

1 **CHAPTER 24**

2
3 **Class VI Injection Wells and Facilities**
4 **Underground Injection Control Program**
5

6 **Section 1. Authority.**
7

8 These regulations are promulgated pursuant to Wyoming Statutes (W.S.) §§ 35-11-101 through
9 2005, specifically § 313.
10

11 **Section 2. Definitions.**
12

13 The following definitions supplement the definitions contained in Section § 35-11-103 of the
14 Wyoming Environmental Quality Act.
15

16 (a) “Abandoned well” means a well whose use has been permanently discontinued or
17 that is in a state of disrepair such that it cannot be used for its intended purpose or for
18 observation purposes. Temporary or intermittent cessation of injection operations is not
19 abandonment.
20

21 (b) "Aquifer" means a zone, stratum, or group of strata that can store and transmit
22 water in sufficient quantities for a specific use.
23

24 (c) “Area of review” means the subsurface three-dimensional extent of the carbon
25 dioxide plume, associated pressure front, and displaced fluids, as well as the overlying
26 formations, and surface area above that delineated region.
27

28 (d) "Background" means the constituents or parameters and the concentrations or
29 measurements that describe water quality and water quality variability prior to the underground
30 injection.
31

32 (e) “Bore/casing annulus” means the space between the wellbore and the well casing.
33

34 (f) “Carbon dioxide plume” means the underground extent, in three dimensions, of
35 an injected carbon dioxide stream.
36

37 (g) “Carbon dioxide stream” means carbon dioxide, plus associated substances
38 derived from the source materials and any processing, and any substances added to the stream to
39 enable or improve the injection process. Within this Chapter, the term “carbon dioxide stream”
40 does not include any carbon dioxide stream that meets the definition of a hazardous waste under
41 40 C.F.R. § 261.3.
42

43 (h) “Casing” means a pipe or tubing of appropriate material, of varying diameter and
44 weight, lowered into a borehole during or after drilling to support the sides of the hole to prevent
45 the walls from caving, to prevent loss of drilling mud into porous ground, or to prevent water,
46 gas, or other fluid from entering or leaving the hole.

47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92

(i) “Casing/tubing annulus” means the space between the well casing and the tubing.

(j) “Cementing” means sealing the annular space around the outside of a casing string using a specially formulated mixture to hold the casing in place and prevent any movement of fluid in this annular space. Cementing also includes operations to seal the well at the time of abandonment.

(k) “Class I well” means a well used to inject hazardous or non-hazardous industrial, commercial, or municipal waste beneath the lowermost formation containing, within one-quarter (1/4) mile of the well bore, an underground source of drinking water.

(l) “Class II well” means any well used to dispose of water or fluids directly associated with the production of oil or gas, any well used to inject fluids or gas for enhanced oil recovery, or any well used for the storage of liquid hydrocarbons.

(m) “Class V facility” means any property that contains an injection well, drywell, or subsurface fluid distribution system that is not defined as a Class I, II, III, IV, or VI well in these Regulations. A Class V facility includes all systems of collection, treatment, and control that are associated with the underground injection.

(n) “Class VI well” means a well that is used for injecting a carbon dioxide stream for geologic sequestration that:

(i) Is not experimental in nature and injects a carbon dioxide stream for geologic sequestration, beneath the lowermost formation containing an underground source of drinking water;

(ii) Has been granted a waiver of the injection depth requirements pursuant to requirements of Section 15 of this Chapter; or

(iii) Has received an expansion to the areal extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to Section 16 of this Chapter.

(o) “Confining zone” means a geological formation, group of formations, or part of a formation stratigraphically overlying the injection zone(s) that act(s) as a barrier to fluid movement. For Class VI wells operating under an injection depth waiver, confining zone means a geologic formation, group of formations, or part of a formation stratigraphically overlying and underlying the injection zone(s) that acts as a barrier to fluid movement.

(p) “Contaminant” means any pollution; wastes; or physical, chemical, biological, or radiological substance or matter in water.

(q) “Corrective action” means the use of Administrator-approved methods to ensure that wells within the area of review do not serve as conduits for the movement of fluids into

93 geologic formations other than those authorized under the permit.

94

95 (r) “Endanger” means to expose to actions or activities that could pollute an
96 underground source of drinking water.

97

98 (s) “Exempted aquifer” means an aquifer or a portion thereof that meets the criteria
99 in the definition of underground source of drinking water but that has been exempted according
100 to the procedures in Section 16 of this Chapter.

101

102 (t) “Fact sheet” means a document briefly setting forth the principal facts and the
103 significant factual, legal, methodological, and policy questions considered in preparing the draft
104 permit.

105

106 (u) “Geologic sequestration project” means an injection well or wells used to emplace
107 a carbon dioxide stream into an injection zone for geologic sequestration. It includes the
108 subsurface three-dimensional extent of the carbon dioxide plume, associated pressure front, and
109 displaced fluid, as well as the surface area above that delineated region.

110

111 (v) “Groundwater” means subsurface water that fills available openings in rock or
112 soil materials such that they may be considered water saturated under hydrostatic pressure.

113

114 (w) “Groundwaters of the State” are all bodies of underground water that are wholly
115 or partially within the boundaries of the State.

116

117 (x) “Hazardous waste” means a hazardous waste as defined in 40 C.F.R. § 261.3.

118

119 (y) “Indian lands” and “Indian country” means:

120

121 (i) All land within the limits of any Indian reservation under the jurisdiction
122 of the United States Government, notwithstanding the issuance of any patent, and, including
123 rights-of-way running through the reservation;

124

125 (ii) All dependent Indian communities within the borders of the United States
126 whether within the original or subsequently acquired territory thereof, and whether within or
127 without the limits of a state; and

128

129 (iii) All Indian allotments, the Indian titles to which have not been
130 extinguished, including rights-of-way running through the same.

131

132 (z) “Injectate” means the material injected through any underground injection
133 facility.

134

135 (aa) “Injection zone” means a geologic formation, group of formations, or part of a
136 formation that is of sufficient areal extent, thickness, porosity, and permeability to receive carbon
137 dioxide through a well or wells associated with a geologic sequestration project.

138

139 (bb) “Log” means a written record progressively describing the strata and geologic and
140 hydrologic character thereof to include electrical, radioactivity, radioactive tracer, temperature,
141 cement bond and similar surveys, a lithologic description of all cores, and test data.

142
143 (cc) “Long string casing” means a casing that is continuous from at least the top of the
144 injection interval to the surface and that is cemented in place.

145
146 (dd) “Packer” means a device lowered into a well to produce a fluid-tight seal.

147
148 (ee) “Plugging” means the act or process of stopping the flow of water, oil, or gas into
149 or out of a formation through a borehole or well penetrating that formation.

150
151 (ff) “Plugging record” means a systematic listing of permanent or temporary
152 abandonment of water, oil, gas, test, exploration, and waste injection wells. A plugging record
153 may contain a well log, description of amounts and types of plugging material used, the method
154 employed for plugging, a description of formations that are sealed, and a graphic log of the well
155 showing formation location, formation thickness, and location of plugging structures.

156
157 (gg) “Plume stabilization” has been achieved when the carbon dioxide stream that has
158 been injected subsurface essentially no longer expands vertically or horizontally and poses no
159 threat to underground sources of drinking water, human health, safety, or the environment, as
160 demonstrated by a minimum of three (3) consecutive years of monitoring data.

161
162 (hh) “Post-injection site care” means the monitoring, measurement, verification, and
163 other actions (including corrective action) needed to ensure that underground sources of drinking
164 water are not endangered following the cessation of injection, and plugging and abandonment of
165 injection wells until plume stabilization has been achieved and certified by the Administrator, as
166 required under Section 24 of this Chapter.

167
168 (ii) “Pressure front” means the zone of elevated pressure that is created by the
169 injection of the carbon dioxide stream into the subsurface. The pressure front of a carbon dioxide
170 plume refers to a zone where there is a pressure differential sufficient to cause movement of
171 injected fluids or formation fluid if a migration pathway or conduit existed.

172
173 (jj) “Radioactive waste” means any waste that contains radioactive material in
174 concentrations that exceed those listed in 10 C.F.R. Part 20, Appendix B, Table II, Column 2.

175
176 (kk) “Receiver” means any zone, interval, formation, or unit in the subsurface into
177 which a carbon dioxide stream is injected.

178
179 (ll) “Responsible corporate officer” means a president, secretary, treasurer, or vice
180 president of the corporation in charge of a principal business function, or any other person who
181 performs similar policy- or decision-making functions for the corporation.

182
183 (i) For a corporation, “responsible corporate officer” means:
184

185 (A) A president, secretary, treasurer, or vice president of the
186 corporation in charge of a principal business function, or any other person who performs similar
187 policy- or decision-making functions for the corporation; or
188

189 (B) The manager of one (1) or more manufacturing, production, or
190 operating facilities employing more than 250 persons or having gross annual sales or
191 expenditures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign
192 documents has been assigned or delegated to the manager in accordance with corporate
193 procedures.
194

195 (ii) For a partnership, “responsible corporate officer” means a general partner.
196

197 (iii) For a sole proprietorship, “responsible corporate officer” means the
198 proprietor.
199

200 (iv) For a municipality, state, federal or other public agency, “responsible
201 corporate officer” means the principal executive officer or ranking elected official. For the
202 purposes of this definition, a principal executive officer of a federal agency includes:
203

204 (A) The chief executive officer of the agency; or
205

206 (B) A senior executive officer having responsibility for the overall
207 operations of a principal geographic unit of the agency, such as a Regional Administrator.
208

209 (v) A corporation, municipality, state, federal or other public agency may
210 authorize an individual or a position that does not meet the requirements of subparagraphs (i),
211 (ii), (iii), or (iv) of this paragraph to act as a “responsible corporate officer.”
212

213 (A) To authorize a responsible corporate officer:
214

215 (I) A person who meets the requirements of subparagraph (i),
216 (ii), (iii), or (iv) of this paragraph shall authorize the responsible corporate officer in writing;
217

218 (II) The authorization shall specify an individual or a position
219 having responsibility for the overall operation of the regulated facility or activity, such as the
220 position of plant manager, operator of a well or a well field, superintendent, or position of
221 equivalent responsibility; and
222

223 (III) The corporation shall submit the written authorization to
224 the Administrator.
225

226 (B) If an authorization under subparagraph (A) of this subparagraph is
227 no longer accurate because a different individual or position has responsibility for the overall
228 operation of the facility, the corporation shall notify the Administrator that the authorization is
229 no longer accurate or shall submit to the Administrator a new authorization satisfying the
230 requirements of subparagraph (A) of this subparagraph prior to or together with any reports,

231 information, or applications to be signed by an authorized representative.
 232

233 (mm) “Secondarily affected aquifer” means an aquifer affected by migration of fluids
 234 from an injection facility that does not directly discharge into the secondarily affected aquifer.
 235

236 (nn) “Site closure” occurs when a geologic sequestration project is released from post-
 237 injection site care responsibilities and the Administrator certifies site closure pursuant to Section
 238 24(b)(iii) of this Chapter.
 239

240 (oo) “Surface casing” means the first string of well casing to be installed in the well.
 241
 242

243 (pp) “Underground injection” means a well injection, a subsurface discharge, a discharge
 244 into a receiver, or the subsurface emplacement of fluids through a well.
 245

246 (qq) “Underground source of drinking water” or “USDW” means an aquifer or
 247 portions thereof that is not an exempted aquifer and:
 248

249 (i) Supplies any public water system; or
 250

251 (ii) Contains a sufficient quantity of groundwater to supply a public water
 252 system, and
 253

254 (A) Currently supplies drinking water for human consumption; or
 255

256 (B) Contains fewer than 10,000 mg/L total dissolved solids.
 257

258 (rr) “Water quality management area” means the area delineated for the protection of
 259 water quality under a Department-approved plan developed under Sections 303, 208, or 201 of
 260 the Clean Water Act, 33 U.S.C. § 1251 *et seq.* as amended.
 261

262 (ss) “Well” means:
 263

264 (i) An opening, excavation, shaft, or hole in the ground allowing or used for
 265 underground injection or monitoring;
 266

267 (ii) An improved sinkhole; or
 268

269 (iii) A subsurface fluid distribution system.
 270

271 (tt) “Well plug” means a watertight and gastight seal installed in a borehole or well to
 272 prevent movement of fluids.
 273

274 (uu) “Well stimulation” means any process used to clean the wellbore, enlarge
 275 channels, or increase pore space in the interval to be injected and includes surging, jetting,
 276 blasting, acidizing, and hydraulic fracturing.

277
 278 (vv) “Workover” means to pull the tubing, packer, or any downhole hardware from the
 279 well and inspect, replace, or refurbish it prior to placing that hardware back in service, or to enter
 280 the hole with any drilling tool.

281
 282 (ww) “Wellhead protection area” means the area delineated for the protection of a
 283 public water supply utilizing a groundwater source under a Department-approved plan developed
 284 pursuant to Section 1428 of the Safe Drinking Water Act, 42 U.S.C. § 300h-7, or Section 1453 of
 285 the Safe Drinking Water Act, 42 U.S.C. § 300j-13.

286
 287 **Section 3. Applicability.**

288
 289 (a) Construction, installation, operation, monitoring, testing, plugging, post-injection
 290 site care, and modification of any Class VI well shall be allowed only in accordance with this
 291 Chapter.

292
 293 (b) This chapter applies to all Class VI wells.

294
 295 (i) This Chapter applies to owners, operators, and permittees of Class VI
 296 wells.

297
 298 (ii) This Chapter applies to any Class I industrial, Class II, or Class V
 299 experimental or demonstration carbon dioxide injection project that is converted to a Class VI
 300 well. A permitted Class I, Class II, or Class V injection well may be converted to a Class VI well
 301 by obtaining a Class VI permit pursuant to this Chapter.

302
 303 (A) To convert a permitted Class I, Class II, or Class V injection well to a
 304 Class VI well, the applicant shall:

305
 306 (I) Apply for a Class VI permit;

307
 308 (II) Demonstrate to the Administrator that the well was engineered and
 309 constructed to meet the requirements of Section 14(a) of this Chapter; and

310
 311 (III) In lieu of meeting the requirements of Section 14(b) and Section
 312 17(a) of this Chapter, demonstrate to the Administrator that the well will ensure protection of
 313 USDWs and will not endanger any USDW.

314
 315 (B) After December 10, 2011, owners or operators of Class I wells previously
 316 permitted for the purpose of geologic sequestration and Class V experimental technology wells
 317 no longer being used for experimental purposes that will continue injection of carbon dioxide for
 318 the purpose of geologic sequestration shall obtain a Class VI permit.

319
 320 (C) If the Administrator determines that a converted Class I, Class II,
 321 or Class V injection well will not endanger any USDWs, the Administrator may exempt the well
 322 from the requirements of Section 14(b)(i)-(vii) and Section 17(a)(i)-(v) of this Chapter.

323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368

(c) The injection of carbon dioxide for purposes of a project for enhanced recovery of oil or other minerals approved by the Wyoming Oil and Gas Conservation Commission is not subject to the provisions of this Chapter unless the operator converts to geologic sequestration upon the cessation of oil and gas recovery operations or as otherwise required by the Commission or Director.

(d) For owners or operators of Class II wells described in W.S. § 35-11-313(c):

(i) The Director’s determination of primary purpose and increased risk to a USDW shall include, at a minimum, an evaluation of the following criteria:

- (A) Increase in reservoir pressure within the injection zone(s).
- (B) Increase in carbon dioxide injection rates.
- (C) Decrease in reservoir production rates.
- (D) Distance between the injection zone(s) and USDWs.
- (E) Suitability of the Class II area of review delineation.
- (F) Quality of abandoned well plugs within the area of review.
- (G) The owner’s and/or operator’s plan for recovery of carbon dioxide at the cessation of injection.
- (H) The source and properties of the injected carbon dioxide.
- (I) Any additional site-specific factors as determined by the

Administrator.

(ii) An owner or operator may apply for a Class VI permit upon recommendation by the Oil and Gas Conservation Commission supervisor, or by the Commission, that regulation of a Class II enhanced recovery operation be transferred to the Department.

(iii) An owner or operator of a Class II enhanced recovery operation shall apply for a Class VI permit within thirty (30) days of receipt of written notice from the Director that a Class VI permit is required.

Section 4. Processing Permits.

(a) The following permit processing procedures are applicable to all Class VI permits:

369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414

(i) The applicant shall submit the permit application to the Division in a format required by the Administrator.

(ii) Within sixty (60) days of submission of an application, the Administrator shall make an initial determination of completeness. An application shall be determined complete when the Administrator receives an application and any supplemental information necessary to determine compliance with this Chapter. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity.

(iii) Re-submittal of information by an applicant for an incomplete application will restart the process described in this Section.

(iv) At the end of any 60-day review period where an application is determined complete, the Administrator shall:

(A) Prepare a draft permit for issuance or denial;

(B) Prepare a fact sheet on the proposed operation;

(C) Provide public notice pursuant to Section 27 of this Chapter; and

(D) Notify in writing, the contacts, for any Tribes provided pursuant to Section 10(b)(xxxiv) of this Chapter.

(b) If the Administrator intends to modify, terminate, revoke, or reissue a permit, the Administrator shall prepare a draft permit incorporating the proposed changes and provide public notice pursuant to Section 27 of this Chapter.

(c) Prior to issuing a permit for a Class VI well, the Administrator shall consider:

(i) The final area of review based on modeling, using data obtained during logging and testing of the well and the formation as required by subparagraphs (b)(xviii), (b)(xix), (b)(xxvii), and (b)(xxviii) of Section 10 of this Chapter;

(ii) Any relevant updates, based on data obtained during logging and testing of the well and the formation as required by subparagraphs (b)(xviii), (b)(xix), (b)(xxvii), and (b)(xxviii) of Section 10 of this Chapter, to the information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, submitted to satisfy the requirements of subparagraph (b)(xi) of Section 10 of this Chapter;

(iii) The results of the formation testing program required by subparagraph (b)(xix) of Section 10 of this Chapter;

(iv) Final injection well construction procedures that meet the requirements of

415 Section 14 of this Chapter;

416

417 (v) Any updates to the proposed area of review and corrective action plan,
418 testing and monitoring plan, injection well-plugging plan, post-injection site care and site closure
419 plan, or the emergency and remedial response plan submitted under Section 10(b) of this chapter
420 that are necessary to address new information collected during logging and testing of the well
421 and the formation as required by Section 10 of this Chapter.

422

423 (d) Permits may be modified, revoked and reissued, or terminated either in response
424 to a petition from any interested person (including the permittee) or upon the Administrator's
425 initiative.

426

427 (i) All petitions to modify, revoke and reissue, or terminate a permit shall be
428 in writing and shall contain facts or reasons supporting the request.

429

430 (ii) If the Administrator decides a petition to modify, revoke and reissue, or
431 terminate a permit is not justified, the Administrator shall send the petitioner a brief written
432 response giving the reason for the decision. A petition for modification, revocation and
433 reissuance, or termination shall be considered denied if the Administrator takes no action within
434 sixty (60) days after receiving the written request.

435

436 (iii) Denials of petitions for modification, revocation and reissuance, or
437 termination are not subject to public notice and comment.

438

439 (e) The Department shall review each permit at least once every five (5) years to
440 determine whether it should be modified, revoked and reissued, or terminated.

441

442 **Section 5. Denying Permits.**

443

444 (a) The Administrator may deny a permit for any of the following reasons:

445

446 (i) The application is incomplete;

447

448 (ii) The project, if constructed or operated, will violate applicable state surface
449 or groundwater standards;

450

451 (iii) The application proposes the construction or operation of a project that
452 does not meet the requirements of this Chapter;

453

454 (iv) The permitted facility would be in conflict with or is in conflict with a
455 State-approved local wellhead protection plan, State-approved local source water protection plan,
456 or State-approved water quality management plan; or

457

458 (v) Other justifiable reasons necessary to carry out the provisions of the
459 Wyoming Environmental Quality Act.

460

Section 6. Modifying Permits.

(a) The Administrator may modify a permit when:

(i) Any material or substantial alterations or additions to the facility occur after permitting that justify the application of different permit conditions;

(ii) Any modification in the operation of the facility is capable of causing or increasing pollution in excess of applicable standards or permit conditions;

(iii) Information warranting modification is discovered after the operation has begun that would have justified the application of different permit conditions at the time of permit issuance;

(iv) Regulations or standards upon which the permit was based changed after the permit was issued;

(v) Cause exists for termination, as described in this Section, but the Department determines that modification is appropriate;

(vi) Modification is necessary to comply with applicable statutes, standards, or regulations;

(vii) The permit is transferred; or

(viii) The Administrator determines that permit changes are necessary based on:

(A) Area of review reevaluations under Section 13(c)(i) of this Chapter;

(B) Amendments to the testing and monitoring plan under Section 20(b)(xi) of this Chapter;

(C) Amendments to the injection well-plugging plan under Section 23(c) of this Chapter;

(D) Amendments to the post-injection site care and site closure plan under Section 24(a)(iv) of this Chapter;

(E) Amendments to the emergency and remedial response plan under Section 25(a) of this Chapter;

(F) A review of monitoring or testing results; or

(G) A determination that the injectate is a hazardous waste as defined in 40 CFR § 261.3.

507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552

(b) The Administrator may make minor modifications to permits with the consent of the permittee. The Administrator shall notify the permittee of minor modifications to its permit, and the modifications shall become final twenty (20) days from the date of receipt of such notice. Minor modifications may only:

(i) Correct typographical errors;

(ii) Require more frequent monitoring or reporting by the permittee;

(iii) Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement;

(iv) Allow for a permit transfer and change in ownership or operational control of a facility where the Administrator determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees has been submitted to the Administrator;

(v) Change quantities or types of fluids injected that are within the capacity of the facility as permitted and, in the judgment of the Administrator, would not interfere with the operation of the facility or its ability to meet conditions described in the permit and would not change its classification;

(vi) Change construction requirements approved by the Administrator pursuant to Section 9(b)(xxix)(A)-(C) of this Chapter, provided that the alteration complies with the requirements of this Chapter;

(vii) Amend a well-plugging plan that has been updated under Section 23 of this Chapter; or

(ix) Amend a Class VI injection well testing and monitoring plan, well-plugging plan, post-injection site care and site closure plan, or emergency and remedial response plan where the modifications merely clarify or correct the plan.

(c) The Administrator may modify a permit to resolve issues that could lead to the revocation or termination of the permit under Section 7(a) of this Chapter.

(d) When the Administrator modifies a permit, only the conditions that are being modified shall be reopened when a new draft permit is prepared. All other aspects of the existing, unmodified permit shall remain in effect for the duration of the modified permit and the modified permit shall expire on the date when the original permit would have expired. Suitability of the facility location shall not be considered unless new information or standards indicate that a threat to human health, safety, or the environment exists that was unknown at the time of permit issuance.

553
554 (e) The Administrator may require the submission of a new application to modify a
555 permit.
556

557 **Section 7. Terminating, Revoking, and Reissuing Permits.**
558

559 (a) The Administrator may terminate a permit or revoke and reissue a permit for any
560 of the following reasons:

561 (i) Noncompliance with terms and conditions of the permit;

562 (ii) Failure in the application or during the issuance process to disclose fully
563 all relevant facts, or misrepresentation of any relevant facts at any time; or

564 (iii) A determination that the activity threatens human health, safety, or the
565 environment and can only be regulated to acceptable levels by a permit modification or
566 termination.
567

568 (b) As part of any notice of intent to terminate a permit, the Administrator shall order
569 the permittee to proceed with reclamation within a reasonable time period.
570

571 (c) A revoked permit may be reissued only if a new application is submitted.
572

573 (d) When a permit is revoked and reissued, the entire permit is reopened as if the
574 permit has expired and is being reissued, except that suitability of the facility location shall not
575 be considered unless new information or standards indicate that a threat to human health, safety,
576 or the environment exists that was unknown at the time of permit issuance. During any
577 revocation and reissuance proceeding, the permittee shall comply with all conditions of the
578 existing permit until a new final permit is issued.
579

580 **Section 8. Transferring Permits.**
581

582 (a) To transfer a permit:

583 (i) The proposed permit transferee shall apply in writing as though that
584 person were the original applicant for the permit; and

585 (ii) The proposed permit transferee shall agree to be bound by all of the terms
586 and conditions of the permit.
587

588 (b) Transfer of a permit is allowed only upon approval by the Administrator.
589

590 (c) When a permit transfer occurs pursuant to this section, the permit rights of the
591 previous permittee automatically terminate.
592

593 (d) Transfer shall not be allowed if the permittee is in noncompliance with any term
594

599 and conditions of the permit unless the transferee agrees to bring the facility back into
600 compliance with the permit.

601
602 (e) A permit may be transferred by modifying the permit or by revoking and
603 reissuing the permit to identify the new permittee and incorporate the requirements of this
604 Chapter and the Wyoming Environmental Quality Act, W.S. § 35-11-101 *et seq.*
605

606 **Section 9. Permit Conditions.**

607
608 (a) Permit conditions shall be incorporated either expressly or by reference. If
609 incorporated by reference, a specific citation to the incorporated conditions shall be given in the
610 permit.

611
612 (b) All permits issued under this Chapter shall contain the following conditions:
613

614 (i) A requirement that the permittee complies with all conditions of the
615 permit, and a statement that any permit noncompliance constitutes a violation of these
616 regulations and is grounds for enforcement action, permit termination, revocation and reissuance,
617 or modification, or for denial of a permit renewal application;
618

619 (ii) A requirement that if the permittee wishes to continue injection activity
620 after the expiration date of the permit, the permittee shall apply to the Administrator for, and
621 obtain, a new permit prior to expiration of the existing permit;
622

623 (iii) A stipulation that it shall not be a defense for a permittee in an
624 enforcement action that it would have been necessary to halt or reduce the permitted activity in
625 order to maintain compliance with the conditions of this permit;
626

627 (iv) A requirement that the permittee shall take all reasonable steps to
628 minimize or correct any adverse impact on the environment resulting from noncompliance with
629 this permit;
630

631 (v) A requirement that the permittee properly operates and maintains all
632 facilities and systems of treatment and control, and related appurtenances, that are installed or
633 used by the permittee to achieve compliance with the conditions of this permit. Proper operation
634 and maintenance includes effective performance, adequate funding and operator staffing and
635 training, and adequate laboratory and process controls including appropriate quality assurance
636 procedures. This provision requires the operation of back-up or auxiliary facilities or similar
637 systems only when necessary to achieve compliance with the conditions of the permit;
638

639 (vi) A stipulation that the filing of a request by the permittee, or at the
640 instigation of the Administrator, for a permit modification, revocation, termination, or
641 notification of planned changes or anticipated non-compliance, shall not stay any permit
642 condition;
643

644 (vii) A stipulation that the permit does not convey any property rights of any

645 sort, or any exclusive privilege;

646

647 (viii) A stipulation that the permittee shall furnish to the Administrator, within a
648 specified time, any information that the Administrator requests to determine whether cause exists
649 for modifying, revoking and reissuing, or terminating the permit, or to determine compliance
650 with the permit. The permittee shall also furnish to the Administrator, upon request, copies of
651 records required to be kept by the permit;

652

653 (ix) A requirement that the permittee shall allow the Administrator, or an
654 authorized representative of the Administrator, upon the presentation of credentials, during
655 normal working hours, to enter the premises where a regulated facility is located, or where
656 records are kept under the conditions of this permit, and:

657

658 (A) Inspect the discharge and related facilities, practices, or operations
659 regulated or required under this permit;

660

661 (B) Review and copy reports and records required by the permit;

662

663 (C) Collect fluid samples for analysis for the purposes of ensuring
664 permit compliance or as otherwise authorized by the Wyoming Environmental Quality Act of
665 any substances or parameters at any location;

666

667 (D) Measure and record water levels;

668

669 (E) Collect resource data as defined by W.S. § 6-3-414; and

670

671 (F) Perform any other function authorized by law or regulation.

672

673 (x) A requirement that:

674

675 (A) If the facility is located on property not owned by the permittee,
676 the permittee shall also secure from the landowner upon whose property the facility is located
677 permission for Department personnel and their invitees to enter the premises where the facility is
678 located, or where records are kept under the conditions of this permit, and collect resource data
679 as defined by W.S. § 6-3-414, inspect and photograph the facility, collect samples for analysis,
680 review records, and perform any other function authorized by law or regulation. The permittee
681 shall secure and maintain such access for the duration of the permit and the post-injection site
682 care and site closure period; and

683

684 (B) If the facility cannot be directly accessed using public roads, the
685 permittee shall also secure permission for Department personnel and their invitees to enter and
686 cross all properties necessary to access the facility. The permittee shall secure and maintain such
687 access for the duration of the permit and the post-injection site care and site closure period;

688

689 (xi) A requirement that the permittee furnishes any information necessary to
690 establish a testing and monitoring pursuant to Section 20 of this Chapter. Conditions shall

691 specify:

692

693 (A) Required monitoring including type, intervals, and frequency
694 sufficient to yield data that are representative of the monitored activity including when
695 appropriate, continuous monitoring;

696

697 (B) Requirements concerning the proper use, maintenance, and
698 installation, of monitoring equipment or methods, including biological monitoring methods; and

699

700 (C) Reporting and notice requirements based upon the impact of the
701 regulated activity and as specified in Section 22 of this Chapter. Reporting shall be no less
702 frequent than specified in Section 22 of this Chapter;

703

704 (xii) A requirement that all samples and measurements taken for the purpose of
705 monitoring shall be representative of the monitored activity and that records of all monitoring
706 information be retained by the permittee;

707

708 (xiii) A requirement that all applications, reports, and other information
709 submitted to the Administrator contain the certifications required in Section 10(d) of this Chapter
710 by a responsible corporate officer;

711

712 (xiv) A requirement that the permittee give advance notice to the Administrator
713 as soon as possible of any planned physical alteration or additions, other than authorized
714 operation and maintenance, to the permitted facility and receive authorization from the
715 Administrator prior to implementing the proposed alteration or addition;

716

717 (xv) A requirement that any modification that may result in a violation of a
718 permit condition shall be reported to the Administrator, and any modification that will result in a
719 violation of a permit condition shall be reported to the Administrator through the submission of a
720 new or amended permit application;

721

722 (xvi) A requirement that any transfer of a permit shall first be approved by the
723 Administrator, and that no transfer will be approved if the facility is not in compliance with the
724 existing permit unless the proposed permittee agrees to bring the facility into compliance;

725

726 (xvii) A requirement that monitoring results shall be reported at the intervals
727 specified in the permit;

728

729 (xviii) A requirement that reports of compliance or non compliance, or any
730 progress reports on interim and final requirements contained in any compliance schedule (if one
731 is required by the Administrator) shall be submitted no later than thirty (30) days following each
732 schedule date;

733

734 (xix) The following reporting and mitigation requirements:

735

736 (A) If any monitoring or other information indicates that any

737 contaminant, the injected carbon dioxide stream, displaced formation fluids, or associated
738 pressure front may endanger a USDW or threaten human health, safety, or the environment, the
739 permittee shall:

- 740
- 741 (I) Immediately cease injection;
 - 742
 - 743 (II) Take all steps reasonably necessary to identify and
744 characterize any release;
 - 745
 - 746 (III) Orally notify the Administrator within twenty-four (24)
747 hours of discovering the condition; and
 - 748
 - 749 (IV) Provide a written report to the Administrator within five (5)
750 days of discovering the condition. The written report shall contain:

- 751
- 752 (1.) A description of the endangerment and its cause;
 - 753
 - 754 (2.) The period of endangerment, including exact dates
755 and times, and, if the endangerment has not been controlled, the anticipated time it is expected to
756 continue; and
 - 757
 - 758 (3.) The steps taken or planned to reduce, eliminate, and
759 prevent reoccurrence of the endangerment;

760

761 (B) If the permittee discovers any noncompliance with a permit
762 condition or a requirement of this Chapter that may cause fluid migration into or between
763 USDWs, any malfunction of the injection system that may cause fluid migration into or between
764 USDWs, or any excursion, the permittee shall:

- 765
- 766 (I) Orally notify the Administrator within twenty-four (24)
767 hours of discovering the condition;
 - 768
 - 769 (II) Provide a written report to the Administrator within five (5)
770 days of discovering the condition, which shall contain:
 - 771
 - 772 (1.) A description of the noncompliance, malfunction, or
773 excursion and its cause;
 - 774
 - 775 (2.) The period of noncompliance, malfunction, or
776 excursion, including exact dates and times, and, if the noncompliance, malfunction, or excursion
777 has not been controlled, the anticipated time it is expected to continue; and
 - 778
 - 779 (3.) The steps taken or planned to reduce, eliminate, and
780 prevent reoccurrence of the noncompliance, malfunction, or excursion.

781 .

- 782 (III) If an excursion is discovered, provide written notice to all

783 surface owners, mineral claimants, mineral owners, lessees, and other owners of record of
784 subsurface interests within thirty (30) days of discovering the excursion; and

785
786 (IV) Implement the emergency and remedial response plan approved by
787 the Administrator;

788
789 (xx) A requirement that the permittee report all instances of noncompliance not
790 already required to be reported under subparagraph (b)(xix)(B) of this Section, at the time
791 monitoring reports are submitted. The reports shall contain the information listed in
792 subparagraph (b)(xix)(B)(II) of this Section;

793
794 (xxi) A requirement that if the permittee becomes aware that it failed to submit
795 any relevant facts in a permit application, or submitted incorrect information in a permit
796 application or in any report to the Administrator, the permittee shall promptly submit such facts
797 or information;

798
799 (xxii) A requirement that the injection facility meet construction requirements
800 outlined in Section 14 of this Chapter, that the permittee submit a notice of completion of
801 construction to the Administrator, and that the permittee allows the Administrator to inspect the
802 facility upon completion of construction and prior to commencing any underground injection
803 activity;

804
805 (xxiii) A requirement that the permittee notifies the Administrator before
806 conversion or abandonment of the facility;

807
808 (xxiv) A requirement that injection shall not commence until construction is
809 complete, and that construction is complete when:

810
811 (A) The permittee has submitted a notice of completion of construction
812 to the Administrator; and

813
814 (B) The Administrator has inspected or reviewed the injection well and
815 found it is in compliance with the conditions of the permit;

816
817 (I) Within thirteen (13) days of the date of the notice in
818 subparagraph (xxii) of this paragraph, the Administrator shall provide notice to the permittee of
819 the intent to inspect or review the injection well. The notice shall include a reasonable time
820 period in which the Administrator shall inspect or review the well; but

821
822 (II) If the Administrator does not provide the notice required by
823 subparagraph (I) of this subparagraph, the requirement for prior inspection or review is waived,
824 and the permittee may commence injection;

825
826 (xxv) A requirement that the permittee shall establish mechanical
827 integrity prior to commencing injection or on a schedule determined by the Administrator and
828 that thereafter, the permittee shall maintain mechanical integrity as defined in Section 19 of this

829 Chapter;

830

831 (xxvi) A requirement that if the Administrator determines that a Class VI
832 well lacks mechanical integrity and gives written notice of the determination to the permittee, the
833 permittee shall:

834

835 (A) Cease injection into the well within forty-eight (48) hours
836 of receipt of the Administrator's determination unless the Administrator requires immediate
837 cessation;

838

839 (B) Perform any construction, operation, monitoring, reporting,
840 and corrective action that the Administrator requires to prevent the movement of fluid into or
841 between USDWs caused by the lack of mechanical integrity, or plug the well pursuant to the
842 requirements of Section 23 of this Chapter if allowed by the Administrator; and

843

844 (C) Not resume injection into the well until the Administrator
845 provides written notice that the permittee has demonstrated mechanical integrity pursuant to
846 Section 19 of this Chapter.

847

848 (xxvii) A requirement that, for any Class VI well that lacks mechanical
849 integrity, injection operations are prohibited until the permittee shows to the satisfaction of the
850 Administrator under Section 19 of this Chapter that the well has mechanical integrity;

851

852 (xxviii) A requirement that the permittee comply with a well-
853 plugging plan that meets the requirements of Section 23 of this Chapter, which shall be
854 incorporated into the permit; and

855

856 (xxix) Conditions that implement the requirements of Section 14 of this
857 Chapter. The conditions shall:

858

859 (A) Require all wells to achieve compliance with the
860 requirements of Section 14 of this Chapter according to a compliance schedule established as a
861 permit condition;

862

863 (B) Prohibit construction from commencing until a permit has
864 been issued containing construction requirements;

865

866 (C) Require that all wells comply with the construction
867 requirements of Section 14 of this Chapter prior to commencing injection operations;

868

869 (D) Include a corrective action plan as set forth in Section 13 of
870 this Chapter;

871

872 (E) Require that all wells comply with the operational
873 requirements of Section 14 of this Chapter;

874

875 (F) Establish any maximum injection volumes and pressures
 876 necessary to ensure that fractures are not initiated in the confining zone, to ensure that injected
 877 fluids do not migrate into any underground source of drinking water, to ensure that formation
 878 fluids are not displaced into any underground source of drinking water, and to ensure compliance
 879 with the operating requirements;

880
 881 (G) Establish monitoring and reporting requirements set forth
 882 in Sections 20 and 22 of this Chapter. The permittee shall be required to identify types of tests
 883 and methods used to generate the monitoring data; and
 884

885 (H) Require the permittee to comply with the financial
 886 responsibility requirements set forth in Section 26 of this Chapter.
 887

888 (c) Permits for Class VI wells shall be issued for the operating life of the facility and
 889 extend through the post-injection site care period until the Administrator certifies site closure
 890 pursuant to Section 24(b)(iii) of this Chapter.
 891

892 (d) Permits may be issued for individual Class VI wells and shall not be issued on an
 893 area basis for multiple points of discharge operated by the same person.
 894

895 (e) Permits may specify a schedule of compliance leading to compliance with permit
 896 conditions, this Chapter, and the Wyoming Environmental Quality Act, W.S. § 35-11-101 *et seq.*
 897

898 (i) Schedules of compliance shall require compliance as soon as possible, and
 899 in no case later than three (3) years after the effective date of the permit.
 900

901 (ii) If a permit establishes a schedule of compliance that exceeds one (1) year
 902 from the date of permit issuance, the schedule shall set forth interim requirements and the dates
 903 for their achievement. The time between interim dates shall not exceed one (1) year unless, the
 904 time necessary for completion of any interim requirement is more than one (1) year and is not
 905 readily divisible into stages for completion, and in that case, the permit shall specify interim
 906 dates for the submission of reports of progress toward completion of the interim requirements
 907 and indicate a projected completion date.
 908

909 (iii) The compliance schedule shall require the permittee to submit progress
 910 reports no later than thirty (30) days following each interim date and the final date of
 911 compliance.
 912

913 (f) The Administrator shall include in permits, on a case-by-case basis:
 914

915 (i) Conditions for monitoring, schedules of compliance, and any additional
 916 conditions necessary to prevent the migration of fluids into underground sources of drinking
 917 water. The Administrator shall evaluate what conditions are necessary and shall establish these
 918 conditions when issuing, modifying, or revoking and reissuing permits; and
 919

920 (ii) Conditions to ensure compliance with all applicable requirements of this

921 Chapter and the Wyoming Environmental Quality Act, W.S. § 35-11-101 *et seq.*

922

923 (g) To the extent possible under Section 9 of this Chapter, modified or revoked and
924 reissued permits, shall incorporate all of the permit conditions required by this Section.

925

926 (h) When they meet the requirements of this Chapter and are approved by the
927 Administrator, the following plans shall be incorporated into the permit:

928

929 (i) Stimulation programs required by Section 10(b)(xx) of this Chapter; and

930

931 (ii) Injection and monitoring well plugging plans required by Sections
932 10(b)(xxx) and 23(b) of this Chapter.

933

934 **Section 10. Permit Application.**

935

936 (a) It is the operator's responsibility to apply for and obtain a permit in accordance
937 with these regulations. Each application shall be submitted with all supporting data.

938

939 (b) In addition to the requirements of W.S. § 35-11-313(f)(ii), a complete application
940 for a Class VI well shall include:

941

942 (i) A brief description of the nature of the business and the activities to be
943 conducted that require the applicant to obtain a permit under this Chapter;

944

945 (ii) The name, address, and telephone number of the operator, and the
946 operator's ownership status and status as a federal, state, private, public, or other entity;

947

948 (iii) Up to four Standard Industrial Classification codes that best reflect the
949 principal products or services provided by the facility;

950

951 (iv) The name, address, and telephone number of the facility;

952

953 (v) The location of the geologic sequestration project identified by section,
954 township, range, and county, noting which sections (if any) include Indian lands;

955

956 (vi) Within the area of review, a listing and status of all permits or construction
957 approvals associated with the geologic sequestration project received or applied for under any of
958 the following programs or corresponding state programs:

959

960 (A) Hazardous Waste Management under the Resource Conservation
961 and Recovery Act, 42 U.S.C. § 6901 *et seq.*;

962

963 (B) UIC Program under the Safe Drinking Water Act, 42 U.S.C. § 300f
964 *et seq.*;

965

966 (C) National Pollutant Discharge Elimination System under the Clean

967 Water Act, 33 U.S.C. § 1251 *et seq.*;

968

969 (D) Prevention of Significant Deterioration program under the Clean
970 Air Act, 42 U.S.C. § 7401 *et seq.*;

971

972 (E) Nonattainment program under the Clean Air Act, 42 U.S.C. § 7401
973 *et seq.*;

974

975 (F) National Emissions Standards for Hazardous Air Pollutants pre-
976 construction approval under the Clean Air Act, 42 U.S.C. § 7401 *et seq.*;

977

978 (G) Dredge and fill permitting program under section 404 of the Clean
979 Water Act, 33 U.S.C. § 1251 *et seq.*;

980

981 (vii) Within the area of review, a list of other relevant permits associated with
982 the geologic sequestration project that the applicant is required to obtain;

983

984 (viii) A statement of whether the geologic sequestration project is within a state-
985 approved water quality management plan area, a state-approved wellhead protection area or a
986 state-approved source water protection area;

987

988 (ix) A map showing the injection well(s) for which a permit is sought and the
989 applicable area of review, consistent with Section 13 of this Chapter;

990

991 (A) Within the area of review, the map shall list the number, or name
992 and location of:

993

994 (I) All injection wells, producing wells, abandoned wells,
995 plugged wells, dry holes, or deep stratigraphic boreholes;

996

997 (II) All state- or EPA-approved subsurface cleanup sites;

998

999 (III) All water quality management plan areas, wellhead
1000 protection areas, and source water protection areas;

1001

1002 (IV) All surface bodies of water, springs, mines (surface and
1003 subsurface), quarries, and water wells;

1004

1005 (V) Other pertinent surface features, including structures
1006 intended for human occupancy;

1007

1008 (VI) Roads; and

1009

1010 (VII) State and Indian reservation boundaries;

1011

1012 (B) The applicant shall include on this map all relevant information of

1013 public record or known to the applicant; and

1014

1015 (C) The map shall also show known or suspected faults;

1016

1017 (x) A map delineating the area of review that:

1018

1019 (A) Meets the requirements of Section 13 of this Chapter;

1020

1021 (B) Is based upon modeling;

1022

1023 (C) Uses all available data, including data available from any logging

1024 and testing of wells within and adjacent to (within one (1) mile of) the area of review; and

1025

1026 (D) Describes the area of review by township, range, and section to the

1027 nearest ten (10) acres, as described under the general land survey system;

1028

1029 (xi) For the description required by W.S. 35-11-313(f)(ii)(A), sufficient

1030 information on the geologic structure and reservoir properties of the proposed storage site and

1031 overlying formations, including:

1032

1033 (A) Isopach maps of the proposed injection and confining zone s, a
1034 structural contour map aligned with the top of the proposed injection zone, and at least two (2)

1035 geologic cross-sections of the area of review reasonably perpendicular to each other and showing
1036 the geologic formations from the surface to total depth;

1037

1038 (B) Location, orientation, and properties of known or suspected faults

1039 and fractures that may transect the confining zone s in the area of review and a determination

1040 that they will not allow fluid movement;

1041

1042 (C) Information on seismic history that has affected the proposed area

1043 of review including knowledge of previous seismic events and history of these events, the

1044 presence and depth of seismic sources, and a determination that the seismicity will not allow

1045 fluid movement;

1046

1047 (D) Data sufficient to demonstrate the effectiveness of the injection

1048 and confining zones, including:

1049

1050 (I) Data on the depth, areal extent, thickness, mineralogy,

1051 porosity, vertical permeability, and capillary pressure of the injection and confining zones within

1052 the area of review; and

1053

1054 (II) A description of geologic changes based on field data that

1055 may include geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic

1056 descriptions;

1057

1058 (E) Geomechanical information on fractures, stress, ductility, rock

1059 strength, and in situ fluid pressures within the confining zone; and

1060

1061 (F) Geologic and topographic maps and cross-sections illustrating
1062 regional geology, hydrogeology, and the geologic structure of the local area;

1063

1064 (xii) A list of all wells and other drill holes within and adjacent to (within one
1065 (1) mile) the area of review. The list shall include a description of each well and drill hole type,
1066 construction, date drilled, location, depth, record of plugging and completion, and any additional
1067 information the Administrator requires;

1068

1069 (xiii) A list of the identity and location of all known wells within and adjacent to
1070 (within one (1) mile) the area of review that penetrate the confining or injection zone;

1071

1072 (xiv) Maps and stratigraphic cross-sections indicating the general vertical and
1073 lateral limits of all USDWs in the area of review; the location of water wells and springs in the
1074 area of review; the positions relative to the injection zones of all USDWS, water wells, and
1075 springs in the area of review, and the direction of water movement (if known);

1076

1077 (xv) For the characterization required by W.S. 35-11-313(f)(ii)(B), information
1078 necessary for the Division to classify the receiver and any secondarily affected aquifers under
1079 Water Quality Rules and Regulations Chapter 8;

1080

1081 (xvi) Baseline geochemical data on subsurface formations, including all
1082 USDWs in the area of review;

1083

1084 (xvii) Proposed operating data, including:

1085

1086 (A) Average and maximum daily rate and volume and mass and total
1087 anticipated volume and mass of the carbon dioxide stream;

1088

1089 (B) Average and maximum surface injection pressure;

1090

1091 (C) The source of the carbon dioxide stream; and

1092

1093 (D) An analysis of the chemical and physical characteristics of the
1094 carbon dioxide stream and any other substances proposed for inclusion in the injectate stream;
1095 and

1096

1097 (E) Anticipated duration of the proposed injection periods;

1098

1099 (xviii) The compatibility of the carbon dioxide stream with fluids in the injection
1100 zone and minerals in both the injection and the confining zones, based on the results of the
1101 formation testing program, and with the materials used to construct the well;

1102

1103 (xix) Proposed formation testing program to obtain an analysis of the chemical
1104 and physical characteristics of the injection zone and confining zone and that meets the

1105 requirements of Section 16 of this Chapter;

1106

1107 (xx) Proposed stimulation program, a description of stimulation fluids to be
1108 used, and a determination that stimulation will not allow fluid movement;

1109

1110 (xxi) Proposed procedure that outlines steps to conduct injection operations;

1111

1112 (xxii) A wellbore schematic of the subsurface construction details and surface
1113 wellhead construction of the injection and monitoring wells;

1114

1115 (xxiii) A demonstration, to the satisfaction of the Administrator, that the injection
1116 wells will be sited in areas with a suitable geologic system that meets the requirements of Section
1117 12(a) of this Chapter, including:

1118

1119 (A) Identification and characterization of additional zones, if they
1120 exist, that will impede vertical fluid movement, allow for pressure dissipation, and provide
1121 additional opportunities for monitoring, mitigation, and remediation; and

1122

1123 (B) Identification of vertical faults and fractures that transect the zones
1124 identified in subparagraph (A) of this subparagraph;

1125

1126 (xxiv) Injection well design and construction procedures that meet the
1127 requirements of Section 14 of this Chapter, including the information listed in Section 14(c)(ii)
1128 of this Chapter;

1129

1130 (xxv) Proposed area of review and corrective action plan that meets the
1131 requirements under Section 13 of this Chapter;

1132

1133 (xxvi) The status of corrective action on wells in the area of review;

1134

1135 (xxvii) All available logging and testing program data on the wells required by
1136 Section 17 of this Chapter;

1137

1138 (xxviii) A demonstration of mechanical integrity required by Section 19 of
1139 this Chapter;

1140

1141 (xxix) A demonstration, satisfactory to the Administrator, that the applicant has
1142 met the financial responsibility requirements of Section 26 of this Chapter;

1143

1144 (xxx) A written financial assurance cost estimate required by Section 26(b) of
1145 this Chapter;

1146

1147 (xxxi) A public liability insurance certificate that, in addition to meeting the
1148 requirements of W.S. § 35-11-313(f)(ii)(O), demonstrates that the public liability insurance
1149 policy meets the requirements of Section 26(1)(i)(B) of this Chapter; identifies each facility by
1150 name, address, and EPA Identification Number; and identifies the amounts and types of coverage

1151 for each facility;

1152

1153 (xxxii) Proposed testing and monitoring plan required by Section 20 of this

1154 Chapter;

1155

1156 (xxxiii) Proposed injection and monitoring wells plugging plan required by

1157 Section 23 of this Chapter;

1158

1159 (xxxiv) Proposed post-injection site care and site closure plan required by

1160 Section 24(a) of this Chapter;

1161

1162 (xxxv) Proposed emergency and remedial response plan required by Section 25 of

1163 this Chapter;

1164

1165 (xxxvi) A list of contacts for Tribes on Indian lands identified pursuant to

1166 subparagraphs (b)(v) and (b)(ix)(A)(VII) of this Section; and

1167

1168 (xxxvii) Any other information requested by the Administrator.

1169

1170 (c) All applications for permits, reports, or information submitted to the

1171 Administrator shall be signed by a responsible corporate officer.

1172

1173 (d) The application shall contain the following certification by the responsible

1174 corporate officer signing the application:

1175

1176 “I certify under penalty of law that this document and all attachments were prepared
1177 under my direction or supervision in accordance with a system designed to ensure that qualified
1178 personnel properly gather and evaluate the information submitted. Based on my inquiry of the
1179 person or persons who manage the system, or those persons directly responsible for gathering the
1180 information, the information submitted is, to the best of my knowledge and belief, true, accurate,
1181 and complete. I am aware that there are significant penalties for submitting false information,
1182 including the possibility of fine and imprisonment for knowing violations.”

1183

1184 (e) Sections of permit applications that represent engineering work shall be sealed,

1185 signed, and dated by a licensed professional engineer as required by W.S. § 33-29-601.

1186

1187 (f) Sections of permit applications that represent geologic work shall be sealed,

1188 signed, and dated by a licensed professional geologist as required by W.S. § 33-41-115.

1189

1190 **Section 11. Prohibitions.**

1191

1192 (a) Pursuant to the provisions of W.S. § 35-11-301(a), no person shall:

1193

1194 (i) Discharge into, construct, operate, or modify any Class VI well unless

1195 permitted pursuant to this Chapter;

1196

1197 (ii) Discharge or inject to any zone except the authorized injection zone as
1198 described in the permit;

1199
1200 (iii) Conduct any injection activity in a manner that results in a violation of any
1201 permit condition or that conflicts with any representations made in a permit application;

1202
1203 (iv) Construct, operate, maintain, convert, plug, abandon, or conduct any other
1204 injection activity in a manner that allows the movement of fluid containing any contaminant into
1205 underground sources of drinking water, if the presence of that contaminant may cause a violation
1206 of any primary drinking water regulation contained in 40 C.F.R. Part 141, Subparts E, F, and G,
1207 or may otherwise adversely affect human health, safety, or the environment;

1208
1209 (v) Inject any hazardous waste that has been banned from land disposal
1210 pursuant to Wyoming Hazardous Waste Rules, Chapter 1;

1211
1212 (vi) Construct a new, operate an existing, or maintain an existing Class V well
1213 for non-experimental geologic sequestration.

1214
1215 (b) Class VI wells shall inject only to receivers classified by the Department pursuant
1216 to Water Quality Rules and Regulations, Chapter 8, as Class V (Hydrocarbon Commercial) or
1217 Class VI groundwaters. No Class VI well shall inject to any Class I, Class II, Class III, Class IV,
1218 or unclassified groundwaters.

1219
1220 (c) The Administrator shall designate and protect as underground sources of drinking
1221 water, all aquifers and parts of aquifers that meet the definition of “underground source of
1222 drinking water” in Section 2 of this Chapter, except to the extent there is expansion to the areal
1223 extent of an existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption
1224 for the exclusive purpose of Class VI injection for geologic sequestration under Section 16 of
1225 this Chapter.

1226
1227 (i) The Administrator may identify underground sources of drinking water by
1228 narrative description, illustrations, maps, or other means.

1229
1230 (ii) Other than EPA-approved aquifer exemption expansions that meet the
1231 requirements of Section 16 of this Chapter, new aquifer exemptions shall not be issued for Class
1232 VI injection wells.

1233
1234 **Section 12. Minimum Criteria for Siting Class VI Wells.**

1235
1236 (a) All Class VI wells shall be sited in areas with a suitable geologic system. The
1237 geologic system shall be comprised of:

1238
1239 (i) An injection zone of sufficient areal extent, thickness, porosity, and
1240 permeability to receive the total anticipated volume of the carbon dioxide stream; and

1241
1242 (ii) Confining zones that are free of transmissive faults or fractures and of

1243 sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced
 1244 formation fluids and allow injection at proposed maximum pressures and volumes without
 1245 initiating or propagating fractures in the confining zones or causing non-transmissive faults to
 1246 become transmissive.

1247
 1248 (b) Owners or operators of Class VI wells shall identify and characterize additional
 1249 zones, if they exist, that will impede vertical fluid movement, allow for pressure dissipation, and
 1250 provide additional opportunities for monitoring, mitigation, and remediation. Faults and fractures
 1251 that transect these zones shall be identified.

1252

1253 **Section 13. Area of Review Delineation and Corrective Action.**

1254

1255 (a) The owner or operator of a Class VI well shall prepare, maintain, and comply
 1256 with a plan to delineate the area of review for a proposed geologic sequestration project, re-
 1257 evaluate the delineation, and perform corrective action that meets the requirements of this
 1258 Section and is approved by the Administrator. The area of review shall be based on
 1259 computational modeling that accounts for the physical and chemical properties of all phases of
 1260 the injected carbon dioxide stream. The area of review shall never be less than the area of
 1261 potentially affected groundwater. An area of review and corrective action plan shall include the
 1262 following information:

1263

1264 (i) The method for delineating the area of review that meets the requirements
 1265 of paragraph (b) of this Section, including the name, version and availability of the model that
 1266 will be used, assumptions that will be made, and the site characterization data on which the
 1267 model will be based;

1268

1269 (ii) A description of:

1270

1271 (A) The monitoring and operational conditions that would warrant a re-
 1272 evaluation of the area of review prior to the next scheduled re-evaluation as determined by the
 1273 minimum fixed frequency established in paragraph (c) of this Section.

1274

1275 (B) How monitoring and operational data (e.g., injection rate and
 1276 pressure) will be used to evaluate the area of review; and

1277

1278 (C) How corrective action will be conducted to meet the requirements
 1279 of paragraph (b)(v) of this Section, including:

1280

1281 (I) What corrective action will be performed prior to injection;

1282

1283 (II) What, if any, portions of the area of review will have
 1284 corrective action addressed on a phased basis and how the phasing will be determined;

1285

1286 (III) How corrective action will be adjusted if there are changes
 1287 in the area of review; and

1288

1289 (IV) How site access will be ensured for future corrective action.

1290

1291 (b) Owners or operators of Class VI wells shall perform the following actions to
1292 delineate the area of review, identify all wells that require corrective action, and perform
1293 corrective action on those wells:

1294

1295 (i) Predict, using existing site characterization, monitoring and operational
1296 data, and computational modeling:

1297

1298 (A) The projected lateral and vertical migration of the carbon dioxide
1299 plume and formation fluids in the subsurface from the commencement of injection activities until
1300 the plume movement ceases;

1301

1302 (B) The pressure differentials, demonstrating that pressure differentials
1303 sufficient to cause the movement of injected fluids or formation fluids into a USDW or to
1304 otherwise threaten human health, safety, or the environment will not be present, or until the end
1305 of a fixed time period determined by the Administrator;

1306

1307 (C) The potential need for brine removal; and

1308

1309 (D) The long-term effects of pressure buildup if brine is not removed.

1310

1311 (ii) Use modeling that:

1312

1313 (A) Is based on:

1314

1315 (I) Detailed geologic data available or collected to characterize
1316 the injection zone, confining zone, and any additional zones; and

1317

1318 (II) Anticipated operating data, including injection pressures,
1319 rates and total volumes over the proposed operational life of the facility;

1320

1321 (B) Takes into account any relevant geologic heterogeneities, other
1322 discontinuities, data quality, and their possible impact on model predictions; and

1323

1324 (C) Considers potential migration through faults, fractures, and
1325 artificial penetrations.

1326

1327 (iii) Using methods approved by the Administrator, identify all penetrations,
1328 including active and abandoned wells and underground mines, in the area of review that may
1329 penetrate the confining zone, and provide a description of each well's type, construction, date
1330 drilled, location, depth, record of plugging and completion, and any additional information the
1331 Administrator may require;

1332

1333 (iv) Determine which abandoned wells in the area of review have been
1334 plugged in a manner that prevents the movement of:

1335
1336 (A) Carbon dioxide that may endanger USDWs or otherwise threaten
1337 human health, safety, or the environment; or
1338

1339 (B) Displaced formation fluids, or other fluids, including the use of
1340 materials compatible with the carbon dioxide stream, that may endanger USDWs or otherwise
1341 threaten human health, safety, or the environment; and
1342

1343 (v) Perform corrective action on any wells in the area of review that the owner
1344 or operator determines require corrective action to prevent the movement of fluid into or between
1345 USDWs including use of materials compatible with the carbon dioxide stream, where
1346 appropriate.
1347

1348 (c) At a fixed frequency, not to exceed two (2) years during the operational life of the
1349 facility or five (5) years during the post-injection site care period (until site closure) as specified
1350 in the area of review and corrective action plan, or when monitoring and operational conditions
1351 warrant, owners or operators shall:
1352

1353 (i) Re-evaluate the area of review in the same manner specified in
1354 subparagraph (b)(i) of this Section;
1355

1356 (ii) Identify all wells in the re-evaluated area of review that require corrective
1357 action in the same manner specified in subparagraph (b)(iv) of this Section;
1358

1359 (iii) Perform corrective action on wells requiring corrective action in the
1360 reevaluated area of review in the same manner specified in subparagraph (b)(v) of this Section;
1361 and
1362

1363 (iv) Submit an amended area of review and corrective action plan, or
1364 demonstrate to the Administrator through monitoring data and modeling results that no change to
1365 the area of review and corrective action plan is needed.
1366

1367 (A) Amendments to the area of review and corrective action plan shall
1368 be subject to approval of the Administrator.
1369

1370 (B) Amendments to the area of review shall be incorporated into the
1371 permit.
1372

1373 (C) Amendments to the area of review are subject to the permit
1374 modification requirements of Section 6 of this Chapter.
1375

1376 **Section 14. Construction and Operation Standards for Class VI Wells.**
1377

1378 (a) The owner or operator shall design, construct, and complete all Class VI wells to
1379 meet the construction standards in this Section and to:
1380

1381 (i) Prevent the movement of fluids into or between USDWs or into any
1382 unauthorized zones;

1383
1384 (ii) Allow the use of appropriate testing devices and workover tools; and
1385

1386 (iii) Allow continuous monitoring of the annulus space between the injection
1387 tubing and long string casing.
1388

1389 (b) Casing and cement or other materials used in the construction of each Class VI
1390 well shall have sufficient structural strength and be designed for the life of the well.
1391

1392 (i) All well materials shall be compatible with fluids with which the materials
1393 may be expected to come into contact and shall meet or exceed the following standards:
1394

1395 (A) American Petroleum Institute Specification 5CT;

1396
1397 (B) American Petroleum Institute RP 5C1;

1398
1399 (C) American Petroleum Institute RP 10B-2;

1400
1401 (D) American Petroleum Institute Specification 10A;

1402
1403 (E) American Petroleum Institute RP 10D-2;

1404
1405 (F) American Petroleum Institute Specification 11D1;

1406
1407 (G) American Petroleum Institute RP 14B; and

1408
1409 (H) American Petroleum Institute RP 14C.
1410

1411 (ii) The casing and cementing program shall be designed to prevent the
1412 movement of fluids into or between USDWs.
1413

1414 (iii) To allow the Administrator to determine and specify casing and cementing
1415 requirements, the owner or operator shall provide the following information in a construction
1416 design plan:
1417

1418 (A) Depth to the injection zone;

1419
1420 (B) Injection pressure, external pressure, internal pressure, and axial
1421 loading;

1422
1423 (C) Hole size;

1424
1425 (D) Size and grade of all casing strings (wall thickness, external
1426 diameter, nominal weight, length, joint specification and construction material), including

1427 whether the casing is new or used;

1428

1429 (E) Corrosiveness of the carbon dioxide stream and formation fluids;

1430

1431 (F) Down-hole temperatures and pressures;

1432

1433 (G) Lithology of injection and confining zones;

1434

1435 (H) Type or grade of cement and additives; and

1436

1437 (I) Quantity, chemical composition, and temperature of the carbon

1438 dioxide stream.

1439

1440 (iv) Casing shall extend through the base of the lowermost USDW above the
1441 injection zone and be cemented to the surface through the use of a single or multiple strings of
1442 casing and cement.

1443

1444 (v) At least one (1) long string casing, using a sufficient number of
1445 centralizers, shall be set to create a cement bond through the overlying and underlying confining
1446 zones.

1447

1448 (A) The long string casing shall:

1449

1450 (I) Extend to the injection zone;

1451

1452 (II) Be cemented by circulating cement to the surface in one (1)

1453 or more stages; and

1454

1455 (III) Be isolated by placing cement or other isolation techniques
1456 as necessary to provide adequate isolation of the injection zone and provide for protection of
1457 USDWs, human health, safety, and the environment.

1458

1459 (B) Circulation of cement may be accomplished by staging. The
1460 Administrator may approve an alternative method of cementing in cases where the cement
1461 cannot be recirculated to the surface if the owner or operator demonstrates by using logs that the
1462 cement does not allow fluid movement behind the wellbore.

1463

1464 (vi) Cement and cement additives shall be suitable for use with the carbon
1465 dioxide stream and formation fluids, and be of sufficient quality and quantity to maintain
1466 integrity over the operating life of the well.

1467

1468 (vii) The integrity and location of the cement shall be verified using technology
1469 capable of evaluating cement quality radially with sufficient resolution to identify the location of
1470 channels, voids, or other areas of missing cement to ensure that USDWs are not endangered and
1471 that human health, safety, and the environment are protected. The owner or operator shall
1472 provide a cement bond log (CBL) to the Administrator with an evaluation, certified by a licensed

1473 professional engineer or a licensed professional geologist, of the following:

1474

1475 (A) Quantitative estimations of the cement compressive strength;

1476

1477 (B) A bond index; and

1478

1479 (C) Qualitative interpretation of the cement-to-formation bond.

1480

1481 (c) All owners and operators of Class VI wells shall inject fluids through tubing with
1482 a packer set at a depth opposite a cemented interval at the location approved by the
1483 Administrator.

1484

1485 (i) Tubing and packer materials used in the construction of each Class VI
1486 well shall be compatible with fluids with which the materials may be expected to come into
1487 contact and shall meet or exceed the following standards:

1488

1489 (A) American Petroleum Institute Specification 5CT;

1490

1491 (B) American Petroleum Institute RP 5C1;

1492

1493 (C) American Petroleum Institute RP 10B-2;

1494

1495 (D) American Petroleum Institute Specification 10A;

1496

1497 (E) American Petroleum Institute RP 10D-2;

1498

1499 (F) American Petroleum Institute Specification 11D1;

1500

1501 (G) American Petroleum Institute RP 14B; and

1502

1503 (H) American Petroleum Institute RP 14C.

1504

1505 (ii) The Administrator shall determine and specify requirements for tubing
1506 and packer based on the following information:

1507

1508 (A) Depth of setting;

1509

1510 (B) Characteristics of the carbon dioxide stream (e.g., chemical
1511 content, corrosiveness, temperature, and density) and formation fluids;

1512

1513 (C) Maximum proposed injection pressure;

1514

1515 (D) Maximum proposed annular pressure;

1516

1517 (E) Maximum proposed injection rate (intermittent or continuous) and
1518 volume of the carbon dioxide stream;

1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564

- (F) Size of tubing and casing; and
- (G) Tubing tensile, burst, and collapse strengths.

Section 15. Class VI Injection Depth Waiver Requirements.

(a) An owner or operator seeking a waiver of the requirement to inject below the lowermost USDW shall submit a supplemental report concurrent with the permit application. The report shall contain the following:

- (i) A demonstration that the injection zones are laterally continuous, are not USDWs, and are not hydraulically connected to USDWs; do not outcrop within the area of review; have adequate injectivity, volume, and sufficient porosity to safely contain the injected carbon dioxide and formation fluids; and have appropriate geochemistry;
 - (ii) A demonstration that the injection zones are bounded by laterally continuous, impermeable confining units above and below the injection zones adequate to prevent fluid movement and pressure buildup outside of the injection zones;
 - (iii) A demonstration that the confining units are free of transmissive faults and fractures;
 - (iv) A characterization of the regional fracture properties and a demonstration that the fractures will not interfere with injection, serve as conduits, or endanger USDWs;
 - (v) A computer model demonstrating that USDWs above and below the injection zone will not be endangered as a result of fluid movement. The modeling shall be done in conjunction with the area of review determination described in Section 13 of this Chapter, is subject to the requirements of Section 13(b) of this Chapter, and shall be periodically reevaluated as required by Section 13(c) of this Chapter;
 - (vi) A demonstration that well design and construction, in conjunction with the waiver, will ensure isolation of the injectate in lieu of the requirements of Section 14(a)(i) of this chapter and will meet the well construction requirements of paragraph (f) of this Section;
 - (vii) A description of how the monitoring and testing and any additional plans will be tailored to this geologic sequestration project to ensure protection of USDWs above and below the injection zone;
 - (viii) Information on the location of all public water supplies affected, reasonably likely to be affected, or served by USDWs in the area of review; and
 - (ix) Any other information requested by the Administrator.
- (b) To inform the EPA Regional Administrator’s decision on whether to grant a

1565 waiver of the injection depth requirements of 40 C.F.R. §§ 144.6, 146.5(f), and 146.86(a)(1), the
1566 Administrator shall submit to the EPA Regional Administrator documentation of the following:

1567
1568 (i) An evaluation of the following information as it relates to siting,
1569 construction, and operation of a geologic sequestration project with a waiver:

1570
1571 (A) The integrity of the upper and lower confining units;

1572
1573 (B) The suitability of the injection zone(s) (including lateral continuity,
1574 lack of transmissive faults and fractures, and knowledge of current or planned artificial
1575 penetrations into the injection zone(s) or formations below the injection zone);

1576
1577 (C) The potential capacity of the geologic formation(s) to sequester
1578 carbon dioxide, accounting for the availability of alternative injection sites;

1579
1580 (D) All other site characterization data, the proposed emergency and
1581 remedial response plan, and a demonstration of financial responsibility;

1582
1583 (E) Community needs, demands, and supply from drinking water
1584 resources;

1585
1586 (F) Planned needs and potential and future use of USDWs and non-
1587 USDW aquifers in the area;

1588
1589 (G) Planned or permitted water, hydrocarbon, or mineral resource
1590 exploitation potential of the proposed injection formation(s) and other formations both above and
1591 below the injection zone to determine if there are any plans to drill through the formation to
1592 access resources in or beneath the proposed injection zone(s) or formation(s);

1593
1594 (H) The proposed plan for securing alternative resources or treating
1595 USDW formation waters in the event of contamination related to the Class VI injection activity;
1596 and

1597
1598 (I) Any other applicable considerations or information requested by
1599 the Administrator;

1600
1601 (ii) Consultation with the public water system supervision directors of all
1602 States and Tribes having jurisdiction over lands within the area of review of a well for which a
1603 waiver is sought; and

1604
1605 (iii) Any written waiver-related information submitted by a public water
1606 system supervision director to the Department.

1607
1608 (c) Concurrent with the Class VI permit application public notice process pursuant to
1609 Section 27 of this Chapter, the Administrator shall give public notice that an injection depth
1610 waiver request has been submitted. The notice shall clearly state:

- 1611
1612 (i) The depth of the proposed injection zone(s);
1613
1614 (ii) The location of the injection wells;
1615
1616 (iii) The name and depth of all USDWs within the area of review;
1617
1618 (iv) A map of the area of review;
1619
1620 (v) The names of any public water supplies affected, reasonably likely to be
1621 affected, or served by the USDWs in the area of review; and
1622
1623 (vi) The results of any consultation between the UIC program and the Public
1624 Water System Supervision Directors within the area of review.
1625
1626 (d) Following the injection depth waiver application public notice, the Administrator
1627 of the Water Quality Division of the Department of Environmental Quality shall provide all the
1628 information received through the waiver application process to the US EPA Regional
1629 Administrator. Based on the information provided, the US EPA Regional Administrator shall
1630 provide written concurrence or non-concurrence regarding waiver issuance.
1631
1632 (i) If the US EPA Regional Administrator requires additional information to
1633 make a decision, the Administrator of the Water Quality Division of the Department of
1634 Environmental Quality shall provide the information. The US EPA Regional Administrator may
1635 require public notice of the new information.
1636
1637 (ii) The Administrator of the Water Quality Division of the Department of
1638 Environmental Quality shall not issue a depth injection waiver without receipt of written
1639 concurrence from the US EPA Regional Administrator.
1640
1641 (e) If an injection depth waiver is issued, within thirty (30) days of issuance, the EPA
1642 shall post the following information on the Office of Water's website:
1643
1644 (i) The depth of the proposed injection zone(s);
1645
1646 (ii) The location of the injection wells;
1647
1648 (iii) The name and depth of all USDWs within the area of review;
1649
1650 (iv) A map of the area of review;
1651
1652 (v) The names of any public water supplies affected, reasonably likely to be
1653 affected, or served by the USDWs in the area of review; and
1654
1655 (vi) The date of waiver issuance.
1656

1657 (f) Upon receipt of a waiver of the requirement to inject below the lowermost USDW
1658 for geologic sequestration, the owner or operator of a Class VI well shall comply with the
1659 following:

1660
1661 (i) All requirements of Sections 13, 17, 18, 19, 22, 23, 25, and 26 of this
1662 Chapter;

1663
1664 (ii) All the requirements of Section 14 of this Chapter with the following
1665 modified requirements:

1666
1667 (A) In lieu of meeting the requirements of Section 14(a)(i) of this
1668 Chapter, the Class VI well shall be constructed and completed to prevent the movement of fluids
1669 into any unauthorized zones, including USDWs;

1670
1671 (B) In lieu of meeting the requirements of Section 14(b) and 14(b)(i) of
1672 this Chapter, the casing and cementing program shall prevent the movement of fluids into any
1673 unauthorized zones including USDWs; and

1674
1675 (C) The casing shall extend through the base of the nearest USDW
1676 directly above the injection zone and shall be cemented to the surface or, at the Administrator's
1677 discretion, at another formation above the injection zone and below the nearest USDW above the
1678 injection zone;

1679
1680 (iii) All the requirements of Section 20 of this Chapter with the following
1681 modified requirements:

1682
1683 (A) The owner or operator shall monitor the groundwater quality,
1684 geochemical changes, and pressure in the first USDWs immediately above and below the
1685 injection zone(s) and in any other formation at the discretion of the Administrator; and

1686
1687 (B) The owner or operator shall conduct testing and monitoring in the
1688 injection zone(s) to track the extent of the carbon dioxide plume and the presence or absence of
1689 elevated pressure (e.g., the pressure front) by using direct methods and indirect methods (e.g.,
1690 seismic, electrical, gravity, or electromagnetic surveys and down-hole carbon dioxide detection
1691 tools) unless the Administrator determines, based on site-specific geology, that such methods are
1692 not appropriate;

1693
1694 (iv) All requirements of Section 24 of this Chapter with the following
1695 modified requirements:

1696
1697 (A) The owner or operator shall monitor the groundwater quality,
1698 geochemical changes and pressure in the first USDWs immediately above and below the
1699 injection zone and in any other formations at the discretion of the Administrator; and

1700
1701 (B) Testing and monitoring in the injection zone(s) to track the extent
1702 of the carbon dioxide plume and the presence or absence of elevated pressure (e.g., the pressure

1703 front) by using direct methods and indirect methods (e.g., seismic, electrical, gravity, or
 1704 electromagnetic surveys and down-hole carbon dioxide detection tools) unless the Administrator
 1705 determines, based on site-specific geology, that such methods are not appropriate; and
 1706

1707 (v) Any additional requirements imposed by the Administrator to ensure
 1708 protection of USDWs above and below the injection zone(s).
 1709

1710 **Section 16. Expansion to the Areal Extent of Existing Class II Injection Well**
 1711 **Aquifer Exemptions for Class VI Injection Wells.**
 1712

1713 (a) The owner or operator of a Class II enhanced oil recovery or enhanced gas
 1714 recovery well that requests an expansion of the areal extent of an existing aquifer exemption for
 1715 the exclusive purpose of Class VI injection for geologic sequestration shall define (by narrative
 1716 description, illustrations, maps, or other means) and describe (in geographic and/or geometric
 1717 terms such as vertical and lateral limits and gradient that are clear and definite) all aquifers or
 1718 parts thereof that are requested to be designated as exempted using the criteria in subparagraphs
 1719 (b)(i)(A)-(C) of this Section.
 1720

1721 (b) The Administrator may consider a request from an owner or operator of permitted
 1722 Class II injection well to convert its well to a Class VI well and expand the areal extent of the
 1723 existing Class II enhanced oil recovery or enhanced gas recovery aquifer exemption for the
 1724 exclusive purpose of Class VI injection for geologic sequestration.
 1725

1726 (i) The Administrator may approve the request if the existing aquifer
 1727 exemption and the well meet the following conditions:
 1728

1729 (A) The groundwater does not currently serve as a source of drinking
 1730 water;
 1731

1732 (B) The total dissolved solids content of the groundwater is more than
 1733 3,000 mg/L and less than 10,000 mg/L; and
 1734

1735 (C) The groundwater is not reasonably expected to supply a public
 1736 water system.
 1737

1738 (ii) The Administrator may approve a request to expand the areal extent of an
 1739 aquifer exemption of a Class II enhanced oil recovery or enhanced gas recovery well for the
 1740 purpose of Class VI injection if the Administrator:
 1741

1742 (A) Determines that the request meets the criteria for exemptions in
 1743 subparagraphs (b)(i)(A)-(C) of this Section;
 1744

1745 (B) Determines that the proposed injection operation will not at any
 1746 time endanger USDWs including non-exempted portions of the injection formation; and
 1747

1748 (C) Considers, in making the determinations required by

1749 subparagraphs (b)(ii)(A)-(B) of this Section, the following:

1750

1751 (I) Current and potential future use of the USDWs to be
1752 exempted as drinking water resources;

1753

1754 (II) The predicted extent of the injected carbon dioxide plume,
1755 and any mobilized fluids that may result in degradation of water quality over the lifetime of the
1756 geologic sequestration project, as informed by computational modeling performed pursuant to
1757 Section 13(b)(i) of this Chapter;

1758

1759 (III) Whether the areal extent of the expanded aquifer exemption
1760 is of sufficient size to account for any possible revisions to the computational model during
1761 reevaluation of the area of review, pursuant to Section 13(c) of this Chapter; and

1762

1763 (IV) Any information submitted to support an injection depth
1764 waiver request pursuant to Section 15 of this Chapter.

1765

1766 (c) Approvals under this Section are not final until:

1767

1768 (i) The Administrator submits the request as a revision to the state-
1769 administered program under 40 C.F.R. Part 147 or as a substantial revision of a state program
1770 under 40 C.F.R. § 145.32; and

1771

1772 (ii) EPA approves the revision.

1773

1774 **Section 17. Logging, Sampling, and Testing Prior to Injection Well Operation.**

1775

1776 (a) During the drilling and construction of a Class VI injection well, the owner or
1777 operator shall run appropriate logs, surveys, and tests to determine or verify the depth, thickness,
1778 porosity, permeability, lithology, and salinity of any formation fluids in all relevant geologic
1779 formations to ensure the well meets the construction requirements of Section 14 of this Chapter
1780 and to establish accurate baseline data against which future measurements may be compared.

1781

1782 The owner or operator shall submit to the Administrator a descriptive report prepared by a
1783 knowledgeable log analyst that includes an interpretation of the results of the logs and tests. At a
1784 minimum, the logs and tests shall include:

1784

1785 (i) Deviation checks measured during drilling on all holes constructed by
1786 drilling a pilot hole that is subsequently enlarged by reaming or another method. Deviation
1787 checks shall be at sufficiently frequent intervals to determine the location of the borehole and to
1788 ensure that vertical avenues for fluid movement in the form of diverging holes are not created
1789 during drilling;

1790

1791 (ii) Before and upon installation of the surface casing:

1792

1793 (A) Resistivity, spontaneous potential, and caliper logs before the
1794 casing is installed; and

- 1795
 1796 (B) A cement bond and variable density log, or other approved device
 1797 to evaluate cement quality radially with sufficient resolution to identify channels, voids, or other
 1798 areas of missing cement and a temperature log after the casing is set and cemented;
 1799
- 1800 (iii) Before and upon installation of the long string casing:
 1801
- 1802 (A) Resistivity, spontaneous potential, porosity, caliper, gamma ray,
 1803 fracture finder logs, and any other logs the Administrator requires for the given geology before
 1804 the casing is installed; and
 1805
- 1806 (B) A cement bond and variable density log, and a temperature log
 1807 after the casing is set and cemented;
 1808
- 1809 (iv) Tests designed to demonstrate the internal and external mechanical
 1810 integrity of injection wells, which may include:
 1811
- 1812 (A) A pressure test with liquid or gas;
 1813
- 1814 (B) A tracer survey, such as oxygen-activation logging;
 1815
- 1816 (C) A temperature or noise log; and
 1817
- 1818 (D) A casing inspection log; and
 1819
- 1820 (v) Any alternative methods that provide equivalent or better information and
 1821 that are required or approved by the Administrator.
 1822
- 1823 (b) The owner or operator shall take whole cores or sidewall cores of the injection
 1824 zone and confining system as well as formation fluid samples from the injection zone(s).
 1825
- 1826 (i) The owner or operator shall submit to the Administrator a detailed report
 1827 prepared by a log analyst that includes:
 1828
- 1829 (A) Well log analyses (including well logs);
 1830
- 1831 (B) Core analyses; and
 1832
- 1833 (C) Formation fluid sample information.
 1834
- 1835 (ii) The Administrator may accept data from cores and fluid samples from
 1836 nearby wells if the owner or operator can demonstrate that such data are representative of
 1837 conditions in the wellbore.
 1838
- 1839 (c) The owner or operator shall record the formation fluid temperature, formation
 1840 fluid pH and conductivity, reservoir pressure, and static fluid level of the injection zone(s).

1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886

(d) The owner or operator shall determine fracture pressures of the injection and confining zones and verify hydrogeologic and geo-mechanical characteristics of the injection zone by conducting a pressure fall-off test, any other test requested by the Administrator, and:

- (i) A pump test; or
- (ii) Injectivity tests.

(e) The owner or operator shall provide the Administrator with the opportunity to witness all logging and testing by this section. The owner or operator shall submit a schedule of such activities to the Administrator prior to conducting the first test and shall notify the Administrator of any changes to the schedule thirty (30) days prior to the next scheduled test.

Section 18. Injection Well Operating Requirements.

(a) The owner or operator shall ensure that injection pressure does not exceed ninety percent (90%) of the fracture pressure of the injection zone(s) to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone(s).

(i) In no case may injection pressure cause movement of injection or formation fluids in a manner that endangers a USDW, or otherwise threatens human health, safety, or the environment.

(ii) In no case may injection pressure initiate fractures in the confining zone s or cause the movement of injectate or formation fluids that endangers a USDW or otherwise threatens human health, safety, or the environment.

(b) Injection of the carbon dioxide stream between the outermost casing protecting USDWs and the wellbore is prohibited.

(c) The owner or operator shall fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Administrator. The owner or operator shall maintain on the annulus a pressure that exceeds the operating injection pressure, unless the Administrator determines that such requirement might harm the integrity of the well or endanger USDWs.

(d) Other than during periods of well workover or maintenance approved by the Administrator in which the sealed tubing-casing annulus is, by necessity, disassembled for maintenance or corrective procedures, the owner or operator shall maintain mechanical integrity of the injection well at all times.

(e) The owner or operator shall install and use continuous recording devices to monitor:

- (i) Injection pressure; and

- 1887
1888 (ii) Injection rate, volume, and temperature of the carbon dioxide stream.
1889
- 1890 (f) The owner or operator shall install and use continuous recording devices to
1891 monitor the pressure on the annulus between the tubing and the long string casing and annulus
1892 fluid volume.
1893
- 1894 (g) The owner or operator shall install, test, and use alarms and automatic surface
1895 shut-off systems or, at the discretion of the Administrator, use down-hole shut-off systems (e.g.,
1896 automatic shut-off, check valves) or other mechanical devices that provide equivalent protection,
1897 designed to alert the operator and shut-in the well when operating parameters such as injection
1898 rate, injection pressure, or other parameters approved by the Administrator diverge beyond
1899 ranges or gradients specified in the permit.
1900
- 1901 (h) If an automatic shutdown is triggered or a loss of mechanical integrity is
1902 discovered, the owner or operator shall immediately investigate and identify as expeditiously as
1903 possible the cause. If, upon such investigation, the well appears to be lacking mechanical
1904 integrity, or if monitoring required under paragraphs (e), (f), and (g) of this Section otherwise
1905 indicates that the well may be lacking mechanical integrity, the owner or operator shall:
1906
- 1907 (i) Immediately cease injection;
1908
- 1909 (ii) Take all steps reasonably necessary to determine whether there may have
1910 been a release of the injected carbon dioxide stream or formation fluids into any unauthorized
1911 zone;
1912
- 1913 (iii) Notify the Administrator within twenty-four (24) hours;
1914
- 1915 (iv) Restore and demonstrate mechanical integrity to the satisfaction of the
1916 Administrator as soon as practicable and prior to resuming injection; and
1917
- 1918 (v) Notify the Administrator when injection can be expected to resume.
1919

1920 **Section 19. Mechanical Integrity.**
1921

- 1922 (a) A Class VI well has mechanical integrity if:
1923
- 1924 (i) There is no significant leak in the casing, tubing, or packer; and
1925
- 1926 (ii) There is no significant fluid movement into a USDW through channels
1927 adjacent to the injection wellbore.
1928
- 1929 (b) To evaluate the absence of significant leaks under subparagraph (a)(i) of this
1930 Section, owners or operators shall, following an initial annulus pressure test, continuously
1931 monitor injection pressure, rate, injected volumes, and pressure on the annulus between tubing,
1932 long string casing, and annulus fluid volume as specified in Section 18(e)-(f) of this Chapter.

1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978

(c) At least once per year, the owner or operator shall use one (1) of the following methods to determine the absence of significant fluid movement under subparagraph (a)(ii) of this Section:

- (i) An approved tracer survey such as an oxygen-activation log; or
- (ii) A temperature or noise log.

(d) If required by the Administrator, at a frequency specified in the testing and monitoring plan required in Section 20 of this Chapter, the owner or operator shall run a casing inspection log to determine the presence or absence of corrosion in the long-string casing.

(e) The Administrator may require any other test to evaluate mechanical integrity under this Section. The Administrator may allow the use of a test to demonstrate mechanical integrity other than those listed in paragraph (c) of this Section with the written approval of the US EPA Administrator. To obtain approval, the Administrator shall submit a written request to the US EPA Administrator that shall set forth the proposed test and all technical data supporting its use.

(f) In conducting and evaluating the tests enumerated in this section or others to be allowed by the Administrator, the owner or operator and the Administrator shall apply methods and standards generally accepted in the industry.

(i) When the owner or operator reports the results of mechanical integrity tests to the Administrator, the owner or operator shall include a description of the test s and the methods used.

(ii) In making an evaluation, the Administrator shall review monitoring and other test data submitted since the previous evaluation.

(g) The Administrator may require additional or alternative tests if the results presented by the owner or operator under paragraph (e) of this Section are not satisfactory to the Administrator to demonstrate that there is no significant leak in the casing, tubing or packer and that there is no significant movement of fluid into or between USDWs resulting from the injection activity.

Section 20. Testing and Monitoring Requirements.

(a) The owner or operator of a Class VI well shall prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The testing and monitoring plan shall be submitted with the permit application, shall be subject to Administrator approval, and shall include a description of how the owner or operator will meet the requirements of this Section, including accessing sites for all necessary monitoring and testing during the life of the project.

1979 (b) In addition to the requirements of W.S. § 35-11-313, testing and monitoring
1980 associated with geologic sequestration projects shall include:

1981
1982 (i) Analysis of the carbon dioxide stream with sufficient frequency to yield
1983 data representative of its chemical and physical characteristics;

1984
1985 (ii) Installation and use, except during well workovers, of continuous
1986 recording devices to monitor:

1987
1988 (A) Injection pressure;

1989
1990 (B) Injection rate and volume;

1991
1992 (C) Pressure on the annulus between the tubing and the long string
1993 casing;

1994
1995 (D) The annulus fluid volume added; and

1996
1997 (E) The pressure on the annulus between the tubing and the long string
1998 casing;

1999
2000 (iii) Corrosion monitoring of the well materials for loss of mass, loss of
2001 thickness, cracking, pitting, and other signs of corrosion, which shall be performed and recorded
2002 at least quarterly to ensure that the well components meet the minimum standards for material
2003 strength and performance set forth in Section 14(b) of this Chapter by:

2004
2005 (A) Analyzing coupons of the well construction materials placed in
2006 contact with the carbon dioxide stream;

2007
2008 (B) Routing the carbon dioxide stream through a loop constructed with
2009 the material used in the well and inspecting the materials in the loop; or

2010
2011 (C) Using an alternative method approved by the Administrator;

2012
2013 (iv) Periodic monitoring of the groundwater quality and geochemical changes
2014 above the confining zones that may be a result of carbon dioxide movement or displaced
2015 formation fluid movement through the confining zones or additional zones. The monitoring wells
2016 shall:

2017
2018 (A) Use specific information about the geologic sequestration project,
2019 including injection rate and volume, geology, the presence of artificial penetrations, and other
2020 relevant factors to establish the location and number of monitoring wells; and

2021
2022 (B) Use baseline geochemical data that have been collected under
2023 Section 10(b)(xvi) of this Chapter and any modeling results in the area of review evaluation
2024 required by Section 13(b) of this Chapter to establish the monitoring frequency and spatial

2025 distribution of monitoring wells;

2026

2027 (v) A demonstration of external mechanical integrity pursuant to Section
2028 19(c) at least once per year until the well is plugged;

2029

2030 (vi) If required by the Administrator, a casing inspection log pursuant to
2031 requirements of Section 19(d) of this Chapter at a frequency established in the testing and
2032 monitoring plan;

2033

2034 (vii) A pressure fall-off test that identifies reservoir conditions with respect to
2035 flow dynamics at least once every five (5) years, unless more frequent testing is required by the
2036 Administrator based on site-specific information;

2037

2038 (viii) Testing and monitoring to track the extent of the carbon dioxide plume,
2039 the position of the pressure front, and surface displacement using:

2040

2041 (A) Direct methods in the injection zone(s); and

2042

2043 (B) Indirect methods in the injection zone (e.g., seismic, electrical,
2044 gravity, or electromagnetic surveys and/or down-hole carbon dioxide detection tools) unless the
2045 Administrator determines, based on site-specific geology, that such methods are not appropriate;

2046

2047 (ix) Based on site-specific conditions, surface air monitoring or soil gas
2048 monitoring to detect movement of carbon dioxide that could endanger a USDW or otherwise
2049 threaten human health, safety, or the environment;

2050

2051 (A) The surface air or soil gas monitoring plan shall:

2052

2053 (I) Be based on potential risks to USDWs, and modeling
2054 within the area of review;

2055

2056 (II) Use baseline data to establish the monitoring frequency and
2057 spatial distribution of surface air monitoring or soil gas monitoring; and

2058

2059 (III) Specify how the proposed monitoring will yield useful
2060 information for the area of review delineation and the potential movement of fluid:

2061

2062 (1.) Containing any contaminant into USDWs in
2063 exceedance of any primary drinking water regulation under 40 C.F.R. Part 141; or

2064

2065 (2.) Which may otherwise adversely affect human
2066 health, safety, or the environment;

2067

2068 (B) If an owner or operator demonstrates that monitoring employed
2069 under 40 C.F.R. §§ 98.440 to 98.449 accomplishes the goals of subparagraph (b)(ix)(A) of this
2070 Section, the Administrator shall approve the use of monitoring employed under 40 C.F.R. §§

2071 98.440 to 98.449. An owner or operator who uses monitoring employed under 40 C.F.R. §§
 2072 98.440 to 98.449 to meet the requirements of this Section shall comply with 40 C.F.R. §§ 98.440
 2073 to 98.449;

2074

2075 (x) Any additional monitoring, as required by the Administrator, necessary to
 2076 support, upgrade, and improve computational modeling of the area of review re-evaluation
 2077 required under Section 13(c) of this Chapter and as necessary to demonstrate that there is no
 2078 movement of fluid containing any contaminant into USDWs in exceedance of any primary
 2079 drinking water regulation under 40 C.F.R. Part 141, Subparts E, F, and G, or which could
 2080 otherwise adversely affect human health, safety, or the environment;

2081

2082 (xi) The owner or operator shall periodically review the testing and monitoring
 2083 plan to incorporate monitoring data collected under this Section, operational data collected under
 2084 Section 18 of this Chapter, and the most recent area of review reevaluation performed under
 2085 Section 13 of this Chapter. The owner or operator shall review the testing and monitoring plan at
 2086 least once every five (5) years. Based on this review, the owner or operator shall submit an
 2087 amended testing and monitoring plan or demonstrate to the Administrator that no amendment to
 2088 the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan
 2089 are subject to approval by the Administrator, shall be incorporated into the permit, and are
 2090 subject to the permit modification requirements of Section 6 of this Chapter. Amended plans or
 2091 demonstrations shall be submitted to the Administrator as follows:

2092

2093 (A) Within one (1) year of an area of review reevaluation;

2094

2095 (B) Following any significant changes to the facility, such as addition
 2096 of monitoring wells or newly permitted injection wells within the area of review; or

2097

2098 (C) When required by the Administrator; and

2099

2100 (xii) A quality assurance and surveillance plan for all testing and monitoring
 2101 requirements.

2102

2103 (c) The owner or operator shall create and retain records of all monitoring
 2104 information that include:

2105

2106 (i) The date, time, and exact place, of sampling or measurements;

2107

2108 (ii) The individuals who performed the sampling or measurements;

2109

2110 (iii) The dates analyses were performed;

2111

2112 (iv) The individuals who performed the analyses;

2113

2114 (v) The analytical techniques or methods used; and

2115

2116 (vi) The results of such analyses.

2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162

Section 21. Record Retention.

- (a) An owner or operator of a Class VI well shall maintain records according to the following schedules:
 - (i) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Administrator at any time;
 - (ii) The nature and composition of all injected fluids until three (3) years after the completion of any plugging and abandonment procedures under Section 23 of this Chapter;
 - (iii) All modeling inputs and data used to support area of review reevaluations under Section 13 of this Chapter shall be retained for ten (10) years;
 - (iv) The well-plugging report required by Section 23 of this Chapter, the site closure report required by Section 24 of this Chapter, and any post-injection site care data, (including data and information used to establish the post-injection site care time frame) shall be retained for ten (10) years following site closure;
 - (v) All data used to complete permit applications shall be retained for the life of the geologic sequestration project and for ten (10) years following site closure; and
 - (vi) All other monitoring records required by a permit shall be retained for a period of ten (10) years following site closure.

Section 22. Reporting and Notice Requirements.

- (a) The owner or operator shall provide the following reports to the Administrator, for each Class VI well:
 - (i) Semi-annual reports. Semi-annual reports required by the permit shall be submitted to the Administrator within thirty (30) days following the end of the period covered in the report and shall contain:
 - (A) Any changes to the physical, chemical, and other relevant characteristics of the carbon dioxide stream from the proposed operating data;
 - (B) Monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;

- 2163
2164 (C) A description of any event that exceeds operating parameters for
2165 annulus pressure or injection pressure as specified in the permit;
2166
2167 (D) A description of any event that triggers a shutdown device required
2168 pursuant to Section 18(g) of this Chapter, and the response taken;
2169
2170 (E) The monthly volume of the carbon dioxide stream injected over the
2171 reporting period and project cumulatively;
2172
2173 (F) Monthly annulus fluid volume added; and
2174
2175 (G) The results of monitoring required by Section 20 of this Chapter;
2176
2177 (ii) Reports, within thirty (30) days of receiving the results, of:
2178
2179 (A) Periodic tests of mechanical integrity;
2180
2181 (B) Any other test of the injection well conducted by the owner or
2182 operator if required by the Administrator; and
2183
2184 (C) Any well workover; and
2185
2186 (iii) Reports, within twenty-four (24) hours, of:
2187
2188 (A) Any evidence that the injected carbon dioxide stream or associated
2189 pressure front may cause an endangerment to a USDW;
2190
2191 (B) Any noncompliance with a permit condition, or malfunction of the
2192 injection system, which may cause fluid migration into or between USDWs;
2193
2194 (C) Any triggering of a shut-off system, either down-hole or at the
2195 surface;
2196
2197 (D) Any release of carbon dioxide to the atmosphere or biosphere
2198 indicated by the surface air or soil gas monitoring or other monitoring technologies required by
2199 Section 14(b)(ix) of this Chapter; and
2200
2201 (E) Any failure to maintain mechanical integrity.
2202
2203 (b) Owners or operators shall notify the Administrator in writing thirty (30) days in
2204 advance of:
2205
2206 (i) Any planned well workover;
2207
2208 (ii) Any planned stimulation activities, other than stimulation for formation

2209 testing conducted under Section 10 of this Chapter; and

2210

2211 (iii) Any other planned test of the injection well conducted by the owner or
2212 operator.

2213

2214 (c) Owners or operators shall submit all required reports, submittals, and notifications
2215 to both the Administrator and to EPA (in an electronic format acceptable to EPA).

2216

2217 (d) Owners or operators shall submit a written report to the Administrator of all
2218 remedial work concerning the failure of equipment or operational procedures that resulted in a
2219 violation of a permit condition at the completion of the remedial work.

2220

2221 (e) For any aborted or curtailed operation, the owner or operator shall submit to the
2222 Administrator a complete report within thirty (30) days of complete termination of the discharge
2223 or associated activity.

2224

2225 **Section 23. Injection Well-plugging.**

2226

2227 (a) Prior to well-plugging, the owner or operator shall flush each Class VI injection
2228 well with a buffer fluid, determine bottom hole reservoir pressure, and perform a final external
2229 mechanical integrity test in accordance with Section 19 of this Chapter.

2230

2231 (b) The owner or operator of a Class VI well shall prepare, maintain, update on the
2232 same schedule as the update to the area of review delineation, and comply with a well-plugging
2233 plan that is approved by the Administrator. The well-plugging plan shall include the following
2234 information:

2235

2236 (i) Appropriate test or measure to determine bottom hole reservoir pressure;

2237

2238 (ii) Appropriate testing methods to ensure final external mechanical integrity
2239 as specified in Section 19 of this Chapter;

2240

2241 (iii) The type and number of plugs to be used;

2242

2243 (iv) The placement of each plug including the elevation of the top and bottom
2244 of each plug;

2245

2246 (v) The type and grade and quantity of material, suitable for use with the
2247 carbon dioxide stream, to be used in plugging; and

2248

2249 (vi) A description of the method of placement of the plugs.

2250

2251 (c) Any amendments to the injection well-plugging plan are subject to approval by
2252 the Administrator, shall be incorporated into the permit if approved, and are subject to the permit
2253 modification requirements of Section 6 of this Chapter.

2254

2255 (d) The owner or operator shall notify the Administrator, in writing, at least sixty (60)
2256 days before plugging a well.

2257
2258 (i) If any changes have been made to the original well-plugging plan, the
2259 owner or operator shall also provide the revised well-plugging plan with notice of its intent to
2260 plug the well.

2261
2262 (ii) The Administrator may allow a shorter notice period.

2263
2264 (e) Within sixty (60) days after completion of plugging and abandonment of a well or
2265 well field, the owner or operator shall submit to the Administrator a final report that includes:

2266
2267 (i) Certification of completion in accordance with approved plans and
2268 specifications by a licensed professional engineer or a licensed professional geologist; and

2269
2270 (ii) Certification of accuracy by the owner or operator and by the person who
2271 performed the plugging operation (if other than the owner or operator).

2272
2273 **Section 24. Post-injection Site Care and Site Closure.**

2274
2275 (a) The owner or operator of a Class VI well shall prepare, maintain, update on the
2276 same schedule as the update to the area of review delineation, and comply with a plan for post-
2277 injection site care and site closure that meets the requirements of subparagraph (a)(ii) of this
2278 Section and is approved by the Administrator.

2279
2280 (i) The post-injection site care and site closure plan is subject to approval by
2281 the Administrator in consultation with EPA.

2282
2283 (ii) The post-injection site care and site closure plan shall include the
2284 following information:

2285
2286 (A) A demonstration containing substantial evidence that the geologic
2287 sequestration project will no longer pose a risk of endangerment to USDWs and will not harm or
2288 present a risk to human health, safety, or the environment at the end of the post-injection site
2289 care timeframe. The demonstration shall be based on significant, site-specific data and
2290 information, including all data and information collected pursuant to Sections 10 and 12 of this
2291 Chapter;

2292
2293 (B) The site closure plan shall address all reclamation, monitoring, and
2294 remediation sufficient to show that the carbon dioxide stream injected into the geologic
2295 sequestration site will not harm human health, safety, the environment, or drinking water
2296 supplies;

2297
2298 (C) Detailed plans for post-injection monitoring, verification,
2299 maintenance, and mitigation;

- 2301 (D) The pressure differential between pre-injection and predicted post-
2302 injection pressures in the injection zone;
2303
- 2304 (E) The predicted position of the carbon dioxide plume and associated
2305 pressure front at the time when plume movement has ceased and pressure differentials sufficient
2306 to cause the movement of injected fluids or formation fluids into a USDW are no longer present,
2307 as demonstrated in the area of review evaluation required under Section 13(b)(i) of this Chapter;
2308
- 2309 (F) A description of post-injection monitoring locations, methods, and
2310 proposed frequency;
2311
- 2312 (G) A proposed schedule for submitting post-injection site care
2313 monitoring results pursuant to Section 22(c) of this Chapter;
2314
- 2315 (H) The duration of the post-injection site care timeframe that ensures
2316 compliance with subparagraph (A) of this paragraph;
2317
- 2318 (I) The results of computational modeling performed pursuant to
2319 delineation of the area of review under Section 13 of this Chapter;
2320
- 2321 (J) The predicted timeframe for pressure decline:
2322
- 2323 (I) Within the injection zone and any other zones such that
2324 formation fluids may not be forced into any USDWs; or
2325
- 2326 (II) To pre-injection pressures;
2327
- 2328 (K) The predicted rate of carbon dioxide plume migration within the
2329 injection zone, and the predicted timeframe for the cessation of migration;
2330
- 2331 (L) A description of the site-specific processes that will result in
2332 carbon dioxide trapping including immobilization by capillary trapping, dissolution, and
2333 mineralization at the site;
2334
- 2335 (M) The predicted rate of carbon dioxide trapping in the immobile
2336 capillary phase, dissolved phase, and mineral phase;
2337
- 2338 (N) The results of laboratory analyses, research studies, and field or
2339 site-specific studies to verify the information required in subparagraphs (J) and (K) of this
2340 paragraph;
2341
- 2342 (O) A characterization of the confining zones including a
2343 demonstration that they are free of transmissive faults, fractures, and micro-fractures and of
2344 appropriate thickness, permeability, and integrity to impede fluid (including carbon dioxide and
2345 formation fluids) movement;
2346

2347 (P) The presence of potential conduits for fluid movement, including
2348 planned injection wells and project monitoring wells associated with the proposed geologic
2349 sequestration project or any other projects in proximity to the predicted or modeled final extent
2350 of the carbon dioxide plume and area of elevated pressure;

2351
2352 (Q) A description of the well construction and an assessment of the
2353 quality of plugs of all abandoned wells within the area of review;

2354
2355 (R) The distance between the injection zone and the nearest USDWs
2356 above and below the injection zone; and

2357
2358 (S) Any additional site-specific factors required by the Administrator.

2359
2360 (iii) Information submitted to support the demonstration in subparagraph (a)(ii)
2361 of this Section shall meet the following criteria:

2362
2363 (A) All analyses and tests performed shall be accurate, reproducible,
2364 and performed in accordance with industry standards;

2365
2366 (B) Estimation techniques shall be appropriate;

2367
2368 (C) EPA-certified test protocols shall be used where available;

2369
2370 (D) Predictive models shall be appropriate and tailored to the site
2371 conditions, composition of the carbon dioxide stream and injection, and site conditions over the
2372 life of the geologic sequestration project;

2373
2374 (E) Predictive models shall be calibrated using existing information
2375 (which may be obtained from Class I, Class II, Class V experimental technology, or Class VI
2376 well sites) where sufficient data are available;

2377
2378 (F) Reasonably conservative values and modeling assumptions shall
2379 be used and disclosed to the Administrator whenever values are estimated on the basis of known,
2380 historical information instead of site-specific measurements;

2381
2382 (G) An analysis shall be performed to identify and assess aspects of the
2383 post-injection site care timeframe demonstration that contribute significantly to uncertainty. The
2384 owner or operator shall conduct sensitivity analyses to determine the effect that significant
2385 uncertainty may contribute to the modeling demonstration;

2386
2387 (H) An approved quality assurance and quality control plan shall
2388 address all aspects of the demonstration; and

2389
2390 (I) Any additional criteria required by the Administrator shall be met.

2391
2392 (iv) Upon cessation of injection, owners or operators of Class VI wells shall

2393 either submit an amended post-injection site care and site closure plan or demonstrate to the
 2394 Administrator through monitoring data and modeling results that no amendment to the plan is
 2395 needed. Any amendments to the post-injection site care and site closure plan shall be:

- 2396
 2397 (A) Subject to approval by the Administrator;
 2398
 2399 (B) Incorporated into the permit; and
 2400
 2401 (C) Subject to the permit modification requirements of Section 6 of
 2402 this Chapter.

2403
 2404 (v) The owner or operator may amend the post-injection site care and site
 2405 closure plan. The owner or operator shall re-submit the post-injection site care and closure plan
 2406 for the Administrator's approval within thirty (30) days of amending the plan.

2407
 2408 (vi) Upon receipt of the Administrator's approval of the post-injection site care
 2409 and site closure plan, the owner or operator shall submit the proposed cost estimate for
 2410 measurement, monitoring, and verification of plume stabilization required by Section 26(i) of
 2411 this Chapter.

2412
 2413 (b) The owner or operator shall monitor the site following the cessation of injection
 2414 to ascertain the position of the carbon dioxide plume and pressure front and demonstrate that
 2415 USDWs are not being endangered.

2416
 2417 (i) The owner or operator shall continue to conduct monitoring as specified in
 2418 the Administrator-approved post-injection site care and site closure plan until the Administrator
 2419 certifies site closure pursuant to Section 24(b)(iii) of this Chapter.

2420
 2421 (ii) The owner or operator may request that the post-injection site care and site
 2422 closure plan be revised to reduce the frequency of monitoring, and the Administrator may
 2423 approve the request if the owner or operator demonstrates that the plan should be revised.

2424
 2425 (iii) Prior to certification of site closure, the owner or operator shall
 2426 demonstrate to the Administrator, based on monitoring, other site-specific data, and modeling
 2427 that is reasonably consistent with site performance, that no additional monitoring is needed to
 2428 ensure that the geologic sequestration project does not, and is not expected to endanger a USDW
 2429 or otherwise threaten human health, safety, or the environment. In addition, the owner or
 2430 operator shall demonstrate, based on the best available understanding of the site including
 2431 monitoring data and modeling, that all other site closure standards and requirements have been
 2432 met.

2433
 2434 (iv) If the owner or operator does not demonstrate that the requirements of
 2435 subparagraph (b)(iii) of this Section have been met, the owner or operator shall continue post-
 2436 injection site care.

2437
 2438 (v) The owner or operator shall notify the Administrator, in writing, at least

2439 120 days before filing a request for site closure. At this time, if any changes have been made to
2440 the original post-injection site care and site closure plan, the owner or operator shall also provide
2441 the revised plan. The Administrator may allow a shorter notice period.

2442
2443 (vi) Post-injection site care shall continue for a period that meets the criteria of
2444 W.S. § 35-11-313(f)(vi)(F).

2445
2446 (c) After the Administrator has certified site closure, the owner or operator shall plug
2447 monitoring wells in a manner approved by the Administrator that will not allow movement of
2448 injection or formation fluids.

2449
2450 (d) The owner or operator shall submit a site closure report within ninety (90) days
2451 after completion of all closure operations. The report shall include:

2452
2453 (i) Documentation of injection and monitoring well-plugging that meets the
2454 requirements of Section 23 of this Chapter and paragraph (c) of this Section

2455
2456 (ii) A copy of a survey plat that has been submitted to the local zoning
2457 authority designated by the Administrator, and:

2458
2459 (A) The plat shall indicate the location of the injection well(s) and
2460 monitoring wells relative to permanently surveyed benchmarks; and

2461
2462 (B) The owner or operator shall also submit a copy of the plat to the
2463 US EPA Regional Administrator;

2464
2465 (iii) Documentation of appropriate notification and information to the State,
2466 local and tribal authorities that have authority over drilling activities to enable them to impose
2467 appropriate conditions on subsequent drilling activities that may penetrate the injection and
2468 confining zones;

2469
2470 (iv) Proof that the owner or operator has:

2471
2472 (A) Published notice of the application for site closure, including a
2473 mechanism to request a public hearing, in a newspaper of general circulation in each county of
2474 the proposed operation at weekly intervals for four (4) consecutive weeks; and

2475
2476 (B) Mailed notice of the application for site closure to all surface
2477 owners, mineral claimants, mineral owners, lessees, and other owners of record of subsurface
2478 interests that are located within one (1) mile of the proposed boundary of the geologic
2479 sequestration site; and

2480
2481 (v) Records of the nature, composition, and volume of the carbon dioxide
2482 stream.

2483
2484 (e) Each owner or operator of a Class VI injection well shall record a notation on the

2485 deed to the facility property or any other document that is normally examined during title search
 2486 that will in perpetuity provide notice to any potential purchaser of the property, and shall file an
 2487 affidavit in accordance with W.S. § 35-11-313(f)(vi)(G), that includes the following information:
 2488

2489 (i) The fact that land has been used to sequester carbon dioxide;
 2490

2491 (ii) The name of the State agency, local authority, or tribe with which the
 2492 survey plat was filed, as well as the address of the EPA regional office to which it was
 2493 submitted; and
 2494

2495 (iii) The volume of fluid injected, the injection zone or zones into which it was
 2496 injected, and the period over which injection occurred.
 2497

2498 **Section 25. Emergency and Remedial Response.**
 2499

2500 (a) All owners or operators of a Class VI well shall develop and maintain an
 2501 emergency and remedial response plan that describes actions to be taken to address movement of
 2502 the injectate or formation fluids that endangers a USDW or threatens human health, safety, or the
 2503 environment during construction, operation, closure, and post-closure periods.
 2504

2505 (i) The emergency and remedial response plan shall be reviewed and updated,
 2506 as necessary, on the same schedule as the update to the area of review delineation.
 2507

2508 (ii) Any amendments to the emergency and remedial response plan shall be
 2509 subject to approval by the Administrator, shall be incorporated into the permit, and are subject to
 2510 the permit modification requirements of Section 6 of this Chapter. Amendments to the
 2511 emergency and remedial response plan shall be submitted to the Administrator as follows:
 2512

2513 (A) Within one (1) year of an area of review reevaluation;
 2514

2515 (B) Following any significant changes to the facility, such as addition
 2516 of injection or monitoring wells; or
 2517

2518 (C) When required by the Administrator.
 2519

2520 (iii) The emergency and remedial response plan shall account for the entire
 2521 area of review delineated pursuant to Section 13 of this Chapter, regardless of whether corrective
 2522 action in the area of review is phased.
 2523

2524 (b) If any monitoring data or other information indicate that any contaminant, the
 2525 injected carbon dioxide stream, displaced formation fluids, or associated pressure front may
 2526 endanger a USDW or threaten human health, safety, or the environment, the owner or operator
 2527 shall:
 2528

2529 (i) Immediately cease injection;
 2530

- 2531 (ii) Take all steps reasonably necessary to identify and characterize any
2532 release;
- 2533
- 2534 (iii) Orally notify the Administrator within twenty-four (24) hours of
2535 discovering the condition; and
- 2536
- 2537 (iv) Provide a written report to the Administrator within five (5) days of
2538 discovering the condition. The written report shall contain:
- 2539
- 2540 (A) A description of the noncompliance and its cause;
- 2541
- 2542 (B) The period of noncompliance, including exact dates and times,
2543 and, if the noncompliance has not been controlled, the anticipated time it is expected to continue;
2544 and
- 2545
- 2546 (C) Steps taken or planned to reduce, eliminate, and prevent
2547 reoccurrence of the noncompliance.
- 2548
- 2549 (c) If an owner or operator discovers any noncompliance with a permit condition or a
2550 requirement of this Chapter that may cause fluid migration into or between USDWs, any
2551 malfunction of the injection system that may cause fluid migration into or between USDWs, or
2552 any excursion, the owner or operator shall:
- 2553
- 2554 (i) Orally notify the Administrator within twenty-four (24) hours of
2555 discovering the condition;
- 2556
- 2557 (ii) Provide a written report to the Administrator within five (5) days of
2558 discovering the condition, which shall contain:
- 2559
- 2560 (A) A description of the noncompliance, malfunction, or excursion and
2561 its cause;
- 2562
- 2563 (B) The period of noncompliance, malfunction, or excursion, including
2564 exact dates and times, and, if the noncompliance, malfunction, or excursion has not been
2565 controlled, the anticipated time it is expected to continue;
- 2566
- 2567 (C) Steps taken or planned to reduce, eliminate, and prevent
2568 reoccurrence of the noncompliance, malfunction, or excursion.
- 2569
- 2570 (iii) If an excursion is discovered, provide written notice to all surface owners,
2571 mineral claimants, mineral owners, lessees, and other owners of record of subsurface interests
2572 within thirty (30) days of discovering the excursion; and
- 2573
- 2574 (iv) Implement the emergency and remedial response plan approved by the
2575 Administrator.
- 2576

2577 (d) The Administrator may allow the owner or operator to resume injection prior to
2578 implementing the emergency and remedial response plan if the owner or operator demonstrates
2579 that the injection operation will not endanger USDWs or otherwise threaten human health,
2580 safety, or the environment.

2581
2582 (e) If any water quality monitoring of a USDW indicates the movement of any
2583 contaminant into the USDW, except as authorized under this Chapter, the Administrator shall
2584 prescribe any additional requirements for construction, corrective action, operation, monitoring,
2585 reporting, or closure of the injection well that are necessary to prevent further movement, and:
2586

2587 (i) If the well responsible for the movement is authorized by permit, these
2588 additional requirements shall be imposed by modifying the permit; or
2589

2590 (ii) The Administrator may terminate or revoke and reissue the permit
2591 pursuant to Section 7 of this Chapter.
2592

2593 **Section 26. Financial Responsibility.**
2594

2595 (a) Owners or operators of Class VI wells shall establish, demonstrate, and maintain
2596 financial responsibility for all applicable phases of the geologic sequestration project, including
2597 complete site reclamation in the event of default. The phases of a geologic sequestration project
2598 are:

2599 (i) Permitting/characterization;
2600

2601 (ii) Testing and monitoring, pursuant to Section 20 of this Chapter;
2602

2603 (iii) Operations, including injection and well-plugging, pursuant to Sections 18
2604 and 23 of this Chapter;
2605

2606 (iv) Post-injection site care, including plume stabilization, monitoring,
2607 measurement, verification, corrective action, and other actions needed to ensure that
2608 underground sources of drinking water are not endangered from the time of well-plugging until
2609 site closure is certified by the Administrator and above ground-reclamation is completed,
2610 pursuant to Section 24 of this Chapter; and
2611

2612 (v) Emergency and remedial response pursuant to Section 25 of this Chapter.
2613
2614

2615 (b) The owner or operator shall develop and annually update in accordance with
2616 paragraph (f) of this Section, a written financial assurance cost estimate.
2617

2618 (i) The financial assurance cost estimate shall include the cost in current
2619 dollars of:

2620 (A) Performing corrective action on other wells in the area of review
2621 that require corrective action under Section 13 of this Chapter;
2622

- 2623
2624 (B) Plugging the injection wells under Section 23 of this Chapter;
2625
2626 (C) Post-injection site care and site closure under Section 24 of this
2627 Chapter;
2628
2629 (D) Testing and monitoring under Section 20 of this Chapter; and
2630
2631 (E) Emergency and remedial response under Section 25 of this
2632 Chapter.
2633
2634 (ii) The financial assurance cost estimate shall consider the following events:
2635
2636 (A) Contamination of underground sources of water including,
2637 drinking water supplies;
2638
2639 (B) Mineral rights infringement;
2640
2641 (C) Single large-volume release of carbon dioxide that impacts human
2642 health and safety or that causes ecological damage;
2643
2644 (D) Low-level leakage of carbon dioxide to the surface that impacts
2645 human health and safety or that causes ecological damage;
2646
2647 (E) Storage rights infringement;
2648
2649 (F) Property and infrastructure damage, including changes to surface
2650 topography and structures;
2651
2652 (G) Entrained contaminant releases of contaminants other than carbon
2653 dioxide;
2654
2655 (H) Accidents and unplanned events;
2656
2657 (I) Well capping and permitted abandonment; and
2658
2659 (J) Removal of above-ground facilities and site reclamation.
2660
2661 (iii) The owner or operator shall consider the Risk Activity Matrix in
2662 Appendix A of this Chapter to develop the financial assurance cost estimate.
2663
2664 (iv) The financial assurance cost estimate shall be based upon a multi-
2665 disciplinary analytical framework such as Monte Carlo or other commonly accepted stochastic
2666 modeling tools.
2667
2668 (A) Cost curves shall combine risk probabilities, event outcomes, and

2669 damages assessment to calculate expected losses under a series of events.

2670

2671 (B) For all cases of potential damages, the probability distributions
2672 should be identified for 50 percent, 95 percent, and 99 percent probabilities of occurrence.

2673

2674 (v) The owner or operator shall perform the financial assurance cost estimate
2675 for each phase separately.

2676

2677 (vi) The owner or operator shall base the financial assurance cost estimate on
2678 the costs to the regulatory agency of hiring a third party (that is not within the corporate structure
2679 of the owner or operator) to perform the required activities.

2680

2681 (vii) The financial assurance cost estimate shall account for the entire area of
2682 review delineated pursuant to Section 13 of this Chapter.

2683

2684 (viii) The owner or operator shall submit an updated financial assurance cost
2685 estimate to the Administrator annually within thirty (30) days of the anniversary date when the
2686 original financial assurance cost estimate was submitted.

2687

2688 (c) The financial responsibility instruments used shall be from the following list of
2689 qualifying instruments and shall be submitted on a Wyoming Department of Environmental
2690 Quality form:

2691

(i) Irrevocable Trust Funds with government-backed securities;

2693

(ii) Surety Bonds;

2695

(iii) Irrevocable Letter of Credit;

2697

(iv) Cash; or

2699

(v) Federally Insured Certificates of Deposit.

2701

2702 (d) The qualifying instruments shall be sufficient to cover the cost of the financial
2703 assurance cost estimate required in paragraph (b) of this Section.

2704

2705 (e) The qualifying financial responsibility instruments shall comprise protective
2706 conditions of coverage that include at a minimum cancellation, renewal, continuation provisions,
2707 specifications on when the provider becomes liable following a notice of cancellation, and
2708 requirements for the provider to meet a minimum rating, minimum capitalization, and the ability
2709 to pass the bond rating test when applicable.

2710

2711 (i) An owner or operator shall provide that their financial mechanism may not
2712 cancel, terminate or fail to renew except for failure to pay such financial instrument.

2713

2714 (A) If there is a failure to pay the financial instrument, the financial

2715 institution may elect to cancel, terminate, or fail to renew the instrument by sending notice by
2716 certified mail to the owner or operator and the Director;

2717
2718 (B) The cancellation shall not be final for 120 days after receipt of
2719 cancellation notice;

2720
2721 (C) Within sixty (60) days of notice of cancellation, the owner or
2722 operator shall provide to the Director an alternate financial responsibility demonstration that
2723 meets the requirements of paragraphs (c), (d), (e), (f), and (g) of this Section; and

2724
2725 (D) If an alternate financial responsibility demonstration is not
2726 acceptable (or possible), any funds from the instrument being cancelled shall be released within
2727 sixty (60) days of notification by the Director.

2728
2729 (ii) Owners or operators shall renew all financial instruments, if an instrument
2730 expires, for the entire term of the geologic sequestration project. The instrument may be
2731 automatically renewed as long as, at a minimum, the owner or operator has the option of renewal
2732 at the face amount of the expiring instrument.

2733
2734 (iii) Cancellation, termination, or failure to renew may not occur and the
2735 financial instrument shall remain in full force and effect in the event that on or before the date of
2736 expiration:

2737
2738 (A) The Administrator deems the facility abandoned.

2739
2740 (B) The permit is terminated, revoked, or a new permit is denied.

2741
2742 (C) Closure is ordered by the Administrator, a U.S. district court, or
2743 other court of competent jurisdiction.

2744
2745 (D) The owner or operator is named as debtor in a voluntary or
2746 involuntary proceeding under Title 11 (Bankruptcy), U.S. Code.

2747
2748 (E) The amount due is paid.

2749
2750 (f) The qualifying financial responsibility instruments are subject to approval by the
2751 Director. The use and length of pay-in-periods for trust funds and escrow accounts are also
2752 subject to approval by the Director.

2753
2754 (i) No Class VI permit shall be issued until and unless the Director has
2755 considered and approved the financial responsibility demonstration for all phases of the geologic
2756 sequestration project.

2757
2758 (ii) The Director may negotiate a satisfactory financial responsibility
2759 demonstration or deny a demonstration.

2760

2761 (iii) The owner or operator shall provide any updated information related to
2762 financial responsibility instruments on an annual basis, and if there are any changes, the Director
2763 shall evaluate the financial responsibility demonstration and determine whether the instruments
2764 used are adequate. The owner or operator shall maintain financial responsibility requirements
2765 regardless of the status of the Director's review of the financial responsibility demonstration.
2766

2767 (iv) The owner or operator shall provide an adjustment of the financial
2768 assurance cost estimate to the Administrator within sixty (60) days of receiving notice that the
2769 Administrator has determined that a demonstration of financial assurance is not adequate to
2770 cover the cost of corrective action, injection well-plugging, post-injection site care and site
2771 closure, and emergency and remedial response.
2772

2773 (v) During all phases of the geologic sequestration project, the owner or
2774 operator shall adjust the financial assurance cost estimate for inflation within sixty (60) days
2775 prior to the anniversary date of the establishment of the financial instruments used to comply
2776 with this Section and provide this adjustment to the Administrator. The owner or operator shall
2777 also provide to the Administrator written updates of adjustments to the cost estimate within sixty
2778 (60) days of any amendments to the area of review and corrective action plan, the injection well-
2779 plugging plan, the post-injection site care and site closure plan, the emergency and remedial
2780 response plan, and mitigation or reclamation costs that the State may incur as a result of any
2781 default by the permit holder.
2782

2783 (vi) Any decrease or increase to the financial assurance cost estimate shall be
2784 subject to approval by the Administrator. During all phases of the geologic sequestration project,
2785 the owner or operator shall revise the cost estimate no later than sixty (60) days after the
2786 Administrator has approved a request to modify the area of review and corrective action plan, the
2787 injection well-plugging plan, the post-injection site care and site closure plan, or the emergency
2788 and response plan, if the change in the plan increases the cost. If the change to the plan decreases
2789 the cost, any withdrawal of funds is subject to approval by the Administrator. Any decrease to
2790 the value of the financial assurance instrument is subject to approval by the Administrator.
2791

2792 (vii) Whenever the current financial assurance cost estimate increases to an
2793 amount greater than the face amount of a financial instrument currently in use, the owner or
2794 operator, within sixty (60) days after the increase, shall either cause the face amount to be
2795 increased to an amount at least equal to the current financial assurance cost estimate and submit
2796 evidence of such increase to the Administrator, or the owner or operator shall obtain other
2797 financial responsibility instruments to cover the increase. Whenever the current financial
2798 assurance cost estimate decreases, the face amount of the financial assurance instrument may be
2799 reduced to the amount of the current financial assurance cost estimate only after the owner or
2800 operator has received written approval from the Administrator.
2801

2802 (g) The owner or operator may demonstrate financial responsibility by using one (1)
2803 or multiple qualifying financial instruments subject to the following requirements:
2804

2805 (i) Owners or operators that propose to demonstrate financial assurance with
2806 surety bonds shall meet the following requirements:

2807
2808 (A) A corporate surety shall not be considered good and sufficient
2809 unless:
2810
2811 (I) It is licensed to do business in the State;
2812
2813 (II) The estimated bond amount does not exceed the limit of
2814 risk as provided for in W.S. § 26-5-110, nor raise the total of all bonds held by the applicant
2815 under that surety above three (3) times the limit of risk; and
2816
2817 (III) The surety agrees:
2818
2819 (1.) Not to cancel bond unless the Department gives
2820 prior written approval of a good and sufficient replacement surety with transfer of the liability
2821 that has accrued against the operator on the permit area, site, or facility;
2822
2823 (2.) To be jointly and severally liable with the permittee,
2824 owner, or operator.
2825
2826 (3.) To provide immediate written notice to the
2827 Department and operator once it becomes unable or may become unable due to any action filed
2828 against it to fulfill its obligations under the bond.
2829
2830 (B) If for any reason the surety becomes unable to fulfill its obligations
2831 under the bond, the operator shall provide the required notice. Failure to comply with this
2832 provision shall result in suspension of the permit.
2833
2834 (C) The surety bond shall be submitted on a Wyoming Department of
2835 Environmental Quality form.
2836
2837 (ii) Owners or operators that propose to demonstrate financial assurance with
2838 cash, or government securities, or a combination of both, shall meet the following requirements:
2839
2840 (A) Securities that are unencumbered shall only include those that are
2841 United States government securities or state government securities that are acceptable to the
2842 Director. Government securities shall be endorsed to the order of the Department and placed in
2843 possession of the Department. Possession shall be in the form of the cash value of the irrevocable
2844 trust for the full amount of the reclamation obligation and payable to the Department and
2845 federally insured.
2846
2847 (B) An owner or operator shall satisfy the requirements of this
2848 subsection by establishing an irrevocable trust that conforms to the requirements below and
2849 submitting an originally signed duplicate of the trust agreement to the Director for consideration.
2850
2851 (I) The irrevocable trust shall be submitted to the Director on
2852 the Wyoming Department of Environmental Quality Irrevocable Trust Form and be signed by

2853 the owner, operator, or guarantor as principal and the financial institution as Trustee, and made
2854 payable to the Department;

2855
2856 (II) The Trustee shall be a bank organized to do business in the
2857 United States that has the authority to act as a trustee and whose trust operations is regulated and
2858 examined by a federal agency;

2859
2860 (III) The irrevocable trust shall be cash funded for the full
2861 amount of the financial assurance obligation to be provided in the irrevocable trust before it may
2862 be approved to satisfy the requirements of financial assurance in lieu of a bond. For purposes of
2863 this subsection, “the full amount of the financial assurance obligation to be provided” means the
2864 amount of coverage required to be provided by paragraphs (b) and (i) of this Section, less the
2865 amount of financial assurance obligation that is being provided by other financial assurance
2866 mechanisms being used to demonstrate financial assurance by the owner, operator, or guarantor;

2867
2868 (IV) Any bond may be canceled by the surety only after ninety
2869 (90) days written notice to the Director, and upon receipt of the Director’s written consent, which
2870 may be granted only when the requirements of the irrevocable trust have been fulfilled; and

2871
2872 (V) Irrevocable trust forfeiture proceedings shall occur only
2873 after the Department provides notice to the owner or operator and trustee pursuant to W.S. 35-
2874 11-701 that a violation exists and the Environmental Quality Council has approved the request of
2875 the Director to begin forfeiture proceedings.

2876
2877 (iii) Owners or operators that propose to demonstrate financial assurance with
2878 irrevocable letters of credit shall meet the following conditions:

2879
2880 (A) The irrevocable letter of credit shall be payable to the Department
2881 in part or in full upon demand and receipt from the Director of a notice of forfeiture issued in
2882 accordance with paragraph (t) of this Section;

2883
2884 (B) The irrevocable letter of credit shall not be in excess of ten percent
2885 of the issuing or supporting bank’s capital surplus account as shown on a balance sheet liabilities
2886 certified by a certified public accountant;

2887
2888 (C) The Director shall not accept standby letters of credit;

2889
2890 (D) The Director shall not accept letters of credit from a bank for any
2891 person, on all permits held by that person, in excess of the limitations imposed by W.S. §13-3-
2892 402; and

2893
2894 (E) The irrevocable letter of credit shall provide that:

2895
2896 (I) The bank will give prompt notice to the owner or operator
2897 and the Director of any notice received or action filed alleging the insolvency or bankruptcy of
2898 the bank or alleging any violations of regulatory requirements that could result in suspension or

2899 revocation of the bank's charter or license to do business;

2900

2901 (II) In the event the bank becomes unable to fulfill its
2902 obligations under the letter of credit for any reason, notice shall be given immediately to the
2903 owner or operator and the Director; and

2904

2905 (III) Upon the incapacity of a bank by reason of bankruptcy,
2906 insolvency, or suspension or revocation of its charter or license, the owner or operator shall be
2907 deemed to be without performance bond coverage in violation of the Act. The Director shall
2908 issue a notice of violation against any owner or operator who is without bond coverage,
2909 specifying a reasonable period to replace bond coverage, not to exceed ninety (90) days. During
2910 this period the Director or the Director's designated representative shall conduct weekly
2911 inspections to ensure continuing compliance with other permit requirements, the regulations and
2912 the Act. If the notice is not abated in accordance with the schedule, a cessation order shall be
2913 issued.

2914

2915 (IV) The irrevocable letter of credit may be cancelled by the
2916 surety only after ninety (90) days notice to the Director, and upon receipt of the Director's
2917 written consent, which may be granted only when the requirements of the bond have been
2918 fulfilled.

2919

2920 (F) The irrevocable letter may only be issued by a bank organized to
2921 do business in the U.S. that identifies by name, address, and telephone number an agent upon
2922 whom any process, notice or demand required or permitted by law to be served upon the bank
2923 may be served.

2924

2925 (I) If the bank fails to appoint or maintain an agent in this
2926 State, or whenever any such agent cannot be reasonably found, then the Director shall be an
2927 agent for such bank upon whom any process, notice or demand may be served for the purpose of
2928 this Chapter. In the event of any such process, the Director shall immediately cause one copy of
2929 such process, notice or demand to be forwarded by registered mail to the bank at its principal
2930 place of business. The Director shall keep a record of all processes, notices, or demands served
2931 upon him under this paragraph, and shall record therein the time of such service and his action
2932 with reference thereto.

2933

2934 (II) Nothing herein contained shall limit or affect the right to
2935 serve any process, notice or demand required or permitted by law to be served upon the bank in
2936 any other manner now or hereafter permitted by law.

2937

2938 (h) The owner or operator shall maintain financial responsibility and resources until:

2939

2940 (i) The Administrator receives the site closure report and certifies site
2941 closure.

2942

2943 (A) When the conditions of W.S. § 35-11-313(f)(vi)(F) have been met,
2944 the owner or operator may submit a written request to the Administrator to release the retained

2945 financial assurance instruments; and

2946

2947 (B) The Administrator shall evaluate the request within sixty (60) days
2948 of the receipt of the financial assurance release request.

2949

2950 (I) If the Administrator finds the owner or operator has
2951 demonstrated the requirements of W.S. § 35-11-313(f)(vi)(F) have been met, the Administrator
2952 shall prepare a draft recommendation to the Director to approve the request and provide public
2953 notice pursuant to Section 27 of this Chapter.

2954

2955 (II) Re-submittal of information by an operator for an
2956 incomplete demonstration of the requirements of W.S. § 35-11-313(f)(vi)(F) will restart the
2957 process described in this subsection.

2958

2959 (III) If the Administrator finds the owner or operator has not
2960 demonstrated the requirements of W.S. § 35-11-313(f)(vi)(F) have been met, the Administrator
2961 shall prepare a draft recommendation to the Director to deny the request.

2962

2963 (C) After receiving public comment and holding a hearing (if a hearing
2964 is held) pursuant to Section 27 of this Chapter, the Director shall determine whether the operator
2965 has demonstrated the requirements of W.S. § 35-11-313(f)(vi)(F) have been met.

2966

2967 (I) If the Director finds the owner or operator has
2968 demonstrated the requirements of W.S. § 35-11-313(f)(vi)(F) have been met, the Director shall
2969 notify the owner or operator and request the State Treasurer to release that portion of the final
2970 financial assurance instruments. The State Treasurer shall then return the financial assurance
2971 instruments constituting that portion of the financial assurance so retained.

2972

2973 (II) If the Director finds the owner or operator has not
2974 demonstrated the requirements of W.S. § 35-11-313(f)(vi)(F) have been met, the Director shall
2975 notify the owner or operator by registered mail within a reasonable time after the request is filed.
2976 The notice shall state the reasons for denial and shall recommend corrective actions.

2977

2978 (ii) The owner or operator meets the requirements for release from a financial
2979 instrument in the following circumstances:

2980

2981 (A) The owner or operator has completed the phase of the geologic
2982 sequestration project for which the financial instrument was required and has fulfilled all its
2983 financial obligations as determined by the Director, including obtaining financial responsibility
2984 for the next phase of the geologic sequestration project, if required;

2985

2986 (B) The owner or operator has submitted a replacement financial
2987 instrument and received written approval from the Director accepting the new financial
2988 instrument and releasing the owner or operator from the previous financial instrument; or

2989

2990 (C) The owner or operator has submitted a revised financial assurance

2991 cost estimate for the remaining phases of the geologic sequestration project. The revised
 2992 financial assurance cost estimate may demonstrate that a partial release of the financial
 2993 instrument is warranted and will still provide adequate financial assurance for the remainder of
 2994 the geologic sequestration project. Partial release of the financial instrument is at the discretion
 2995 of the Director.

2996
 2997 (i) Within a reasonable time following certification of site closure by the
 2998 Administrator, plume stabilization, the completion of all remediation work, and release of all
 2999 other financial assurance instruments, the owner or operator shall submit a proposed cost
 3000 estimate for measurement, monitoring, and verification of plume stabilization. The Administrator
 3001 shall evaluate and determine whether the proposed cost estimate is adequate.

3002
 3003 (j) The owner or operator shall notify the Director by certified mail of adverse
 3004 financial conditions, such as bankruptcy, that may affect its ability to complete injection well-
 3005 plugging and post-injection site care and site closure.

3006
 3007 (i) The owner or operator shall notify the Director by certified mail of the
 3008 commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S.
 3009 Code, naming the owner or operator or the third-party provider of a financial responsibility
 3010 instrument as debtor, within ten (10) days after commencement of the proceeding.

3011
 3012 (ii) An owner or operator who fulfills the requirements of this Section by
 3013 obtaining an irrevocable trust fund, surety bond, or irrevocable letter of credit shall be deemed to
 3014 be without the required financial assurance in the event of:

3015
 3016 (A) Bankruptcy of the trustee or issuing institution;

3017
 3018 (B) A suspension or revocation of the authority of the trustee
 3019 institution to act as trustee of the institution issuing the irrevocable trust fund, surety bond, or
 3020 irrevocable letter of credit; or

3021
 3022 (C) If the license to do business in Wyoming of the surety issuing
 3023 financial assurance is suspended or revoked.

3024
 3025 (iii) Within sixty (60) days after such an event the owner or operator shall
 3026 establish other financial assurance that meets the requirements of paragraphs (c), (d), (e), (f), and
 3027 (g) of this Section.

3028
 3029 (k) The Department shall conduct bond forfeiture proceedings pursuant to W.S. § 35-
 3030 11-421. If the forfeited financial assurance instrument is inadequate to cover the costs of the
 3031 closure, mitigation, reclamation, measurement, monitoring, verification, and pollution control,
 3032 the Department may request that the Attorney General bring suit to recover costs against the
 3033 owner, operator, or permittee.

3034
 3035 (l) The owner or operator shall obtain and maintain public liability insurance for a
 3036 geologic sequestration project.

3037
3038
3039
3040
3041
3042
3043
3044
3045
3046
3047
3048
3049
3050
3051
3052
3053
3054
3055
3056
3057
3058
3059
3060
3061
3062
3063
3064
3065
3066
3067
3068
3069
3070
3071
3072
3073
3074
3075
3076
3077
3078
3079
3080
3081
3082

- (i) The public liability insurance policy shall:
 - (A) Include coverage for the major risks identified in Appendix A to this Chapter;
 - (B) Provide minimum coverage that:
 - (I) Accounts for site-specific risk factor and bond adjustment factor calculations, based on the previous year’s information; and
 - (II) Is at least \$15 million per occurrence with an annual aggregate of at least \$45 million, exclusive of legal defense costs; and
 - (C) Include a rider that requires the insurer to notify the Administrator whenever substantive changes are made to the policy, including any termination or failure to renew.
- (ii) The owner or operator shall recalculate the minimum coverage amount of the public liability insurance policy annually and at the same time that the owner or operator updates the financial assurance cost estimate pursuant to paragraph (b) of this Section. The owner or operator shall submit a copy of the current public liability insurance policy annually and at the same time that the owner or operator submits an updated financial assurance cost estimate pursuant to subparagraph (b)(viii) of this Section.
- (iii) The owner or operator shall maintain the public liability insurance policy until the Administrator certifies that plume stabilization has been achieved.

Section 27. Public Participation, Public Notice and Public Hearing Requirements.

- (a) The Administrator shall give public notice if a draft permit has been prepared, after receiving a financial assurance release request pursuant to Section 26(h)(i)(A) of this Chapter and finding the operator has met the requirements of W.S. 35-11-313(f)(vi)(F), or if a hearing has been scheduled.
 - (i) Public notice of the preparation of a draft permit shall allow at least sixty (60) days for public comment.
 - (ii) Public notice of a hearing or recommendation to release financial assurance after certifying site closure shall be given at least thirty (30) days before the hearing.
 - (iii) Public notice of a hearing may be given at the same time as public notice of the draft permit or of a draft recommendation to release financial assurance after certifying site closure, and the two notices may be combined.
- (b) Public notice shall be given by:

- 3083
3084 (i) Providing a copy of the notice, a copy of the fact sheet, the permit
3085 application (if any), and the draft permit (if any) to the following persons:
3086
3087 (A) The applicant, by certified or registered mail;
3088
3089 (B) The U.S. Environmental Protection Agency, Region 8 Drinking
3090 Water Program, by mail;
3091
3092 (C) The U.S. Environmental Protection Agency, Underground
3093 Injection Control Program, by mail;
3094
3095 (D) Wyoming Game and Fish Department;
3096
3097 (E) Wyoming State Engineer;
3098
3099 (F) State Historical Preservation Officer;
3100
3101 (G) Wyoming Oil and Gas Conservation Commission;
3102
3103 (H) Wyoming Department of Environmental Quality, Land Quality
3104 Division;
3105
3106 (I) Wyoming State Geological Survey;
3107
3108 (J) Wyoming Water Development Office;
3109
3110 (K) Wyoming Department of Environmental Quality, Air Quality
3111 Division;
3112
3113 (L) Wyoming Department of Environmental Quality, Solid and
3114 Hazardous Waste Division; and
3115
3116 (M) U.S. Army Corps of Engineers;
3117
3118 (N) Federal agencies with jurisdiction over fish, shellfish, and wildlife
3119 resources and over coastal zone management plans;
3120
3121 (O) The Advisory Council on Historic Preservation;
3122
3123 (P) Any Tribes with Indian reservations and Indian lands identified
3124 pursuant to Sections 10(b)(v) and 10(b)(ix)(A)(VII) of this Chapter;
3125
3126 (Q) Persons on the mailing list developed by the Department, including
3127 those who request in writing to be on the list and participants in hearings in that area who request
3128 to be on “area” mailing lists; and

- 3129
3130 (R) Any unit of local government having jurisdiction over the area
3131 where the facility is proposed to be located.
3132
- 3133 (ii) Publishing the notice in a newspaper of general circulation in the location
3134 of the facility or operation; and
3135
- 3136 (iii) At the discretion of the Administrator, any other method reasonably
3137 expected to give actual notice of the proposed action to the persons potentially affected by it,
3138 including press releases or any other forum or medium to elicit public participation.
3139
- 3140 (c) All public notices issued under this chapter shall contain the following minimum
3141 information:
3142
- 3143 (i) Name and address of the Department;
3144
- 3145 (ii) Name and address of the owner, operator, permittee, or permit applicant,
3146 and, if different, of the facility or activity regulated by the permit;
3147
- 3148 (iii) A brief description of the business conducted at the facility or activity
3149 described in the permit application, described in the draft permit, or subject to regulation under
3150 this Chapter;
3151
- 3152 (iv) The type and quantity of wastes, fluids, or pollutants that are proposed to
3153 be or are being treated, stored, disposed of, injected, emitted, or discharged;
3154
- 3155 (v) A brief summary of the basis for the draft permit conditions, including
3156 references to applicable statutory or regulatory provisions;
3157
- 3158 (vi) Reasons why any requested variances or alternatives to required standards
3159 do or do not appear justified;
3160
- 3161 (vii) Name, address and telephone number of a person from whom interested
3162 persons may obtain further information, including copies of the draft permit, statement of basis,
3163 fact sheet, and the application; and
3164
- 3165 (viii) A brief description of comment procedures, including:
3166
- 3167 (A) Procedures to request a hearing;
3168
- 3169 (B) The beginning and ending dates of the comment period;
3170
- 3171 (C) The address where comments may be submitted; and
3172
- 3173 (D) Other procedures that the public may use to participate in the final
3174 permit decision.

3175
3176 (d) In addition to the information required in paragraph (c) of this Section, any notice
3177 for a hearing shall contain the following:

3178
3179 (i) Reference to the date of previous public notices relating to the permit;

3180
3181 (ii) Date, time, and place of hearing; and

3182
3183 (iii) A brief description of the nature and purpose of the hearing, including
3184 applicable rules and procedures.

3185
3186 (e) The Department shall provide an opportunity for the applicant, permittee, owner,
3187 operator, or any interested person to submit written comments regarding any aspect of a permit
3188 or to request a hearing.

3189
3190 (i) During the public comment period, any interested person may submit
3191 written comments on the draft permit and may request a hearing. Requests for hearings shall be
3192 made in writing to the Administrator and shall state the reasons for the request.

3193
3194 (ii) The Administrator shall hold a hearing whenever the Administrator finds,
3195 on the basis of requests, a significant degree of public interest in a draft permit.

3196
3197 (iii) The Administrator may hold a hearing whenever a hearing may clarify
3198 issues involved in a permit decision.

3199
3200 (iv) The public comment period shall automatically extend to the close of any
3201 hearing. The Administrator may also extend the comment period by so stating at the hearing.

3202
3203 (f) The Administrator shall render a decision on the draft permit within sixty (60)
3204 days after completion of the public comment period if no hearing is held. If a hearing is held, the
3205 Administrator shall make a decision on any Department hearing as soon as practicable after
3206 receipt of the transcript or after the expiration of the time set to receive written comments.

3207
3208 (g) At the time a final decision is issued, the Department shall respond in writing to
3209 comments received during the public comment period or during the hearing held by the
3210 Department. This response shall:

3211
3212 (i) Specify any changes that have been made to the permit and the reasons for
3213 the changes; and

3214
3215 (ii) Briefly describe and respond to all comments stating a technical or
3216 regulatory concern that is within the authority of the Department to regulate.

3217
3218 **Section 28. Incorporation by Reference.**

3219
3220 (a) These rules incorporate by reference the following statutes, rules, and regulations

3221 in effect as of July 1, 2020:

3222

3223 (i) 10 C.F.R. Part 20, Appendix B, Table II, Column 2, available at
3224 <http://www.ecfr.gov>;

3225

3226 (ii) 40 C.F.R. §§ 98.440 to 98.449, available at <http://www.ecfr.gov>;

3227

3228 (iii) 40 C.F.R. 141, Subparts E, F, and G, available at: <http://www.ecfr.gov>;

3229

3230 (iv) 40 C.F.R. § 261.3 available at: <http://www.ecfr.gov>;

3231

3232 (v) American Petroleum Institute Recommended Practice, API RP 14C,
3233 *Recommended Practice for Analysis, Design, Installation and Testing of Safety Systems for*
3234 *Offshore Production Facilities, Recommended Practice 14C*, (2018), referred to as “API RP
3235 14C”, available at [https://www.apiwebstore.org/publications/item.cgi?af9eaacd-f8b0-4d7c-bfa7-](https://www.apiwebstore.org/publications/item.cgi?af9eaacd-f8b0-4d7c-bfa7-2c39a409f892)
3236 [2c39a409f892](https://www.apiwebstore.org/publications/item.cgi?af9eaacd-f8b0-4d7c-bfa7-2c39a409f892);

3237

3238 (vi) American Petroleum Institute Specification, API Spec 10A, *Specification*
3239 *for Cements and Materials for Well Cementing. 25th Edition*, (2019), referred to as “API
3240 Specification 10A”, available at [https://www.apiwebstore.org/publications/item.cgi?82493435-](https://www.apiwebstore.org/publications/item.cgi?82493435-f281-45d8-af82-07ad8131cb56)
3241 [f281-45d8-af82-07ad8131cb56](https://www.apiwebstore.org/publications/item.cgi?82493435-f281-45d8-af82-07ad8131cb56);

3242

3243 (vii) American Petroleum Institute Recommended Practice, API RP 10D-2,
3244 *Centralizer Placement and Stop-collar Testing*, (2020), referred to as “API RP 10D-2”, available
3245 at <https://www.apiwebstore.org/publications/item.cgi?7ad6705a-954e-476c-b520-47cbbdce9f06>;

3246

3247 (viii) American Petroleum Institute Recommended Practice, API RP 10B-2,
3248 *Recommended Practice for Testing Well Cements*, (2019), referred to as “API RP 10B-2”,
3249 available at [https://www.apiwebstore.org/publications/item.cgi?3c1808c7-6312-4b8d-b3de-](https://www.apiwebstore.org/publications/item.cgi?3c1808c7-6312-4b8d-b3de-291ef79704c5)
3250 [291ef79704c5](https://www.apiwebstore.org/publications/item.cgi?3c1808c7-6312-4b8d-b3de-291ef79704c5);

3251

3252 (ix) American Petroleum Institute Recommended Practice, API RP 14B,
3253 *Design, Installation, Repair, and Operation of Subsurface Safety Valve Systems*, (2012), referred
3254 to as “API RP 14 B”, available at [https://www.apiwebstore.org/publications/item.cgi?a1711f10-](https://www.apiwebstore.org/publications/item.cgi?a1711f10-0121-4c12-936c-471c97a19f93)
3255 [0121-4c12-936c-471c97a19f93](https://www.apiwebstore.org/publications/item.cgi?a1711f10-0121-4c12-936c-471c97a19f93);

3256

3257 (x) American Petroleum Institute Specification, API Spec 5CT, *Specification*
3258 *for Casing and Tubing*, (2019), referred to as “API Specification 5CT”, available at
3259 <https://www.apiwebstore.org/publications/item.cgi?5b345884-5a3a-4889-8066-60f93e467f29>;

3260

3261 (xi) American Petroleum Institute Recommended Practice, API RP 5C1,
3262 *Recommended Practices for Care and Use of Casing and Tubing*, (2020), referred to as “API RP
3263 5C1”, available at [https://www.apiwebstore.org/publications/item.cgi?010058af-29b1-412c-](https://www.apiwebstore.org/publications/item.cgi?010058af-29b1-412c-b892-ec3e5583c534)
3264 [b892-ec3e5583c534](https://www.apiwebstore.org/publications/item.cgi?010058af-29b1-412c-b892-ec3e5583c534); and

3265

3266 (xii) American Petroleum Institute Specification, API Spec 11D1, *Packers and*

3267 *Bridge Plugs*, (2015), referred to as “API Specification 11D1”, available at
3268 <https://www.apiwebstore.org/publications/item.cgi?4828a454-0fea-451b-a61b-18304836ea91>.

3269

3270 (b) For these rules incorporated by reference:

3271

3272 (i) The Environmental Quality Council has determined that incorporation of
3273 the full text in these rules would be cumbersome or inefficient given the length or nature of the
3274 rules;

3275

3276 (ii) This Chapter does not incorporate later amendments or editions of
3277 incorporated codes, standards, rules, and regulations; and

3278

3279 (iii) All incorporated codes, standards, rules, and regulations are available for
3280 public inspection at the Department’s Cheyenne office. Contact information for the Cheyenne
3281 office may be obtained at <http://deq.wyoming.gov> or from (307) 777-7937.

3282

Appendix A. Risk Activity Table

	Major Risk (Feature, Event, or Process)
1	Mineral Rights Infringement (Trespass)
1.1	Leakage migrates into mineral zone or hydraulic front impacts recoverable mineral zone; causes may include plume migration different than modeled.
1.2	Post injection discovery of recoverable minerals.
1.3	New technology (or economic conditions) enables recovery of previously un-economically recoverable minerals.
1.4	Act of God (e.g. seismic event).
1.5	Formation fluid impact due to CO ₂ injection.
1.6	Address also contributing causes 3.1, 3.2, 3.3, 3.5, 4.3, and 4.4
2	Water Quality Contamination
2.1	Leakage of CO ₂ outside permitted area.
2.2	Leakage of drilling fluid contaminates potable water aquifer.
2.3	Rock/acid water (i.e. geochemistry) interaction contaminates potable water by carryover of dissolved contaminants.
2.4	Act of God (e.g. seismic event).
2.5	Formation fluid impact due to CO ₂ injection.
2.6	See also contributing causes 3.1, 3.2, 3.3, 3.5, 4.3, and 4.4
3	Single Large Volume CO ₂ Release to the Surface – Asphyxiation/Health/Ecological
3.1	Overpressurization (i.e. induced).
3.2	Caprock/reservoir failure.
3.3	Well blowout (e.g. at surface or bore failure below ground), includes monitoring wells – Causes could include seal failure (e.g. well, drilling or injection equipment).
3.4	Major mechanical failure of distribution system or storage facilities above ground or below ground (i.e. near the surface).
3.5	Orphan well failure (e.g. well not identified prior to injection).
3.6	Sabotage/Terrorist attack (e.g. on surface infrastructure).
3.7	Act of God (e.g. major seismic event)
4	Low Level CO ₂ Release to Surface – Ecological damage due to low-level releases; potential asphyxiation of human or ecological receptors
4.1	Overpressurization (i.e. induced).
4.2	Caprock/reservoir failure (e.g. Plume migrates along fault line/fissure to surface).
4.3	Incomplete geological seal (e.g. inaccurate characterization of sub-surface geology).
4.4	Well seal failure (e.g. well, drilling or injection equipment) including monitor wells
4.5	Mechanical failure of distribution system or storage facilities above or below ground (e.g. near surface).
4.6	Orphan wells (e.g. well not identified prior to injection).
4.7	Induced seismicity leading to leakage.
4.8	Act of God (e.g. seismic event).

Risk Activity Table (continued)

	Major Risk (Feature, Event, or Process)
5	Storage Rights Infringement (CO ₂ or other entrained contaminant gases) – Form of Mineral Rights Infringement
5.1	Leakage migrates into adjacent pore space; causes may include plume migrates faster than modeled.
5.2	Post injection decision (e.g. due to new technology or changed economic conditions) to store gas in adjacent pore space.
5.3	Acts of God affecting storage capacity of pore space.
5.4	Formation fluid impact due to CO ₂ injection.
5.5	Will also require primary contributing causes 3.1, 3.2, 3.3, 3.5, 4.3, and 4.4
6	Modified Surface Topography (subsidence or uplift) Resulting in Property/Infrastructure Damage
6.1	Induced Seismicity – Pressure from geochemistry induced reactivation of historic fault or dissolution of material caused by subsidence.
6.2	Formation fluid impact due to CO ₂ injection.
7	Entrained Contaminant (Non-CO ₂) Releases
7.1	Change in CO ₂ composition/properties (e.g. concentration of contaminate in CO ₂ supply increases).
7.2	Microbial activity initiated by injection process or composition.
	Will also require primary contributing causes 3.1, 3.2, 3.3, 3.5, 4.3, and 4.4
8	Accidents/Unplanned Events (Typical Insurable Events)
8.1	Surface infrastructure damage
8.2	Saline water releases from surface storage impoundment.