removal of RACS, and CABI visible confirmation, is not considered RACS, is not subject to Section 5.5, and

may be appropriate for unrestricted reuse, onsite or offsite, as long as it does not contain any other regulated material.

- ii. If a CABI was not continually inspecting the material during generation, an intrusive inspection of the pile shall be conducted to determine the extent of RACS contamination, followed by the removal of the visible extent of contamination plus removal of one (1) foot of material in all directions. Alternatively, the entire pile, plus three (3) inches of material below the pile, shall be removed and managed as RACS. If the pile was placed on top of a durable surface such as concrete or asphalt, the surface shall be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
- (2) Stockpiling, as defined in Section 1.2 of these regulations, is the accumulation and storage of RACS that will exist for more than twelve (12) hours, up to and including ten (10) calendar days. The following requirements shall apply to stockpiled RACS:
- (a) Stockpiled RACS shall be placed on a minimum of 6 mil polyethylene sheeting or shall include removal, and management as RACS, of a minimum of three (3) inches of soil, or other matrix material, from under the entire area of RACS stockpiling after stockpile removal. If the stockpile was placed on top of a durable surface such as concrete or asphalt, the surface must be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
 - (b) RACS shall be adequately wet during disturbance.
 - (c) Stockpiled RACS shall be controlled per Section 5.5.7(A).
 - (d) Stockpiled RACS shall be stabilized by:
 - i. Polyethylene sheeting or geotechnical fabric with daily inspection, and inspection no later than twelve (12) hours following storm events, and repair/replace sheeting as necessary to maintain stabilization; or
 - ii. Chemical stabilizer demonstrated to be effective in the stabilization of RACS (e.g. magnesium chloride) with weekly inspection, and inspection no later than one (1) calendar day after storm events, and re-application of chemical stabilizer as necessary to maintain stabilization; or

- iii. Minimum of three (3) inches of soil appropriate for unrestricted use.
- (e) For stockpile areas that are non-contiguous with the RWA, transportation of RACS shall be conducted in accordance with the following:
- i. Transportation equipment tires shall not contact RACS; or
 - ii. The tires shall be decontaminated per Section 5.5.7(I) before leaving the RWA; or
 - iii. The haul road shall be managed as RACS for stabilization, per Section 5.5.7(H)(2)(d), and future removal of a minimum of three (3) inches of soil, or other matrix material. If the road is constructed of a durable surface such as concrete or asphalt, the surface shall be decontaminated using wet methods, followed by CABI inspection verifying that all soil and debris has been removed from the surface. Rinsate/runoff shall be collected and filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
- (f) For a stockpile that was previously thought to be free of RACS, but where RACS is subsequently identified, the procedure outlined in Section 5.5.7 (H)(1)(c) shall be followed.
- (3) Storage of RACS exceeding ten calendar days shall require the submission of a RACS Storage Plan. Storage of RACS shall not commence prior to approval of the RACS Storage Plan by the Department's Hazardous Materials and Waste Management Division. The RACS Storage Plan shall include:
- (a) Approval of storage with signature from the property owner; and
 - (b) Volume of RACS intended for storage; and
 - (c) Liner design or provisions for removal of a minimum of three (3) inches of underlying material; and
 - (d) Storm water design including protections for run-on and run-off; and
 - (e) Cover design or use of an equivalent durable stabilizer; and
 - (f) Access control and signage; and
 - (g) Storage timeframe (shall not exceed six (6) months unless an extended storage timeframe is approved by the Department and complies with local governing authority requirements); and
 - (h) Inspection and maintenance schedule; and

- (i) Closure and removal requirements; and
 - (j) Documentation and reporting; and
 - (k) Certification of any designed elements by a Colorado registered Professional Engineer.
- (4) Temporary sub-surface storage of RACS in areas of future planned RACS removal shall not exceed six (6) months and shall comply with the following:
- (a) RACS may only be placed within the Area of Contamination (AOC) that it was originally removed from.
 - (b) Placement of RACS utilizing standard RACS management requirements in accordance with the standard requirements of Section 5.5.7, an approved PSRMP, or an approved SOP.
 - (c) Cover RACS in accordance with the requirements of Section 5.5.7(K).
 - (d) RACS not removed within six (6) months (unless an extended storage timeframe is approved by the Department), shall be considered disposal in accordance with Section 5.5.8(A), or reuse within an AOC and will require an environmental covenant in accordance with Section 5.5.8(B)(1).
- (5) Offsite staging, stockpiling, and storage of RACS are allowed as long as they comply with the disposition requirements of Section 5.5.8.

(I) DECONTAMINATION

(1) Requirements applicable to all projects subject to Section 5.5:

(a) Personnel Decontamination:

- i. Remove booties and/or gloves before exiting RWA and dispose as asbestos contaminated waste; or
- ii. If not using disposable PPE, decontaminate boots in a boot wash station, remove gloves after exiting the boot wash station, and dispose of gloves as asbestos contaminated waste. Rinsate from the boot wash station shall be collected, filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility, or re-applied to RACS that will be managed under these regulations.

(b) Decontamination of Equipment or Surfaces that have come into Contact with RACS

i. For equipment that comes into contact with RACS:

1. Wet decontamination on a decontamination pad (minimum 10 mil poly or other durable non-permeable barrier) followed by CABI inspection and verification of equipment decontamination before it leaves the decontamination area. All decontamination liquids and solids shall be contained, and run-on and run-off shall be prevented. Rinsate/runoff shall be collected, filtrated to less than 5 microns (or applicable local requirements) and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations. For breaches in the decontamination pad where RACS or water contaminated with asbestos may have impacted the material below the decontamination pad, implement the provisions of Section 5.5.7(J);

and/or

2. Decontamination using HEPA vacuums followed by CABI inspection and verification of equipment decontamination before it leaves the decontamination area.

(c) Protection of Clean Equipment and Surfaces:

- i. Keep all equipment off of RACS; or
- ii. Protect clean surfaces from coming in contact with RACS by covering equipment surfaces or RACS surfaces with polyethylene sheeting or equivalent durable impermeable covering. For onsite movement of excavation equipment between RWAs, where only the excavator bucket has come in contact with RACS, the bucket shall be wrapped in polyethylene sheeting (minimum 6 mil) prior to movement. Protective coverings shall be cleaned, repaired, or replaced as necessary. If protective coverings are breached and RACS or asbestos contaminated water comes into contact with underlying material, the provisions of Section 5.5.7(J) shall be followed. Coverings that have come in contact with RACS shall be disposed as asbestos contaminated waste.

(2) Additional Requirements for Projects Disturbing RACS Containing Friable ACM:

- (a) Remove disposable impermeable suits or equivalent coveralls before exiting RWA and dispose as asbestos contaminated waste, or
- (b) After removal of suits or coveralls, conduct full wet decontamination prior to exiting RWA with collection of rinsate and filtration to less than 5 microns and

discharge to a sanitary sewer or other Department-approved disposal facility.
Re-application of decontamination shower water is prohibited.

(J) RACS SPILL RESPONSE

- (1) Areas where RACS is spilled are RWAs until clean up is completed.
- (2) Spilled material shall be cleaned up immediately and not allowed to dry out or accumulate on any surface. The Department's Hazardous Materials and Waste Management Division shall be notified, through the spill reporting hotline, in the event that spills of RACS cannot be cleaned up within 24 hours of spill identification.
- (3) Where there are breaches in ground coverings that have the potential to allow RACS or water contaminated with asbestos to impact the material below the covering, a minimum of three (3) inches of soil, or other matrix material, shall be removed from beneath the breached ground coverings. Visual or measured (e.g. survey) confirmation that three (3) inches of soil and/or other matrix material from beneath the breached covering has been removed shall be conducted. If ground coverings are placed on top of a durable surface such as concrete or asphalt, the surface shall be decontaminated using wet methods, followed by CABI inspection that all soil and debris has been removed from the surface.
- (4) Rinsate, runoff, or any other water that has come into contact with RACS shall be considered to be asbestos contaminated water and shall be collected and filtrated to less than 5 microns and discharged to a sanitary sewer or other Department-approved disposal facility or re-applied to RACS that will be managed under these regulations.
- (5) Surfaces that are contacted by asbestos contaminated water shall be managed as RACS as per Section 5.5.7(J)(3) or permanently stabilized as per Section 5.5.7(K).
- (6) If work practices in an RWA are causing an ongoing spill outside the RWA, the work practices shall cease or be modified to prevent additional releases.

(K) REQUIREMENTS FOR EXPOSED RACS REMAINING IN PLACE

- (1) Any remaining RACS that has been exposed by the soil disturbing activity, but is not disturbed, such as an excavation side-wall or bottom shall be covered or stabilized using one of the following:
 - (a) Cover RACS with geofabric, followed by eighteen (18) inches of fill suitable for unrestricted use, and vegetation; or

- (b) Cover RACS with geofabric, followed by six (6) inches of fill suitable for unrestricted use, and concrete or asphalt; or
- (c) Cover RACS with geofabric, followed by fill suitable for unrestricted use to grade or six (6) inches, whichever is greater, for vertical excavation faces or trenches; or
- (d) Alternate cover designs as approved by the Department.

(L) DOCUMENTATION

(1) The documents listed below shall be maintained during a project and available for Department review upon request. However, this documentation need not be submitted to the Department unless requested. CABI and AMS notes may be collected by one individual if they possess both certifications; however, if no AMS is onsite the CABI shall provide items listed in the AMS notes section (e.g. wind monitoring and shutdown events). CABI and AMS notes may be taken by another individual, but shall be reviewed, approved, and signed by the CABI or AMS for whom the notes are being taken. Other appropriate personnel may also provide the following documentation.

(a) CABI/QPM Notes shall include documentation of:

- i. Site description including location; and
- ii. Descriptions of site activities; and
- iii. Descriptions of equipment in use; and
- iv. Descriptions of hand removals (including locations); and
- v. Descriptions of types of debris identified; and
- vi. Descriptions of suspect material identified; and
- vii. Friability of ACM identified (as determined by a CABI); and
- viii. Sampling, if conducted (all sampling shall be conducted by a CABI); and
- ix. Decontamination visual inspection and clearances; and
- x. Excavation visual inspection and clearances; and
- xi. Spill response activities; and
- xii. Observations of visible emissions and responses; and
- xiii. Observations of non-earthen material or the appearance of fill; and
- xiv. Observations of other indicators of impact to soils.

(b) AMS notes shall include documentation of:

- i. Wind speed measurements; and
- ii. Prevailing wind direction(s); and
- iii. Wind shut down event(s); and
- iv. Initial air sample locations; and
- v. Air sample relocation notes; and
- vi. Observations of visible emissions and responses; and

- vii. Notes pertaining to sample malfunctions (pump faults, overloading, etc.); and
- viii. Instances of samples being compromised (samples knocked over, sample filters being sprayed with water, samples physically impacted by equipment, etc.); and
- ix. Air sample data (flow rates, time of sampling, volumes, calibration method, etc.).

(c) General documentation shall include:

- i. Disposal records; and
- ii. Analytical reports including chain of custody forms; and
- iii. Evaluations of any samples with a “cannot be read” analysis result and the notifications of these events to the Department; and
- iv. Location of known remaining RACS; and
- v. Creation and removal dates for, and locations of, staged, stockpiled, and/or stored RACS; and
- vi. Stockpile and staging pile inspection logs and documentation of weather events requiring inspection; and
- vii. Logs of all site personnel with access to the RWA; and
- viii. Certification records for all CABIs and AMSs utilized on the project, and
- ix. Records for training conducted in accordance Sections 5.5.3(A) and 5.5.3(B); and
- x. Records demonstrating the QPM(s) meet the training and experience requirements set forth in Section 5.5.3(C); and
- xi. ECP(s) generated during the project.

5.5.8 PACKAGING AND DISPOSITION OF REGULATED ASBESTOS CONTAMINATED SOIL (RACS)

(A) Disposal of RACS

- (1) RACS containing one percent (1%) or greater of friable ACM (as determined in the field by a CABI) by volume per load or container, based on visual estimation through continuous visual inspection or other Department-approved quantifiable means of measurement, shall be packaged in a leak tight container and disposed as friable asbestos waste, in accordance with Section 5.3 of these regulations. Alternatively, a friable ACM determination by a CABI is not required if the disposal load is assumed to be RACS containing 1% or greater of friable ACM and is packaged and disposed of in accordance with Section 5.3 of these regulations. Documentation shall accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.

(2) For RACS containing:

- (a) Less than one percent (1%) of friable ACM (as determined in the field by a CABI) by volume, per load or container, based on visual estimation through continuous visual inspection, or other Department-approved quantifiable means of measurement, shall be packaged in a leak tight container and disposed in a manner similar to non-friable asbestos waste, as described in Section 5.2 of these regulations. Documentation must accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.
- (b) Except as provided by Section 5.5.8(A)(3), only visible non-friable ACM (as determined in the field by a CABI) that has not been rendered friable, or RACS that contains no visible ACM, shall be packaged in a leak tight container and disposed of as non-friable asbestos waste in accordance with Section 5.2 of this Part 5. Documentation shall accompany each load of RACS removed from the site stating that soil originating from this site shall not be used as daily cover or reused offsite.
- (c) A total volume of debris that is less than 1% of the disposal load, based on visual estimation through continuous visual inspection, and the debris is all assumed to be RACS, then a CABI is not required to make a friable ACM determination.

(3) Owners/operators may utilize alternative packaging for RACS, that contains only non-friable ACM and/or asbestos fibers in soil, that ensures that there are no visible emissions during transport to or from the landfill. The alternative packaging must also be acceptable to the disposal facility accepting the waste. A written notice shall be submitted to the Department at least forty-eight (48) hours prior to the alternative packaging being used. If alternative packaging will be used for material that contains any amount of friable asbestos waste, the alternative packaging shall be in accordance with Section 5.3.5 of the Regulation.

(4) A Design and Operations (D&O) plan shall be submitted to, and approved by, the Department for onsite disposal of RACS outside of the AOC, in accordance with the Colorado Solid Wastes Disposal Sites and Facilities Act (C.R.S. 30-20, Part 1) and these regulations. The packaging requirements set forth above in Section 5.5.8(A)(1-2) are not required for onsite disposal, but the requirements of Section 5.5.5(A)(2)(e) are applicable. An environmental covenant, in accordance with 25-15-320, C.R.S., is required for onsite RACS disposal, and a Certificate of Designation shall be required, in accordance with Section 1.6 of these regulations, unless exempt under Section 1.4.

(B) Onsite reuse of RACS:

- (1) A plan for reuse of RACS within the footprint of the AOC shall be submitted to the Department for review and approval prior to implementation and shall comply with Section 5.5.5(A)(2)(e), and the following cover requirements:
 - (a) Cover RACS with geofabric, followed by eighteen (18) inches of fill suitable for unrestricted use, and vegetation; or
 - (b) Cover RACS with geofabric, followed by six (6) inches of fill suitable for unrestricted use, and concrete or asphalt; or
 - (c) Cover RACS with geofabric, followed by fill suitable for unrestricted use to grade or six (6) inches, whichever is greater, for vertical excavation faces or trenches; and
 - (d) The final grades shall promote surface water run-off and minimize erosion, and shall have slopes no less than 5% (20:1) and no greater than 25% (4:1); or
 - (e) Alternate cover designs as approved by the Department; and
 - (f) An environmental covenant, in accordance with 25-15-320, C.R.S., may be required for onsite reuse of RACS.
- (2) A plan for beneficial reuse of RACS outside the footprint of the AOC, in accordance with Section 8.6, shall be submitted to the Department for review and approval prior to its implementation. The plan shall include provisions for covering RACS and shall comply with the management requirements of Section 5.5.5(A)(2)(e). Additionally, the cover requirements outlined in Section 5.5.7(K) shall be adhered to. An environmental covenant, in accordance with 25-15-320 C.R.S. may be required for beneficial reuse of RACS.

(C) Demonstration of Non-RACS

- (1) Soil or other matrix material initially determined to be RACS may be demonstrated not to be RACS based on visual inspection, removal of all ACM, and sampling and analysis of the remaining material showing no detectable asbestos. Sampling and analysis shall be conducted in accordance with Appendix 5A. If there is no detectable asbestos, this material is no longer subject to Section 5.5 and may be appropriate for unrestricted use, onsite or offsite, as long as it does not contain any other regulated material.

5.5.9 FEES

The Department shall collect fees, from the owner, operator, or person conducting the soil disturbing activity, based on total documented costs, in accordance with Section 1.7

APPENDIX 5A

SAMPLE COLLECTION PROTOCOLS AND ANALYTICAL METHODOLOGIES

1.0 Purpose

- (A) The purpose of this appendix is to establish standard sample collection requirements and analytical methods and procedures for use in identifying and quantifying asbestos fibers in air, bulk material, and environmental media such as soil or ash.

2.0 Sample Collection Requirements

- (A) The following sample collection requirements shall be followed when collecting samples for the purpose of determining the applicability of Section 5.5, and when collecting samples necessary to comply with the requirements of Section 5.5. Remediation plans submitted in accordance with Section 5.5.6 shall include a site specific sampling and analysis plan that incorporates the sample collection methodologies and analytical procedures in this Appendix, or proposes alternatives, and include site specific clearance criteria.

2.1 Bulk Samples

- (A) Bulk samples shall be collected, in a manner sufficient to determine whether the material is asbestos-containing material (ACM) or not ACM, from each type of suspect ACM. Bulk samples shall be collected by a State of Colorado certified Asbestos Building Inspector (CABI). In the absence of bulk sample collection, any suspect ACMs must be assumed to be ACMs.
- (B) Bulk samples shall be collected by homogenous type based on color, pattern, texture, thickness, associated materials, or by other identifying characteristics. Additionally, the quantity and location of a suspect material shall be used to determine the number of bulk samples required to characterize the asbestos content of each homogeneous suspect material. For the purpose of determining that a homogeneous suspect material does not contain asbestos, a minimum of three (3) bulk samples shall be collected from the homogeneous material unless there is insufficient material to constitute three (3) samples. If one of the collected samples of a homogeneous bulk material is determined to be ACM, then the homogeneous material shall be considered ACM.

2.2 Soil Samples

- (A) Samples collected to determine asbestos content in soil shall be ten (10) point aliquot composite samples collected from a maximum area of 1,250 square feet (representing 0-6 inches beyond the exposed surface) or a maximum volume of forty (40) cubic yards. Individual aliquots shall be approximately 1/10 of the entire sample volume. At each aliquot location approximately one (1) tablespoon of soil shall be collected. The total volume of the ten (10) aliquots should equal roughly a half cup. The total collected sample volume should be greater than one quarter ($\frac{1}{4}$) cup, but should not exceed one cup. Aliquot locations shall be randomly selected but shall be representative of the entire sample area or volume (to be inclusive of the interior of soil piles in addition to the surface). However, aliquots shall be co-located with any areas where friable ACM was formerly present. All samples collected to determine asbestos content shall be collected by a CABI.
- (B) Sampling for clearance purposes of any exposed horizontal or vertical surface shall have the following additional requirements:
- 1) The aliquots of a clearance sample shall not be collected until after the RACS, and the required amount of associated material, has been removed.
 - 2) A visual inspection shall be performed and passed (i.e., no visible ACM present) by a CABI prior to the collection of soil samples. Visual inspections shall include the following:
 - a) The area to be cleared shall be designated before the visual inspection; and
 - b) Former locations of friable materials shall be designated; and
 - c) The surface being inspected shall be dry enough to allow identification of suspect ACM; and
 - d) The visual inspection shall be conducted in adequate lighting; and
 - e) The area to be cleared shall be free of visual impediments (e.g. snow cover, plastic sheeting, standing water, etc.); and
 - f) At a minimum, the area to be cleared shall be inspected in at least two (2) perpendicular directions; and
 - g) Single or multiple inspectors may be used to perform a visual inspection and clearance. However, a single inspector shall not

visually inspect more than a five (5) foot width with each pass [i.e. for a clearance area that is 25' x 50' a single inspector would be required to make at least five (5) passes in one direction (25' length) and at least ten (10) passes in the other direction (50' length)]; and

- h) Detailed close examination of the area being cleared is required. The inspector(s) should use limited invasive inspection techniques, such as periodically sifting the surface being cleared and closely inspecting the disturbed area.
- 3) If sidewalls with six (6) inches or greater of vertical height are present, independent ten (10) point aliquot composite samples shall be collected from each of the sidewalls and the floor of the excavation.

2.3 Ash Samples

- (A) Ash that contains, or is comingled with, suspect ACM and/or construction and demolition debris shall be considered to be RACS unless the ash is sampled, and analysis demonstrates that the ash is not RACS. Representative samples of each type of ash materials shall be sampled and analyzed in the same manner as soil (including area/volumetric limitations of sampling). Ash samples shall be collected by homogenous strata, location, content of other surrounding material, or other observations indicating heterogeneity of the ash present. All samples collected to determine asbestos content shall be collected by a CABI. In the absence of suspect ACM or construction and demolition debris, and in the absence of documented evidence of non-visible asbestos, ash material may be treated as non-RACS.

2.4 Cross Contamination Prevention

- (A) All sample collection equipment shall be decontaminated in a manner sufficient to prevent cross contamination between individual samples or individual composite samples. Decontamination is not required between the collection of aliquots comprising a single composite sample.

2.5 Air Samples for Standard RACS Management

- (A) Air samples shall be collected by drawing air through 0.8-micron (μm), 25-millimeter (mm), mixed cellulose ester (MCE) filters, using an open-faced cowl extension oriented face down at an angle of 45°. Sample flow rate shall be between 0.5-10 liters per minute depending on the anticipated duration of sampling and the specified detection sensitivity. The air sampling equipment

shall be run until the minimum volume required is collected for each sample. However, if the minimum air volume required by the method, and/or to reach the required analytical sensitivity, being utilized cannot be met, the State of Colorado trained and certified Air Monitoring Specialist (AMS) shall request that the laboratory prepare the sample using an indirect preparation method, for TEM presence/absence analysis. Air samples shall be collected at a height that is representative of the disturbance activity taking place. However, air samples shall be located at a height between three (3) feet above the ground surface but not to exceed twenty (20) feet above the ground surface. Air samples shall be collected by an AMS.

2.6 Air Samples for Risk-Based Air Threshold Monitoring

- (A) Air samples shall be collected by an AMS. Air monitoring shall be conducted during each partial or full day of soil management activities using fixed and mobile monitors as follows:
- 1) A minimum of four (4) samples shall be collected for each regulated work area (RWA).
 - 2) For the purpose of determining the number of samples necessary, each RWA shall be divided into four (4) equal quadrants. A minimum of one (1) sample shall be collected for each quadrant with an adjacent receptor zone.
 - 3) If an RWA is greater than one (1) acre, one (1) additional sample for each quadrant with an adjacent receptor zone shall be collected and analyzed for each additional one quarter ($\frac{1}{4}$) acre in RWA surface area.
 - 4) Samples shall be located along the RWA perimeter, between the RWA and each adjacent receptor zone. Samples shall be placed between the RWA and any fixed adjacent receptor(s). In the absence of fixed adjacent receptors, sample placement shall be at the AMS's discretion.
 - 5) The sample volume shall be the minimum necessary to meet analytical sensitivity.
 - 6) Samples shall be collected by drawing air through 0.8-micron (μm), 0.25-millimeter (mm), mixed cellulose ester (MCE) filters, using an open-faced cowl extension oriented face down at an angle of 45° .

3.0 Analytical Requirements

- (A) The following analytical methods shall be used to evaluate the presence of asbestos and/or to determine asbestos content when analyzing samples for the purpose of determining the applicability of Section 5.5, and when analyzing samples collected in accordance with Section 5.5:

3.1 Bulk Samples

- (A) Samples of suspect ACM shall be analyzed by polarized light microscopy (PLM), according to United States Environmental Protection Agency (USEPA) Method EPA/600/R-93/116 or equivalent method, to determine if any asbestos fibers are present. If the asbestos content of a sample is estimated to be 1% asbestos or less, but greater than 0%, by a method other than point counting (such as visual estimation), the determination shall be repeated using the point counting technique with PLM. Alternatively, the material may be assumed to be ACM. Analysis shall be conducted by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

3.2 Soil Samples and Ash Samples

- (A) Prior to preparation of a soil or ash sample, bulk materials shall be separated from the soil or ash sample for independent analysis. Any bulk materials identified in a soil or ash sample that contain any amount of asbestos shall be reported as independent layers of the whole sample. The samples shall be adequately prepared (crushed and dried) to facilitate stereomicroscopic analysis by the laboratory. The goal of the preparation process should be to produce dried conglomerates of approximately one eighth inch (1/8") to one quarter inch (1/4") size. Rock and/or stone material does not need to be crushed (this process is not intended to be homogenization). Soil and ash samples shall be analyzed by PLM according to USEPA Method EPA/600/R-93/116 to determine if any asbestos fibers are present. Analysis shall be conducted by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. During the stereomicroscopic analysis (10X – 50X) of the soil/ash sample the analyst shall sift through the sample at a rate of approximately one (1) tablespoon per minute. At the end of the stereomicroscopic analysis the sample shall be agitated or shaken as a final check for asbestos prior to the preparation of PLM grab mounts. At no time during the stereomicroscopic analysis shall a sub sample be collected. The entire sample shall be analyzed and the results reported. If no asbestos was identified by PLM after the initial stereomicroscopic examination, then three (3) random grab mount preparations shall be analyzed by PLM to determine if the sample is none detected for asbestos content. If any asbestos is found by the laboratory it shall be reported even in the absence of a second detection (i.e. there does not need to be a second detection to qualify a trace level of asbestos in the sample). Quantification of asbestos content shall be based on the entire sample volume, and be reported as such.

3.3 Air Samples for Standard RACS Management

- (A) Air samples submitted for Phase Contrast Microscopy (PCM) shall be analyzed according to NIOSH Method 7400 by a laboratory showing successful participation in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program or individual(s) certified through the AIHA Asbestos Analysts Registry (AAR) Program.

- (B) Air samples submitted for Transmission Electron Microscopy (TEM), for which quantification of asbestos is desired, shall be prepared and analyzed according to the standard Asbestos Hazard Emergency Response Act (AHERA) method (AHERA; 40 CFR Part 763, Subpart E, Appendix A). All TEM analysis shall be performed by a NVLAP accredited laboratory. If a presence/absence analysis is desired, the analysis shall be performed using the AHERA method modified in the following manner:
 - 1) A minimum of two (2) preparations shall be prepared and utilized for each sample.
 - 2) Analysis shall be conducted on a minimum of four (4) grid openings or until three (3) or more structures are identified, whichever comes first.
 - 3) Any structure (adhering to the AHERA counting rules) identified during analysis shall be reported.
 - a) Identification of less than three (3) structures shall be reported as present.
 - b) Identification of three (3) or greater structures shall be reported as detected.

- (C) Any air sample analysis that results in a “cannot be read (CBR)” determination from the analyst, or a “not analyzed (NA) or rejected” due to loose debris or uneven loading, shall be evaluated by the AMS to determine if a cause of the CBR or NA can be ascertained. If it is determined that the CBR is a result of overloading from airborne emissions, then the AMS shall request that the laboratory prepare the sample, using an indirect preparation method, for TEM presence/absence analysis.

3.4 Risk-Based Air Threshold Samples

(A) Air samples collected for TEM analysis shall be submitted to a NVLAP accredited laboratory. Samples shall be analyzed by TEM according to ISO Method 10312 with the following modifications for PCM equivalent (PCMe) structures:

- 1) An aspect ratio of 3:1 shall be used when counting structures greater than 5 µm in length, rather than the 5:1 ratio specified in the method.
- 2) A width range of 0.25 to 3 µm will be used when counting PCMe structures, rather than the 0.2 to 3 µm specified in the method.
- 3) A minimum of ten grid openings will be counted, rather than the minimum of four (4) grid openings specified in the method.
- 4) Calculations shall be made based on total fibers rather than primary fibers.

(B) The maximum number of grid openings (GOs) to be counted to achieve the specified analytical sensitivity shall be estimated as follows:

$$\text{Number of GOs} = \text{EFA} \div (\text{A}_{\text{GO}} \times \text{V} \times \text{S} \times \text{CF})$$

where:

EFA = effective filter area (385 for a 25-mm filter)

A_{GO} = area of a grid opening (approximately 0.01 mm²; actual value to be provided by the analytical laboratory)

V = volume of air sampled (in liters [L])

S = analytical sensitivity (structures per cubic centimeter [s/cc])

CF = conversion factor (1000 cc/L)

(C) Any air sample analysis that results in a “cannot be read (CBR)” determination from the analyst, or a “not analyzed (NA) or rejected” due to loose debris or uneven loading, shall be prepared by the laboratory, using an indirect preparation method, for TEM presence/absence analysis.

3.5 Data Evaluation for Risk-Based Air Threshold Samples

(A) General requirements:

- 1) Samples collected for comparison to risk-based air thresholds shall be evaluated based on the average (mean) concentration over the exposure duration.

- 2) All valid data shall be used to calculate daily and ten (10) day rolling averages.
- 3) For all projects a minimum of three (3) samples per day must have quantifiable data (not CBR or rejected). If less than three (3) quantifiable analytical results are available then the daily average is invalid.

(B) Project days 1-9:

- 1) The results of the daily samples must be averaged to calculate a daily average for use in comparing to the risk based air threshold for days 1-9 of monitoring.
- 2) A ten (10) day average shall be calculated for days 1-9. The ten (10) day average shall be comprised of at least eight (8) valid daily average results. However, all valid data shall be used to calculate the ten (10) day average.
- 3) If the ten (10) day average exceeds the risk-based air threshold, engineering controls shall be adjusted to reduce the daily average.
- 4) The Department shall be notified within 24 hours if the calculations in paragraphs 1 and 2 above cannot be completed due to invalid data.

(C) Project days 10 and greater:

- 1) Starting on day 10, a ten (10) day rolling average shall be calculated and compared to the risk-based threshold.
- 2) If average concentration trends indicate the risk-based air threshold will be exceeded before project completion, engineering controls shall be adjusted to reduce the daily asbestos emissions.
- 3) If subsequent evaluation of average concentration trends indicates that the risk-based air threshold will still be exceeded before project completion, additional adjustments to engineering controls shall be made.
- 4) If changes in engineering controls are not effective in reducing airborne concentration trends such that the risk-based air thresholds can be met, consultation with the Department is required.
- 5) The Department shall be notified within five (5) working days if the averaged airborne asbestos concentration for the entire project exceeds the risk-based air threshold.

4.0 Documentation

(A) All of the following sampling and analytical documentation shall be maintained during a project and available for Department review upon request. This documentation need not be submitted to CDPHE unless requested or as required in a project specific plan.

1) Documentation of bulk, soil, and ash samples shall include:

- a. A description of the material being sampled including friability.
 - i. For samples collected for characterization purposes also include an estimate of the quantity of visible suspected RACS present.
 - ii. For samples of ash, also include a brief description of the ash layer, and any associated identifiable debris.
- b. Name of person collecting the sample(s).
- c. Date and time of sample collection.
- d. Location of sample collection (a map, drawing, or diagram showing sample locations in relation to the work area and surrounding area).
- e. The boundary/limits that are represented by the collected sample.
- f. Chain of custody documentation.
- g. Laboratory analysis reports.
- h. Log of characterized homogeneous bulk materials including material descriptions, photographic documentation, and asbestos content.

2) Documentation of air samples shall include:

- a. Name of person collecting the sample(s).
- b. Date and time(s) of sample collection.
- c. Locations of air sample collection.
- d. Any relocation of air samples.
- e. A map, drawing, or diagram showing air sample locations (initial and relocations) in relation to the work area and the surrounding area.
- f. Chain of custody documentation.
- g. Laboratory analysis reports.
- h. Explanation of any air sample malfunctions and any voided air samples.
- i. Risk based air threshold concentration calculations.

- j. Air sample data (flow rates, time of sampling, volumes, calibration method, etc.).
- k. Wind speed measurements.
- l. Prevailing wind directions.
- m. Wind shut down events.
- n. Observations of visible emissions and responses.

5.0 Deviations from Sampling and Analysis Procedures

(A) Deviation from this sampling and analysis appendix shall only be allowed upon consultation with, review by, and approval from, the Department.