

NOTE: 10-28-2022 Revision to Proposed Rule - See proposed revisions to paragraphs (F)(1)(c) and (F)(1)(d) of section 9.3.4 on page 7.

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

TENORM Amendments

1) Section 12 of the Table of Contents of the Solid Waste Regulations is being amended by deleting and reserving Section 12 to read as follows:

PART 1 - REGULATIONS PERTAINING TO SOLID WASTE SITES AND FACILITIES

TABLE OF CONTENTS

**PART B
REQUIREMENTS AND INFORMATION CONCERNING
ALL SOLID WASTE DISPOSAL SITES AND FACILITIES
IN THE STATE OF COLORADO**

SECTION 12 ~~RESERVED WATER TREATMENT PLANT SLUDGE~~

~~Applicable to all water treatment plant sludge disposal sites and facilities~~

~~12.1 General provisions~~

~~12.2 Application information alternatives~~

~~12.3 Sludge acceptance criteria~~

2) Section 1.2 is being amended by adding the following definitions:

1.2 DEFINITIONS

“Technologically enhanced naturally occurring radioactive material” (TENORM) means naturally occurring radioactive material whose radionuclide concentrations are increased by or as a result of past or present human practices. “TENORM” does not include:

A. Background radiation or the natural radioactivity of rocks or soils;

B. “Byproduct material” or “source material”, as defined by Colorado statute or rule; or

C. Enriched or depleted uranium as defined by Colorado or federal statute or rule.

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51
52 [“TENORM Radionuclides” means Radium-226, Radium-228, Lead-210, and Polonium-210.](#)

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57
58 **3) Section 2.1.2 is amended by adding paragraph (C)(5) to read as follows:**

59
60
61 **SECTION 2**

62
63 **MINIMUM STANDARDS**

64
65 **2.1 SITE AND FACILITY STANDARDS. All solid waste disposal sites and facilities shall comply**
66 **with the following standards:**

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68
69 **2.1.2**

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72
73 (C) All sites and facilities, requiring a certificate of designation, shall have a waste
74 characterization and disposal plan approved by the Department and in use for such site and
75 facility. The plan shall outline waste screening methodologies, appropriate waste handling
76 procedures, and waste exclusion procedures which shall be implemented at each facility. The
77 plan shall:

78
79 (1) Describe the responsibility of the waste generator in determining if the generator’s waste
80 is a hazardous waste pursuant to the Colorado Hazardous Waste Regulations, 6 CCR 1007-
81 3, Part 261. Such determination may be made by:

82
83 (i) Testing the waste according to the methods set forth in Subpart C of Part 261 or
84 according to an equivalent method approved by the Department under Section 260.21; or

85
86 (ii) Applying knowledge of the hazard characteristic of the waste in light of the materials
87 or the processes used.

88
89 (2) Include the site and facility’s owner or operator’s evaluations, screening methods, and
90 documentation procedures regarding the generator’s waste characterization determination.

91
92 (3) Include an identification of the waste streams requiring specific waste handling and/or
93 disposal methods; and

94
95 (4) Include a contingency plan developed for handling any hazardous waste that is
96 inadvertently discovered.

97
98 [\(5\) Include: i\) provisions for excluding waste that is TENORM above the exempt limits](#)
99 [established in 6 CCR 1007-1, Part 20.4; or ii\) for solid waste disposal sites and facilities that](#)

100 [are registered under 6 CCR 1007-1, Part 20, provisions for ensuring TENORM disposed at](#)
101 [the facility does not exceed the licensing levels in 6 CCR 1007-1, Part 20; and iii\) a](#)
102 [contingency plan for handling of TENORM waste inadvertently accepted that are above the](#)
103 [levels set forth in \(i\) or \(ii\) as appropriate per the levels specified in the facility's approved](#)
104 [plans.](#)

105
106 *****

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108
109 **4) Section 3.3 is amended by adding subsection 3.3.9 (TENORM Requirements for**
110 **Landfills) to read as follows:**

111
112 **PART B**

113
114 **SECTION 3**

115
116 **STANDARDS FOR SOLID WASTE DISPOSAL LANDFILL SITES AND**
117 **FACILITIES**

118
119 **3.3 OPERATING CRITERIA**

120
121 *****

122
123 **3.3.9 TENORM Requirements for Landfills**

124
125 [Prior to disposing of TENORM above the exempt limits in 6 CCR 1007-1, Part 20, landfills shall be](#)
126 [registered and are subject to the following requirements and limitations, unless they are in](#)
127 [compliance with alternative non-exempt TENORM management and disposal requirements approved](#)
128 [by the Department under 6 CCR 1007-1, Part 20.9 and incorporated into the facility EDOP:](#)

129
130 [A. Must comply with 6 CCR 1007-1, Part 20.](#)

131
132 [B. Must have an approved Waste Characterization Plan \(either stand alone or as an appendix to](#)
133 [the facility's Engineering Design and Operation Plan\) that allows acceptance of TENORM waste](#)
134 [at concentrations, excluding natural background, up to 50 pCi/g each in dry weight of Radium-](#)
135 [226, Radium-228, Lead-210 and Polonium-210. The Waste Characterization Plan must have](#)
136 [waste acceptance procedures specific to TENORM wastes.](#)

137
138 [C. Must have an engineered liner or barrier layer with hydraulic conductivity less than or equal to](#)
139 [1x10⁻⁷ cm/sec in accordance with Section 3.2.5 \(C\)\(2\) or \(3\) of this Section, or in accordance](#)
140 [with Section 3.2.5\(C\)\(4\) of this Section subject to site-specific Division approval.](#)

141
142 [D. Must have a leachate collection system that meets the requirements Section 3.2.5\(d\) of this](#)
143 [Section.](#)

144
145 [E. Must have a groundwater monitoring system in compliance with Sections 2.1.15 and 2.2 of](#)
146 [these regulations.](#)

148 F. Must have a minimum of 4 meters of materials not subject to 6 CCR 1007-1, Part 20, in
149 addition to the engineered liner or barrier layer, between the lowest placement of Non-Exempt
150 TENORM and groundwater.

151
152 G. Must place 6 inches of cover materials not subject to 6 CCR 1007-1, Part 20 on all TENORM
153 at the end of each operating day.

154
155 H. Must have a minimum of 3 meters of not subject to 6 CCR 1007-1, Part 20 requirements
156 above the non-exempt TENORM prior to closure of any area. This may include the final cover
157 system.

158
159 I. Must sample and characterize leachate for each TENORM isotope received by the facility.

160
161 1. If concentrations of TENORM isotopes are detected in the leachate in excess of the
162 groundwater standards these isotopes must be included in the groundwater monitoring plan.

163
164 2. Leachate containing concentrations of TENORM isotopes less than 100 pCi/L may be
165 applied to the working face of the landfill.

166
167 3. TENORM registrants per 6 CCR 1007-1, Part 20 shall not perform any other method of
168 recirculation or application of leachate containing concentrations of TENORM isotopes in
169 excess of groundwater standards within the facility without prior written approval from the
170 Department.

171
172 J. Must place any drill cuttings from methane gas collection system installation within the facility
173 on the working face and treated as TENORM waste.

174
175 K. For sites where solidification activities are approved within the Engineering Design and
176 Operations Plan, must place the Non-exempt TENORM materials received by the facility for
177 solidification within the solidification basins and must commence the solidification process within
178 24 hours of receipt.

179
180 L. Following closure of the landfill, must place an environmental covenant or restrictive notice on
181 the facility property in accordance with C.R.S § 25-15-320 and shall include a specific provision
182 which requires that any future buildings, residential or commercial, constructed on the permitted
183 site post closure, require radon resistant construction, post construction assessment and testing,
184 and radon mitigation sufficient to meet any federal, local, or Colorado standards on indoor radon
185 concentrations. Alternatively, the environmental covenant may prohibit construction of any
186 buildings on the site. **Note:** Irrespective of TENORM considerations, solid waste landfills will
187 trigger an institutional control requirement at closure.

188
189
190 **5) Section 8.6 (Beneficial Use) is amended by adding subsection 8.6.7(C) (Land**
191 **application of water treatment residuals) to read as follows:**

192
193 **SECTION 8**
194 **RECYCLING & BENEFICIAL USE**
195

196 *****

197 **8.6 BENEFICIAL USE**

198 *****

199 **8.6.7(C) Land application of water treatment residuals.**

200 Non-Exempt TENORM in the form of water treatment residuals to be used for land application shall
201 be registered and are subject to the requirements and limitations as follows, unless the Department
202 has approved alternative non-exempt TENORM management requirements under 6 CCR 1007-1,
203 Part 20.9:

204 (1). Registrants may possess materials that contain or are contaminated at concentrations,
205 excluding natural background, greater than 5 pCi/g but not in excess of 50 pCi/g each in dry
206 weight of Radium-226, Radium-228, Lead-210, and Polonium-210.

207 (2). Activities shall be in accordance with a Beneficial Use Certification or Beneficial Use
208 Determination issued by the Hazardous Materials and Waste Management Division of the
209 Department.

210 (3). Application to land for beneficial use.

211 (a). Concentrations of radionuclides in water treatment residuals applied to land shall not
212 exceed 25 pCi/g each of Radium-226, Radium-228, Lead-210, and Polonium-210.

213 (b). Water treatment residuals containing Non-Exempt TENORM shall not be applied to an
214 authorized application site for more than 20 years or 20 cropping cycles without written
215 Department approval.

216 (4). Characterization. Characterization of TENORM materials including sampling and analysis
217 shall be performed using appropriate and standard methods such as EPA SW-846 or equivalent
218 alternative methods recognized by the Department.

219 (a). Water treatment residuals shall be characterized for concentrations of TENORM
220 radionuclides prior to application.

221 (b). Characterization shall be done initially on residuals to be applied to land and thereafter at
222 the following frequencies based on dry short tons per year (dst/y) produced:

223 i. Once per year for less than 319 dst/y.

224 ii. Once per quarter for greater than 319 but less than 1,650 dst/y.

225 iii. Once per two months for greater than 1,650 but less than 16,500 dst/y.

226 iv. Once per month for greater than 16,500 dst/y.

227 (c). Records of characterization shall be maintained for inspection by the Department until
228 such time as the application activities cease at the site.

229 (d). Registrants shall provide notice to the Department sixty days prior to ceasing application
230 activities at the site.

231 (5). Records of land application shall be provided to the Department annually. Records shall
232 include:

233 (a). Each application site location; and

234 (b). Number of applications at each site.

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6) Section 9.2.1 is amended by revising the title of the section and adding paragraph (C) to read as follows:

9.2.1 DESIGN, AND CONSTRUCTION AND OPERATIONS

The following design criteria apply to a Type A waste impoundment.

- (A) **Access control:** The owner or operator shall control public access, prevent unauthorized access, provide for site security both during and after business hours, and prevent illegal dumping of wastes. Effective artificial or natural barriers may be used in lieu of fencing.
- (B) **Stormwater control:** Each waste impoundment shall be designed, constructed and maintained to provide: (1) run-on control and diversion structures to prevent flow into the unit from a 25-year, 24-hour storm, and (2) a run-off control system to collect runoff from a 25-year, 24-hour storm and control run-off from a 100-year, 24-hour storm. Precipitation that cannot be diverted from the impoundment, and therefore comes in contact with impounded waste, shall be managed as solid waste. Each impoundment shall be designed, constructed and maintained to prevent damage to the containment structure from erosion.
- (C) **Characterization:** The owner or operator of a solid waste facility managing potential TENORM waste in a Type A waste impoundment shall ensure that such wastes are representatively characterized according to their TENORM characteristics. Any wastes characterized as non-exempt TENORM wastes must be disposed of at a facility approved to accept such wastes.

7) Section 9.2.5 (Closure) is amended by revising the introductory paragraph to read as follows:

9.2.5 CLOSURE: The owner or operator of each Type A waste impoundment shall develop a closure plan and submit it for Department approval. The closure plan must present sufficient detail to support the closure cost estimates required in Sections 4 and 9.2.2 above and to enable the Department to evaluate the adequacy of financial assurance. For some Type A impoundments, the scope of the closure plan will be limited to sludge and impacted soil removal, disposal and verification sampling to ensure residual contamination is below acceptable levels in soil and ground water. Type A waste impoundments in which potential TENORM wastes have been managed must address INDUSTRY-SPECIFIC -TENORM radionuclides in the closure plan. THIS REQUIREMENT MAY BE SATISFIED THROUGH PROCESS KNOWLEDGE AND WASTE CHARACTERIZATION DATA REPRESENTATIVE OF WASTE DISPOSED OVER THE LIFE OF THE IMPOUNDMENT. IF DEPARTMENT DEEMS PROCESS KNOWLEDGE AND WASTE CHARACTERIZATION DATA TO BE INSUFFICIENT, IT MAY REQUIRE ADDITIONAL SAMPLING FOR RELEVANT TENORM RADIONUCLIDES AT CLOSURE.

8) Section 9.3.3 (Facility Operation Requirements) is amended by revising paragraph (F) and adding paragraph (G)(6) to read as follows:

283 **9.3.3 FACILITY OPERATION REQUIREMENTS**

284
285 (F) **Waste Characterization For Impoundments Accepting Only Wastes Generated On-site:**
286 Waste impoundments accepting only wastes generated on-site shall initially profile each waste
287 stream entering the impoundments and then update the profile as necessary to account for significant
288 changes to the waste generation process. For those Type B waste impoundments accepting potential
289 TENORM waste, the waste profile must include characterization for TENORM radionuclides. Existing
290 facilities may use the Demonstration Report to establish the initial waste profile.

291 (G) **Waste Characterization For Impoundments Accepting Wastes From Third Parties:**

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293
294 (6) Type B waste impoundment facilities accepting waste from third parties must also comply with
295 Section 2.1.2 (C)(5) provisions related to TENORM waste.
296

297 *****

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299
300 **9) Section 9.3.4 (Engineering Design and Operations Plan) is amended by revising**
301 **paragraphs (F)(1)(c) and (F)(1)(d) to read as follows:**

302
303 **9.3.4 ENGINEERING DESIGN AND OPERATIONS PLAN**

304
305 *****

306
307 (F) **Closure Plan:** The EDOP shall include a closure plan that describes the steps necessary to
308 close each impoundment at any point during its active life and at the end of the facility's active
309 life. The facility may either: 1) close the waste in place as a solid waste landfill in accordance
310 with these Solid Waste Regulations, or 2) remove all solid waste and residual contamination to
311 meet unrestricted use concentrations. Option 2, also known as "clean closure," eliminates the
312 need for post-closure care. Both Option 1 and Option 2 require the owner or operator of a waste
313 impoundment to develop a closure plan.

314
315 (1) The closure plan shall include the following information consistent with Section 9.3.6:

316 *****

317 (c) Proposed plans and procedures for sampling and testing soil and ground water at the
318 site, to include INDUSTRY-SPECIFIC TENORM radionuclides if the site accepted- TENORM
319 waste or potential TENORM waste during site operations;

320
321 (d) Provisions for sampling and testing of residual materials, such as sludge and soil, and
322 provisions for final disposal, to include INDUSTRY-SPECIFIC TENORM radionuclides if the site
323 accepted TENORM waste or potential TENORM waste during site operations FOR
324 PURPOSES OF SATISFYING THIS PROVISION AND (F)(1)(C), PROCESS KNOWLEDGE AND WASTE
325 CHARACTERIZATION DATA REPRESENTATIVE OF WASTES DISPOSED OVER THE LIFE OF THE
326 IMPOUNDMENT MAY BE USED TO JUSTIFY THAT FURTHER CHARACTERIZATION FOR TENORM
327 RADIONUCLIDES AT CLOSURE IS NOT NECESSARY. IF DEPARTMENT DEEMS PROCESS KNOWLEDGE

328 AND WASTE CHARACTERIZATION DATA TO BE INSUFFICIENT, IT MAY REQUIRE ADDITIONAL SAMPLING
329 FOR RELEVANT TENORM RADIONUCLIDES AT CLOSURE.

330 *****

331
332
333 **10) Section 12 is deleted in its entirety and reserved to read as follows:**

334
335 **SECTION 12**

336
337 **RESERVED WATER TREATMENT PLANT SLUDGE**

338
339 ~~12.1—GENERAL PROVISIONS—The following general provisions apply to all water treatment plant~~
340 ~~sludge disposal facilities except as provided in 12.1.4 for facilities in operation prior to adoption of~~
341 ~~these regulations.~~

342
343 ~~12.1.1 (A) Any person who disposes of water treatment plant sludge, receives water treatment plant~~
344 ~~sludge for disposal or permits water treatment plant sludge to be disposed of on any facility or~~
345 ~~property which he operates or possesses shall do so in compliance with the requirements of Sections~~
346 ~~1 through 3, and 12 of these regulations.~~

347
348 ~~(B) If a conflict exists between the requirements of Sections 1 through 3 and the requirements of this~~
349 ~~Section 12, the requirements of Section 12 shall control.~~

350
351 ~~(C) Notwithstanding the provisions of (A) and (B) Above, a person who disposes of water treatment~~
352 ~~plant sludge, receives water treatment plant sludge for disposal or permits water treatment plant~~
353 ~~sludge to be disposed of on any facility or property which he operates or possesses is not required to~~
354 ~~comply with subsections 1.4.4, 2.1.8, 2.1.9, 2.3, 3.1.1 of these regulations.~~

355
356 ~~12.1.2—Each water treatment plant sludge disposal facility shall comply with Colorado health laws~~
357 ~~and with the standards, rules and regulations of the Department and the water quality control~~
358 ~~commission and with all applicable local zoning laws and ordinances.~~

359
360 ~~12.1.3—These regulations do not apply to water treatment plant sludges which are beneficially used~~
361 ~~under the authority of the Colorado Domestic Sewage Sludge Regulations.~~

362
363 ~~12.1.4 (A) Surface and ground water monitoring may be required by the Department at existing~~
364 ~~facilities where impairment of existing or future use of surface or ground water is determined to be~~
365 ~~probable.~~

366
367 ~~(B) Those facilities in operation prior to adoption of these regulations may be required to come into~~
368 ~~compliance with these regulations upon a determination by the Department after consultation with the~~
369 ~~local governing body having jurisdiction that such facilities are causing impairment of existing or~~
370 ~~future use of surface water or ground water.~~

371
372 **12.2—APPLICATION INFORMATION ALTERNATIVES** ~~For the purposes of this Section 12 only~~
373 ~~as applied to the disposal of water treatment plant sludge, a person who disposes of water treatment~~
374 ~~plant sludge, receives water treatment plant sludge for disposal or permits water treatment plant~~
375 ~~sludge to be disposed of on any facility or property which he operates or possesses shall also comply~~
376 ~~with the following modifications to Sections 2 and 3 of these regulations:~~

378 ~~12.2.1 If the total alpha activity of the sludge exceeds 40 picocuries per gram of dry sludge, the~~
379 ~~sludge generator shall contact the Department's Radiation Control Division for further disposal~~
380 ~~guidance.~~
381
382 ~~12.2.2 A facility that operated as a water treatment sludge landfill shall: provide compacted fill~~
383 ~~material; provide adequate cover with suitable material; provide surface drainage designed to prevent~~
384 ~~ponding of water, wind erosion; prevent water and air pollution; and upon being filled, shall be left in a~~
385 ~~condition of orderliness and aesthetic appearance capable of blending with the surrounding area. In~~
386 ~~the operation of such a site and facility, the sludges shall be distributed in the smallest area~~
387 ~~consistent with handling traffic to be unloaded and shall be placed in the most dense volume~~
388 ~~practicable.~~
389
390 ~~12.2.3 Adequate fencing, natural barriers or other security measures to preclude public entry shall~~
391 ~~extend around the entire perimeter of the facility and shall include a lockable gate or gates.~~
392
393 ~~12.2.4 All ground water monitoring points shall be installed in accordance with applicable rules and~~
394 ~~regulations of the "Water Well and Pump Installation Contractor's Act," Title 37, Article 91, Part 1,~~
395 ~~CRS 1973 as amended. The facility operator shall be responsible for conducting a program of~~
396 ~~ground water sampling to document and monitor the water quality in such wells.~~
397
398 ~~12.2.5 Ground water quality concentrations shall be monitored regularly, as deemed necessary by~~
399 ~~the Department on a site specific basis.~~
400
401 ~~12.2.6 The type and quantity of material to be used as intermediate cover shall be identified in the~~
402 ~~engineering design and operations report of each water treatment plant sludge facility.~~
403
404 ~~12.2.7 The following information shall be provided in the engineering design and operations report of~~
405 ~~each water treatment plant sludge facility: the type and quantity of material that will be required for~~
406 ~~use as a liner, if a liner is required; and the type and quantity of material that will be required for use~~
407 ~~as final cover, including its compaction density, moisture content specifications and the design~~
408 ~~permeability.~~
409
410 ~~12.2.8 Maps and plans, drawn to a convenient common scale, showing the location and depth of cut~~
411 ~~for liners (if required), shall be submitted as part of the engineering design and operations report.~~
412
413 ~~12.2.9 Maps and plans, drawn to a convenient common scale, showing the intermediate and final~~
414 ~~cover, shall be submitted as part of the engineering design and operations report.~~
415
416 ~~12.2.10 Maps and plans, drawn to a convenient common scale, showing the location of all proposed~~
417 ~~monitoring points for surface water and ground water, shall be submitted as part of the engineering~~
418 ~~design and operations report.~~
419
420 ~~12.2.11 Construction details for all proposed monitoring points for surface water stations and ground~~
421 ~~water monitoring wells shall be submitted as part of the engineering design and operations report.~~
422
423 ~~12.2.12 The daily operating hours of the facility, the frequency of operation including the number of~~
424 ~~days per month and the number of months per year, the daily volume in cubic yards to be received on~~
425 ~~operating days, and the expected life of the site shall be included in the engineering design and~~
426 ~~operations report.~~
427 ~~_____~~

428 ~~12.2.13 The engineering design and operations report shall specify the systems of records to be~~
429 ~~maintained documenting incoming waste volumes, water quality monitoring results, as built~~
430 ~~construction details and variations from approved operating procedures.~~

431
432 ~~12.2.14 The amounts and sources of water to be used on site for the control of nuisance conditions,~~
433 ~~construction purposes, and personnel use shall be identified in the engineering design and operations~~
434 ~~report.~~

435
436 ~~12.2.15 Provisions for the monitoring of ground water and surface water after closure shall be~~
437 ~~identified in the engineering design and operations report.~~

438
439 ~~**12.3 — SLUDGE ACCEPTANCE CRITERIA** In addition to compliance with Sections 1 through 3 of~~
440 ~~these regulations, a person who disposes of water treatment plant sludge, receives water treatment~~
441 ~~plant sludge for disposal or permits water treatment plant sludge to be disposed of on any facility or~~
442 ~~property which he operates or possesses shall also comply with the following:~~

443
444 ~~12.3.1 Facilities shall not accept water treatment plant sludges containing any free liquids. U.S.~~
445 ~~Environmental Protection Agency laboratory method 9095, the "Paint Filter Liquids Test", shall be~~
446 ~~used to determine compliance with the requirements of this subsection.~~

447
448 ~~12.3.2 Facilities shall not accept water treatment sludges having a pH less than 6.0 standard units.~~

449
450 ~~12.3.3 No water treatment plant sludge disposal facility shall accept waste of any other kind without~~
451 ~~approval from the County Board of Commissioners or City governing body and the Department.~~

452
453
454 **11) Section 14 is amended by adding subsection 14.4.9 (TENORM Requirements**
455 **for Compost Facilities) to read as follows:**

456
457
458 **SECTION 14**

459
460 **COMPOSTING**

461
462 *****

463 **14.4 – CLASS III COMPOSTING FACILITIES**

464
465 *****

466
467 **14.4.9 TENORM Requirements for Compost Facilities**

468
469 Facilities shall comply with Section 2.1.2(C)(5) of these regulations. Facilities that compost Non-Exempt
470 TENORM shall be registered and are subject to the following requirements and limitations, unless they
471 are in compliance with alternative non-exempt TENORM management and disposal requirements
472 approved by the Department under 6 CCR 1007-1, Part 20.9 and incorporated into the site EDOP:

473
474 A. TENORM registrants per 6 CCR 1007-1, Part 20 may accept and/or process feedstock materials
475 that contain or are contaminated at concentrations, excluding natural background, greater than 5
476 pCi/g but not in excess of 50 pCi/g each in dry weight of Radium-226, Radium-228, Lead-210, and
477 Polonium-210.

479 B. Commercial composting facility activities shall be in accordance with 6 CCR 1007-2 Part 1 Section
480 14.

481
482 1. Prior to accepting any non-exempt TENORM feedstock materials for composting, registrants
483 shall obtain Department approval of a new or revised Engineering Design and Operations Plan
484 that addresses TENORM constituents in:

- 485
486 a. the description of feedstocks;
487 b. the waste characterization plan;
488 c. the evaluation of potential impacts to existing surface water and groundwater quality;
489 d. the groundwater monitoring plan; and
490 e. the compost sampling and testing description.

491
492 C. Sale or Distribution.

493
494 1. Finished compost shall be characterized for concentrations of TENORM radionuclides prior to
495 sale or distribution.

496
497 2. Characterization, including sampling and analysis, shall be performed using appropriate and
498 standard methods such as EPA SW-846 or equivalent alternative methods recognized by the
499 Department.

500
501 3. Characterization shall be done initially on finished compost and thereafter at the following
502 frequencies based on dry short tons per year (dst/y) produced:

- 503
504 a. Once per year for less than 319 dst/y.
505 b. Once per quarter for greater than 319 but less than 1,650 dst/y.
506 c. Once per two months for greater than 1,650 but less than 16,500 dst/y.
507 d. Once per month for greater than 16,500 dst/y.
508 e. If feedstocks change, the initial characterization shall be repeated.

509
510 4. Registrants must ensure that concentrations of TENORM radionuclides in finished compost to
511 be sold or distributed for off-site use shall not exceed 5 pCi/g for any TENORM constituent
512 (Radium-226, Radium-228, Lead-210, and Polonium-210).

513
514 5. Records of characterization data demonstrating compliance with the 5 pCi/g standard shall be
515 maintained for inspection by the Department for no less than 5 years after the materials have
516 been distributed.

517
518 6. Compost that meets the 5 pCi/g standard is acceptable for unrestricted use, provided that other
519 finished compost criteria specified in Section 14.6 are met.

520
521 D. Finished Compost containing Non-Exempt TENORM.

522
523 Finished compost that exceeds the 5 pCi/g standard of 14.4.9.C.4. is considered to contain non-
524 exempt TENORM. Finished Compost containing Non-Exempt TENORM shall be:

- 525
526 1. Transferred only to a recipient registered with the Department in accordance with 6 CCR 1007-
527 1, Part 20 for use or disposal;
528
529 2. Reintroduced into the compost process; or
530

531 3. Transferred to an individual authorized to receive such material under terms of a specific
532 radioactive materials license or equivalent licensing document, issued by the Department, NRC
533 or any Agreement State, or to any person otherwise authorized to receive such material by the
534 Federal Government or any agency thereof, the Department, or an Agreement State.

535
536 **E. Final closure.**

537 The compost facility shall not be closed and released for unrestricted use until:

538
539
540 1. All registered TENORM materials must be disposed or transferred in accordance with paragraph D
541 of this section 14.4.9; and

542
543 2. The owner or operator shall conduct radiological characterization of the facility to ensure that:

544
545 a. Any radionuclide concentration in soil, adjacent to or within the facility boundary, does not
546 exceed the limitation specified in Table 20-1 of 6 CCR 1007-1, Part 20. If any exceedance is
547 found, the facility shall be remediated until the limits in Table 20-1 are met.

548
549 b. Radionuclide concentrations in groundwater do not exceed 5 pCi/L for Radium-226 plus
550 Radium-228 and 5 pCi/L for Lead-210 plus Polonium-210; or the statewide standards for
551 radioactive materials established by the Water Quality Control Commission in accordance with
552 the Water Quality Control Act, whichever is more restrictive. If any exceedance is found, the
553 facility shall conduct groundwater remediation until the above limits are met.

554
555
556 **12) Section 17 is amended by adding subparagraph (C)(6) to section 17.3.3 to**
557 **read as follows:**

558
559
560 **SECTION 17**

561 **COMMERICAL EXPLORATION & PRODUCTION WASTE IMPOUNDMENTS**

562
563
564
565 **17.3 DESIGN, CONSTRUCTION AND OPERATION REQUIREMENTS**

566
567
568 **17.3.3 Operating Requirements**

569
570 **17.3.3(C) Waste Characterization:**

571
572 17.3.3(C)(1) The owner or operator of commercial EP waste disposal facilities shall develop and
573 implement waste analysis procedures to ensure that only EP waste is disposed of at the facility.
574 The disposal of waste streams different from those originally approved shall constitute a
575 significant change in operation and require an approval by the Department and the local
576 governing authority prior to acceptance at the facility. An amendment to the facility's certificate of
577 designation may be required.

578
579 17.3.3(C)(2) The owner or operator of each commercial EP waste impoundment facility shall
580 initially profile and then conduct annual testing on each waste stream entering the facility,
581 including, at a minimum, waste from each well and/or each tank battery and each drilling location,

582 to demonstrate conformance with the original analyses. Each facility must also ensure that EP
583 waste generators using the facility notify the facility when there has been a change in their
584 processes or waste composition.
585

586 17.3.3(C)(3) The owner or operator of each EP waste disposal facility shall analyze at least one
587 sample of the contents of each impoundment annually for the suite of analytes included in
588 Appendix II of the Solid Waste Regulations. Such analysis shall be performed using appropriate
589 methods as specified in the site-wide monitoring plan to provide an accurate representation of
590 constituents and concentration levels found in the waste. If the impounded wastes are subject to
591 stratification, a separate sample shall be taken from each representative level, including settled
592 sludge and oil or other surface accumulation.
593

594 17.3.3(C)(4) Annual testing of unannounced grab samples shall be taken from random vehicles
595 entering the facility and analyses conducted for the original or approved amended list of
596 parameters. If any waste is found to differ from the original analysis, the Department and local
597 governing body having jurisdiction shall be notified in writing within seven (7) calendar days, and
598 a request to modify the design and operation plan submitted to the Department and local
599 governing authority for review and approval prior to continuing acceptance the identified waste
600 stream.
601

602 17.3.3(C)(5) EP waste disposal facilities shall not receive hazardous waste and will conduct
603 waste profiling in accordance with Section 2 and their approved waste characterization plan (as
604 amended to conform to this Section 17).
605

606 [17.3.3\(C\)\(6\) EP waste disposal facilities must also comply with Section 2.1.2 \(C\)\(5\) provisions](#)
607 [related to TENORM waste.](#)
608

609 *****
610

611
612 **13) Section 17 is amended by adding subsection 17.5.8 (Closure Provisions**
613 **Related to TENORM) to read as follows:**
614

615
616 **SECTION 17**
617

618 **COMMERICAL EXPLORATION & PRODUCTION WASTE IMPOUNDMENTS**
619

620
621 **17.5 CLOSURE**
622

623 *****
624

625 [17.5.8 Closure Provisions Related to TENORM](#)
626

627 [The facility closure plan shall include a detailed site investigation and remediation if necessary, for](#)
628 [TENORM radionuclides. The closure plan shall be submitted to the Department for review and approval](#)
629 [at least sixty \(60\) days prior to closure. The closure plan shall address, but not be limited to:](#)
630

631 [A. Sampling and analysis to determine the extent of contamination in or compliance with](#)
632 [standards for soil, surface water, and groundwater;](#)

- 633
634 B. Activities required to decommission and remove all equipment contaminated with TENORM
635 materials subject to Part 20 (may be inapplicable to disposal facilities, for registrants only);
636 and
637
638 C. Disposal of residual TENORM subject to Part 20.
639
640 Owners and operators of facilities where non-exempt TENORM was accepted during the life of the facility
641 or is identified as a result of the closure plan investigation shall be required to amend their closure plan
642 for the following provisions:
643
644 A. Facility access control;
645
646 B. Potential exposures to TENORM during remedial activities including either a radiological
647 dose estimate demonstrating that no individual will exceed an annual dose of 100 millirem (1
648 millisievert) or information on the individuals authorized to perform such operations under
649 terms of a specific radioactive materials license or equivalent licensing document, issued by
650 the Department, NRC or any Agreement State;
651
652 C. Schedule for remedial and closure activities to be conducted and completed;
653
654 D. Post-closure monitoring for TENORM radionuclides if determined necessary by the
655 Department; and
656
657 E. Following closure of the waste management units covered at the facility, an environmental
658 covenant or restrictive notice must be placed on the facility property and shall include a
659 specific provision which requires that any future buildings, residential or commercial,
660 constructed on the permitted site post closure, require radon resistant construction, post
661 construction assessment and testing, and radon mitigation sufficient to meet any federal,
662 local, or Colorado standards on indoor radon concentrations. Alternatively, the environmental
663 covenant may prohibit construction of any buildings on the site. This paragraph does not
664 apply in cases where no environmental covenant would be required under 25-15-320(1),
665 C.R.S. **Note:** Closure of solid waste in place, irrespective of TENORM considerations, would
666 trigger the institutional control requirement.

44 Regulation, the pertinent requirements from Part 20 are proposed for direct adoption
45 in the Solid Waste Regulations. Section 12 on the management and disposal of
46 drinking water treatment residuals is proposed for deletion because its provisions for
47 TENORM characterization have now been superseded by the Part 20 TENORM
48 Regulation, and because its provisions for landfilling of sludge have been
49 superseded by Section 3 of the Solid Waste Regulations. Only one site permitted
50 under Section 12 is still operating and it will not be required to be re-permitted under
51 Section 3. Finally, for the subset of Section 9 waste impoundments that manage
52 potential TENORM waste, those facilities would need to modify their closure plans to
53 account for TENORM constituents.

54
55 Exempt and non-exempt TENORM are terms used but not explicitly defined in these
56 proposed, revised regulations. The term “exempt TENORM” as used in this revision
57 refers to TENORM materials that qualify for exemption under Section 20.4 of the
58 Part 20 TENORM Regulation. “Non-exempt TENORM” refers to TENORM materials
59 that do not qualify for exemption under Section 20.4.

60
61 “Industry-specific TENORM radionuclides” refers to the industry-specific
62 radionuclides that may be used for characterizing potential TENORM generated by
63 each industry or operation. This list may be found in Table A.1.1 (Industry-specific
64 Radionuclides for TENORM Characterization) of the GUIDANCE FOR
65 IMPLEMENTATION OF THE FINAL RULE “REGISTRATION AND LICENSING OF
66 TECHNOLOGICALLY ENHANCED NATURALLY OCCURRING RADIOACTIVE
67 MATERIAL (TENORM)” 6 CCR 1007-1 PART 20, Addendum A: TENORM
68 Characterization.

69 70 Description of Local Government Involvement in the Stakeholder Process

71
72 Executive Order D 2011-005 (EO-5), “Establishing a Policy to Enhance the
73 Relationship between State and Local Government” requires state rulemaking
74 agencies to consult with and engage local governments prior to the promulgation of
75 any rules containing mandates. The Department completed an EO-5 Internal
76 Communication Form – Conception Phase that was transmitted to local governments.
77 These regulations would impact any county or municipality that operates a commercial
78 landfill. Additionally, local governments that operate commercial compost facilities or
79 section 9 impoundments would be affected to the extent that these waste
80 management units manage potential TENORM. The Department maintains contact
81 lists for solid waste facility owners and operators, and these were used to invite
82 entities who operate these types of facilities (including local governments) to
83 stakeholder meetings held for these different sectors.

84 85 **Issues Encountered During Stakeholder Process:**

86
87 The National Waste and Recycling Association (NWRA) was the sole commenter
88 during both written comment periods of the proposed rulemaking stakeholder process.
89 The first set of comments resulted in changes to the proposal. The second set of
90 comments showed that the NWRA’s issues were mostly resolved, with two exceptions
91 being as follows.
92

93 First, NWRA recommended, for simplicity's sake that the Part 20 TENORM Regulation
94 requirements be referenced, not repeated, in the Solid Waste Regulations. The
95 Division considered this option but decided against it, reasoning that it is arguably
96 more user-friendly to have the pertinent requirements repeated in the Solid Waste
97 Regulations, rather than forcing solid waste sites to read two different sets of rules
98 simultaneously to obtain the full scope of requirements. Additionally, including the
99 TENORM provisions in the Solid Waste Regulations is necessary for the Solid Waste
100 and Materials Management Program (Program), as the primary regulator of solid waste
101 facilities and the entity that approves the Engineering Design and Operations Plans
102 that will incorporate requirements related to TENORM, to have the ability to enforce
103 these requirements.

104
105 Second, the NWRA highlighted what they perceive as a disconnect with groundwater
106 monitoring and remediation requirements in the Part 20 Regulation itself. Since this
107 rulemaking is solely for the purpose of consistency with the existing Part 20 Regulation,
108 making changes to the underlying Part 20 Regulation is outside the scope of this
109 rulemaking.

110

111 **Regulatory Alternatives**

112

113 No other regulatory alternatives were evaluated.

114

115 **Cost/Benefit Analysis**

116

117 A cost / benefit analysis will be performed if requested by the Colorado Department of
118 Regulatory Agencies.