

CHAPTER 24

**Class VI Injection Wells and Facilities
Underground Injection Control Program**

Section 1. Authority and Purpose. These regulations are promulgated pursuant to Wyoming Statutes (W.S.) § 35-11-101 through 2005, specifically § 313, and no person shall sequester carbon dioxide unless authorized by an Underground Injection Control (UIC) permit issued by the Department of Environmental Quality (DEQ). 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 shall not be subject to the provisions of this regulation 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.

These rules and regulations also provide financial assurance for the purposes specified in 35-11-313.

Section 2. Definitions. The following definitions supplement those definitions contained in Section § 35-11-103 of the Wyoming Environmental Quality Act.

(a) “Abandoned well” means a well whose use has been permanently discontinued or that is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.

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

(c) “Area of review” means the subsurface three-dimensional extent of the carbon dioxide plume, associated pressure front, and displaced fluids, as well as the overlying formations, and surface area above that delineated region. The area of review is based on available site characterization, monitoring, and operational data as set forth in Section 8 of this chapter.

(d) "Background" means the constituents or parameters and the concentrations or measurements that describe water quality and water quality variability prior to the subsurface discharge.

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

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

(g) “Carbon dioxide stream” means carbon dioxide, plus associated substances derived from the source materials and any processing, and any substances added to the stream to enable or improve the injection process. This chapter does not apply to any carbon dioxide stream that meets the definition of a hazardous waste under 40 CFR Part 261.

47

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

52

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

54

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

59

60 (k) “Class II Well” shall mean any non-commercial well used to dispose of water
61 and/or fluids directly associated with the production of oil and/or gas, any well used to inject
62 fluids or gas for enhanced oil recovery, or any well used for the storage of liquid hydrocarbons.
63 Non-hazardous gas plant wastes may be disposed of in a Class II well pending Environmental
64 Protection Agency co-approval, as defined in Wyoming Oil and Gas Conservation Commission
65 Rules and Regulations, Chapter 1, Section 2.

66

67 (l) “Class V facility” means any property that contains an injection well, drywell, or
68 subsurface fluid distribution system that is not defined as a Class I, II, III, IV, or VI well in this
69 chapter. The Class V facility includes all systems of collection, treatment, and control that are
70 associated with the subsurface disposal. Class V injection wells are described in Water Quality
71 Rules and Regulations Chapter 27.

72

73 (m) “Class VI well” means a well injecting a carbon dioxide stream for geologic
74 sequestration, beneath the lowermost formation containing a USDW; or a well used for geologic
75 sequestration of carbon dioxide that has been granted a waiver of the injection depth
76 requirements pursuant to requirements of Section 10 of this chapter; or, a well used for geologic
77 sequestration of carbon dioxide that has received an expansion to the areal extent of an existing
78 Class II enhanced oil recovery or enhanced gas recovery aquifer exemption pursuant to Section 5
79 of this chapter. Class VI wells are regulated under this chapter.

80

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

86

87 (o) “Contaminant” means any physical, chemical, biological, or radiological
88 substance or matter in water.

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90 (p) “Corrective action” means the use of Administrator-approved methods to ensure
91 that wells within the area of review do not serve as conduits for the movement of fluids into
92 geologic formations other than those to be authorized under the permit.

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(q) "Draft permit" means a document indicating the tentative decision by the Department to issue or deny, modify, revoke and reissue, or terminate a permit. A notice of intent to terminate a permit and a notice of intent to deny a permit are types of draft permits. A denial of a request for modification, revocation and reissuance, or termination is not a draft permit. A draft permit for issuance shall contain all conditions and content, compliance schedules and monitoring requirements required by this chapter.

(r) "Duly authorized representative" means a specific individual or a position having responsibility for the overall operation of the regulated facility or activity. The authorization shall be made in writing by a responsible corporate officer and shall be submitted to the Administrator.

(s) "Endangerment" means exposure to actions or activities that could pollute an Underground Source of Drinking Water (USDW).

(t) "Exempted aquifer" means an "aquifer" or a portion thereof that meets the criteria in the definition of "underground source of drinking water" but that has been exempted according to the procedures in Section 5(c) of this chapter.

(u) "Experimental technology" means a technology that has not been proven feasible under the conditions in which it is being tested.

(v) "Fact sheet" means a document briefly setting forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Fact sheets for Class VI wells are incorporated into the public notice.

(w) "Fault" means a surface or zone of rock fracture along which there has been displacement.

(x) "Flow rate" means the volume per time unit given to the flow of gases or other fluid substance that emerges from an orifice, pump, turbine or passes along a conduit or channel.

(y) "Fluid" means any material that flows or moves, whether semisolid, liquid, sludge, gas or any other form or state.

(z) "Formation" means a body of consolidated or unconsolidated rock characterized by a degree of lithologic homogeneity that is prevailing, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

(aa) "Formation fluid" means fluid present in a formation under natural conditions as opposed to introduced fluids, such as drilling mud.

(bb) "Geologic sequestration project" means an injection well or wells used to emplace a carbon dioxide stream into an injection zone for geologic sequestration. It includes the subsurface three-dimensional extent of the carbon dioxide plume, associated pressure front, and displaced

139 fluid, as well as the surface area above that delineated region. (Reference Section 35-11-103(c) of
140 the Wyoming Environmental Quality Act for definitions of *geologic sequestration*, *geologic*
141 *sequestration site*, and *geologic sequestration facilities*.)

142
143 (cc) “Groundwater” means subsurface water that fills available openings in rock or
144 soil materials such that they may be considered water saturated under hydrostatic pressure.

145
146 (dd) “Groundwaters of the State” are all bodies of underground water that are wholly
147 or partially within the boundaries of the State.

148
149 (ee) “Hazardous waste” means a hazardous waste as defined in 40 CFR § 261.3.

150
151 (ff) “Individual permit” means a permit issued for a specific facility operated by an
152 individual operator, company, municipality, or agency. An individual permit may be established
153 as an area permit and include multiple points of discharge that are all operated by the same
154 person.

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156 (gg) “Injectate” means the material injected through any underground injection facility
157 after it has received whatever pretreatment is done.

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

162
163 (ii) “Lithology” means the description of rocks on the basis of their physical and
164 chemical characteristics.

165
166 (jj) “Log” means to make a written record progressively describing the strata and
167 geologic and hydrologic character thereof to include electrical, radioactivity, radioactive tracer,
168 temperature, cement bond and similar surveys, a lithologic description of all cores, and test data.

169
170 (kk) “Long string casing” means a casing that is continuous from at least the top of the
171 injection interval to the surface and that is cemented in place.

172
173 (ll) “Long-term stewardship” means after release of financial assurance, upon site
174 closure, where the sequestration site may require periodic monitoring, measurement, or
175 verification of plume stabilization over an indefinite period of time.

176
177 (mm) “Mechanical integrity” means the sound and unimpaired condition of all
178 components of the well or facility or system for control of a subsurface discharge and associated
179 activities.

180
181 (nn) “Owner or operator” means the owner or operator of any facility or activity
182 subject to regulation under the Resource Conservation Recovery Act (RCRA) or an approved
183 state program; the Safe Drinking Water Act Underground Injection Control (UIC) program
184 administered by the US EPA or a state; the National Pollutant Discharge Elimination System

185 (NPDES) or an authorized state program; or the Clean Water Act Section 404 Dredge and Fill
186 permit program.

187
188 (oo) “Packer” means a device lowered into a well to produce a fluid-tight seal.

189
190 (pp) “Permit” means a Wyoming Underground Injection Control permit, unless
191 otherwise specified.

192
193 (qq) “Permittee” means the named permit holder.

194
195 (rr) “Plugging” means the act or process of stopping the flow of water, oil or gas into
196 or out of a formation through a borehole or well penetrating that formation.

197
198 (ss) “Plugging record” means a systematic listing of permanent or temporary
199 abandonment of water, oil, gas, test, exploration and waste injection wells, and may contain a
200 well log, description of amounts and types of plugging material used, the method employed for
201 plugging, a description of formations that are sealed and a graphic log of the well showing
202 formation location, formation thickness, and location of plugging structures.

203
204 (tt) “Plume stabilization” means the carbon dioxide that has been injected subsurface
205 essentially no longer expands vertically or horizontally and poses no threat to USDWs, human
206 health, safety, or the environment, as demonstrated by a minimum of three (3) consecutive years
207 of monitoring data.

208
209 (uu) “Point of compliance” means a point at which the permittee shall meet all permit
210 and regulatory requirements.

211
212 (vv) “Point of injection” means the last accessible sampling point prior to a fluid being
213 released into the subsurface environment through a Class VI injection well.

214
215 (ww) “Post-injection site care” means the monitoring, measurement, verification, and
216 other actions (including corrective action) needed to ensure that USDW’s are not endangered,
217 following the closure of injection wells until plume stabilization has been achieved and certified
218 by the Administrator, as required under Section 17 of this chapter.

219
220 (xx) “Pressure” means the total load or force per unit area acting on a surface.

221
222 (yy) “Pressure front” means the zone of elevated pressure that is created by the
223 injection of the carbon dioxide stream into the subsurface. The pressure front of a carbon dioxide
224 plume refers to a zone where there is a pressure differential sufficient to cause movement of
225 injected fluids or formation fluid if a migration pathway or conduit were to exist.

226
227 (zz) “Public hearing” means a non-adversary hearing held by the Administrator or
228 Director of the Department. The hearing is conducted pursuant to Chapter 9 of the Wyoming
229 Department of Environmental Quality Rules of Practice and Procedure.

230

231 (aaa) “Radioactive waste” means any waste that contains radioactive material in
232 concentrations that exceed those listed in 10 CFR Part 20, Appendix B, Table II, Column 2 as of
233 March 27, 2006.

234
235 (bbb) “Receiver” means any zone, interval, formation, or unit in the subsurface into
236 which a carbon dioxide stream is injected.

237
238 (ccc) “Responsible corporate officer” means a president, secretary, treasurer, or vice
239 president of the corporation in charge of a principal business function, or any other person who
240 performs similar policy- or decision-making functions for the corporation.

241
242 (ddd) “Secondarily affected aquifer” means any aquifer affected by migration of fluids
243 from an injection facility, when the aquifer is not directly discharged into.

244
245 (eee) “Site closure” means the point/time, as certified by the Administrator following
246 the requirements of Section 17 of this chapter, at which time the owner or operator of a geologic
247 sequestration project is released from post-injection site care responsibilities.

248
249 (fff) “Stratum” (plural strata) means a single sedimentary bed or layer, regardless of
250 thickness, that consists of generally the same kind of rock material.

251
252 (ggg) “Subsurface discharge” means a discharge into a receiver.

253
254 (hhh) “Surface casing” means the first string of well casing to be installed in the well.

255
256 (iii) “Transmissive fault or fracture” means a fault or fracture that has sufficient
257 permeability and vertical extent to allow fluids to move beyond the confining zone.

258
259 (jjj) “Underground injection” means a well injection.

260
261 (kkk) “USDW” or “Underground source of drinking water” means those aquifers or
262 portions thereof that meet the definition at 40 CFR 144.3 as of November 15, 1984.

263
264 (lll) “US EPA Administrator” means the Administrator of US EPA in Washington,
265 D.C.

266
267 (mmm) “Vadose Zone” means the unsaturated zone in the earth, between the land
268 surface and the top of the first saturated aquifer. The vadose zone contains water at less than
269 saturated conditions.

270
271 (nnn) “Water quality management area” means the area delineated for the protection of
272 water quality under a Department-approved plan developed under Sections 303, 208 and/or 201
273 of the Federal Clean Water Act, as amended.

274

275 (ooo) “Well” means an opening, excavation, shaft, or hole in the ground allowing or
276 used for an underground injection, or for monitoring, or an improved sinkhole; or a subsurface
277 fluid distribution system.

278
279 (ppp) “Well injection” means the subsurface emplacement of fluids through a well.
280

281 (qqq) “Well plug” means a watertight and gastight seal installed in a borehole or well to
282 prevent movement of fluids.

283
284 (rrr) “Well stimulation” means several processes used to clean the wellbore, enlarge
285 channels, and increase pore space in the interval to be injected and includes surging, jetting,
286 blasting, acidizing, hydraulic fracturing.

287
288 (sss) “Well monitoring” means the measurement by on-site instruments or laboratory
289 methods, of the quality of water in a well.

290
291 (ttt) “Workover” means to pull the tubing, packer, or any downhole hardware from the
292 well and inspect, replace, or refurbish it prior to placing that hardware back in service, or to enter
293 the hole with any drilling tool.

294
295 (uuu) “Wellhead protection area” means the area delineated for the protection of a
296 public water supply utilizing a groundwater source under a Department-approved plan developed
297 pursuant to Section 1528 of the federal Safe Drinking Water Act.

298
299 **Section 3. Applicability.**
300

301 (a) These regulations shall apply to all Class VI wells used to inject carbon dioxide
302 streams for the purpose of geologic sequestration.
303

304 (b) In addition, these regulations shall apply to owners and operators of Class I
305 industrial, Class II, or Class V experimental or demonstration carbon dioxide injection projects
306 who seek to apply for a Class VI geologic sequestration permit for their well or wells.
307

308 (i) Owners and/or operators of permitted Class I, Class II, or Class V
309 injection well(s) seeking to convert their well(s) to a Class VI well shall apply for a Class VI
310 permit and shall demonstrate to the Administrator that the well(s) was/were engineered and
311 constructed to meet the requirements outlined in Section 9(a) of these regulations and ensure
312 protection of USDWs, in lieu of requirements of Section 9(b) and Section 11(a) of this chapter.
313 By December 10, 2011, owners or operators of either Class I wells previously permitted for the
314 purpose of geologic sequestration or Class V experimental technology wells no longer being
315 used for experimental purposes that will continue injection of carbon dioxide for the purpose of
316 geologic sequestration must apply for a Class VI permit.
317

318 (ii) If the Administrator determines that USDWs will not be endangered, such
319 wells are exempt, at the Administrator’s discretion, from the requirements of Section 9(b)(i)
320 through (vii) and Section 11(a)(i) through (v) of this chapter.
321

322 (c) For owners and operators of Class II operations described in W.S. § 35-11-313(c):

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

326

327 (A) Increase in reservoir pressure within the injection zone(s).

328

329 (B) Increase in carbon dioxide injection rates.

330

331 (C) Decrease in reservoir production rates.

332

333 (D) Distance between the injection zone(s) and USDWs.

334

335 (E) Suitability of the Class II area of review delineation.

336

337 (F) Quality of abandoned well plugs within the area of review.

338

339 (G) The owner’s and/or operator’s plan for recovery of carbon dioxide
340 at the cessation of injection.

341

342 (H) The source and properties of the injected carbon dioxide.

343

344 (I) Any additional site-specific factors as determined by the

345 Administrator.

346

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

351

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

355

356 (d) These regulations do not apply to the injection of any carbon dioxide stream that
357 meets the definition of a hazardous waste.

358

359 (e) Compliance with a permit during its term constitutes compliance, for purposes of
360 enforcement, with Part C of the SDWA. However, a permit may be modified, revoked and
361 reissued, or terminated during its term for cause as set forth in Section 4 of this chapter.

362

363 (f) The requirements to maintain and implement approved plans, and maintain
364 adequate financial responsibility, are directly enforceable regardless of whether the requirements
365 are conditions of the permit.

366

367 **Section 4. Permits Required; Processing of Permits; Requirements Applicable to**

368 **All Permits.**

369

370 (a) Permits required.

371

372 (i) Owners or operators of Class VI wells must obtain a permit in accordance
373 with these regulations. Class VI wells are not authorized by rule to inject.

374

375 (ii) Construction, installation, operation, monitoring, testing, plugging, post-
376 injection site care, and modification to, or of, any Class VI well shall be allowed only in
377 accordance with these regulations.

378

379 (iii) Injections from Class VI wells shall be restricted to those receivers
380 defined as Class V (Hydrocarbon Commercial) or Class VI groundwaters by the Department
381 pursuant to Water Quality Rules and Regulations Chapter 8.

382

383 (iv) A separate permit to construct is not required under Water Quality Rules
384 and Regulations Chapter 3 for any Class VI facility.

385

386 (v) Permits for Class VI wells shall be issued for the operating life of the
387 facility and extend through the post-injection site care period until the geologic sequestration
388 project is closed in accordance with Department rules and regulations.

389

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

392

393 (vii) Each permit shall be reviewed by the Department at least once every five
394 (5) years to determine whether it should be modified, revoked and reissued, terminated or a
395 minor modification made pursuant to this chapter.

396

397 (viii) Sections of permit applications filed under this chapter that represent
398 engineering work shall be sealed, signed, and dated by a licensed professional engineer as
399 required by W.S. § 33-29-601.

400

401 (ix) Sections of permit applications filed under this chapter that represent
402 geologic work shall be sealed, signed, and dated by a licensed professional geologist as required
403 by W.S. § 33-41-115.

404

405 (b) Permit processing procedures applicable to all Class VI facilities, individual, and
406 general permits:

407

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

410

411 (ii) Within sixty (60) days of submission of the application, the Administrator
412 shall make an initial determination of completeness. An application shall be determined
413 complete when the Administrator receives an application and any supplemental information

414 necessary to determine compliance with these regulations. The completeness of any application
415 for a permit shall be judged independently of the status of any other permit application or permit
416 for the same facility or activity.

417
418 (iii) Re-submittal of information by an applicant for an incomplete application
419 will begin the process described in this section.

420
421 (iv) At the end of any 60-day review period where an application is determined
422 complete, the Administrator shall prepare a draft permit for issuance or denial, prepare a fact
423 sheet on the proposed operation, and provide public notice pursuant to Section 20 of this chapter.

424
425 (A) If the Administrator tentatively decides to deny the permit
426 application, he or she shall issue a notice of intent to deny. A notice of intent to deny the permit
427 application is a type of draft permit that follows the same procedures as any draft permit
428 prepared under this section.

429
430 (B) If the Administrator's final decision is that the tentative decision to
431 deny the permit application was incorrect, he or she shall withdraw the notice of intent to deny
432 and proceed to prepare a draft permit under Section 20(b) of this chapter.

433
434 (v) The Administrator may deny an individual permit for any of the following
435 reasons:

436
437 (A) The application is incomplete;

438
439 (B) The project, if constructed and/or operated, will violate applicable
440 state surface or groundwater standards;

441
442 (C) The application proposes the construction or operation of a project
443 that does not meet the requirements of this chapter;

444
445 (D) The permitted facility would be in conflict with or is in conflict
446 with a State-approved local wellhead protection plan, State-approved local source water
447 protection plan, or State-approved water quality management plan; or

448
449 (E) Other justifiable reasons necessary to carry out the provisions of
450 the Wyoming Environmental Quality Act.

451
452 (vi) Permits may be modified, revoked and reissued, or terminated either in
453 response to a petition from any interested person (including the permittee) or upon the
454 Administrator 's initiative. However, permits may only be modified, revoked and reissued, or
455 terminated for the reasons specified in Section 4(b) of this chapter. All requests shall be in
456 writing and shall contain facts or reasons supporting the request.

457
458

459 (A) If the Administrator decides the petition is not justified, the
460 petitioner shall be sent a brief written response giving the reason for the decision. A request for
461 modification, revocation and reissuance, or termination shall be considered denied if the
462 Administrator takes no action within sixty (60) days after receiving the written request. Denials
463 of requests for modification, revocation and reissuance, or termination are not subject to public
464 notice and comment. Denials by the Administrator may be appealed for hearing to the
465 Environmental Quality Council by a letter briefly setting forth the relevant facts.

466
467 (vii) The Administrator may modify a permit when:

468
469 (A) Any material or substantial alterations or additions to the facility
470 occur after permitting or licensing that justify the application of permit conditions that are
471 different or absent in the existing permit;

472
473 (B) Any modification in the operation of the facility is capable of
474 causing or increasing pollution in excess of applicable standards or permit conditions;

475
476 (C) Information warranting modification is discovered after the
477 operation has begun that would have justified the application of different permit conditions at the
478 time of permit issuance;

479
480 (D) Regulations or standards upon which the permit was based have
481 changed by promulgation of amended standards or regulations or by judicial decision after the
482 permit was issued;

483
484 (E) Cause exists for termination, as described in this section, but the
485 Department determines that modification is appropriate; or

486
487 (F) Modification is necessary to comply with applicable statutes,
488 standards, or regulations.

489
490 (viii) The Administrator may modify a permit whenever the Administrator
491 determines that permit changes are necessary based on:

492
493 (A) Area of review reevaluations under Section 8(d)(i) of this chapter;

494
495 (B) Any amendments to the testing and monitoring plan under Section
496 14(b)(xii) of this chapter;

497
498 (C) Any amendments to the injection well-plugging plan under Section
499 16(c) of this chapter;

500
501 (D) Any amendments to the post-injection site care and site closure
502 plan under Section 17(a)(iv) of this chapter;

503

504 (E) Any amendments to the emergency and remedial response plan
505 under Section 18(a)(i) of this chapter;

506
507 (F) A review of monitoring and/or testing results conducted in
508 accordance with permit requirements; or

509
510 (G) A determination that the injectate is a hazardous waste as defined
511 in 40 CFR § 261.3 either because the definition has been revised, or because a previous
512 determination has been changed.

513
514 (ix) Suitability of the facility location will not be considered at the time of
515 permit modification or revocation and reissuance unless new information or standards indicate
516 that a threat to human health or the environment exists that was unknown at the time of permit
517 issuance.

518
519 (x) Minor modifications of permits may occur with the consent of the
520 permittee without following the public notice requirements. Minor modifications will become
521 final twenty (20) days from the date of receipt of such notice. For the purposes of this chapter,
522 minor modifications may only:

523
524 (A) Correct typographical errors;

525
526 (B) Require more frequent monitoring or reporting by the permittee;

527
528 (C) Change an interim compliance date in a schedule of compliance,
529 provided the new date is not more than 120 days after the date specified in the existing permit
530 and does not interfere with attainment of the final compliance date requirement;

531
532 (D) Allow for a change in ownership or operational control of a facility
533 where the Administrator determines that no other change in the permit is necessary, provided
534 that a written agreement containing a specific date for transfer of permit responsibility, coverage,
535 and liability between the current and new permittees have been submitted to the Administrator;

536
537 (E) Change quantities or types of fluids injected that are within the
538 capacity of the facility as permitted and, in the judgment of the Administrator, would not
539 interfere with the operation of the facility or its ability to meet conditions described in the permit
540 and would not change its classification;

541
542 (F) Change construction requirements approved by the Administrator
543 pursuant to subparagraphs (c)(i)(BB)(I) through (III) of this section provided that any such
544 alteration shall comply with the requirements of this chapter;

545
546 (G) Amend a plugging and abandonment plan that has been updated
547 under Section 16 of this chapter; or

548

549 (H) Amend a Class VI injection well testing and monitoring plan,
550 plugging plan, post-injection site care and site closure plan, or emergency and remedial response
551 plan where the modifications merely clarify or correct the plan, as determined by the
552 Administrator.

553
554 (xi) The Administrator may revoke and reissue or terminate a permit for any of
555 the following reasons:

556
557 (A) Noncompliance with terms and conditions of the permit;

558
559 (B) Failure in the application or during the issuance process to disclose
560 fully all relevant facts, or misrepresentation of any relevant facts at any time; or

561
562 (C) A determination that the activity endangers human health or the
563 environment and can only be regulated to acceptable levels by a permit modification or
564 termination.

565
566 (xii) The Administrator may modify a permit to resolve issues that could lead
567 to the revocation of the permit under Section 4(b) of this chapter. The Administrator, as part of
568 any notification of intent to terminate a permit, shall order the permittee to proceed with
569 reclamation on a reasonable time period.

570
571 (xiii) If the Administrator tentatively decides to modify or revoke and reissue a
572 permit, a draft permit incorporating the proposed changes shall be prepared. The Administrator
573 may request additional information and, in the case of a modified permit, may require the
574 submission of an updated application. In the case of revoked and reissued permits, the
575 Administrator shall require the submission of a new application.

576
577 (xiv) In a permit modification under Section 4(b) of this chapter, only those
578 conditions to be modified shall be reopened when a new draft permit is prepared. All other
579 aspects of the existing permit shall remain in effect for the duration of the unmodified permit and
580 the modified permit shall expire on the date when the original permit would have expired. When
581 a permit is revoked and reissued under this section, the entire permit is reopened as if the permit
582 has expired and is being reissued. During any revocation and reissuance proceeding, the
583 permittee shall comply with all conditions of the existing permit until a new final permit is
584 issued.

585
586 (xv) Permit modifications, revocations, or terminations shall be developed as a
587 draft permit and are subject to the public notice and hearing requirements outlined in Section 20
588 of this chapter.

589
590 (xvi) Transfer of a permit is allowed only upon approval by the Administrator.
591 When a permit transfer occurs pursuant to this section, the permit rights of the previous permittee
592 will automatically terminate.

593

594 (A) The proposed permit holder shall apply in writing as though that
595 person was the original applicant for the permit and shall further agree to be bound by all of the
596 terms and conditions of the permit.

597
598 (B) Transfer will not be allowed if the permittee is in noncompliance
599 with any term and conditions of the permit, unless the transferee agrees to bring the facility back
600 into compliance with the permit.

601
602 (C) When a permit transfer occurs, the Administrator may modify a
603 permit pursuant to this section. The Administrator shall provide public notice pursuant to Section
604 20 of this chapter for any modification other than a minor modification defined by this section.

605
606 (D) A permit may be transferred by the permittee to a new owner or
607 operator only if the permit has been modified or revoked and reissued (under paragraph (xiii) of
608 this subsection), or a minor modification made (under paragraph (xii) of this subsection), to
609 identify the new permittee and incorporate such other requirements as may be necessary under
610 the Safe Drinking Water Act.

611
612 (c) Permit conditions.

613
614 (i) Permit conditions shall be incorporated either expressly or by reference. If
615 incorporated by reference, a specific citation to the incorporated conditions must be given in the
616 permit. All individual permits issued under this chapter shall contain the following conditions:

617
618 (A) A requirement that the permittee comply with all conditions of the
619 permit, and any permit noncompliance constitutes a violation of these regulations and is grounds
620 for enforcement action, permit termination, revocation and reissuance, or modification, or for
621 denial of a permit renewal application;

622
623 (B) A requirement that if the permittee wishes to continue injection
624 activity after the expiration date of the permit, the permittee must apply to the Administrator for,
625 and obtain, a new permit prior to expiration of the existing permit;

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

630
631 (D) A requirement that the permittee shall take all reasonable steps to
632 minimize or correct any adverse impact on the environment resulting from noncompliance with
633 this permit;

634
635 (E) A requirement that the permittee properly operate and maintain all
636 facilities and systems of treatment and control, and related appurtenances, that are installed or
637 used by the permittee to achieve compliance with the conditions of this permit. Proper operation
638 and maintenance includes effective performance, adequate funding and operator staffing and
639 training, and adequate laboratory and process controls including appropriate quality assurance

640 procedures. This provision requires the operation of back-up or auxiliary facilities or similar
641 systems only when necessary to achieve compliance with the conditions of the permit;

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

647
648 (G) A stipulation that this permit does not convey any property rights
649 of any sort, or any exclusive privilege;

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

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

661
662 (1.) Inspect the discharge and related facilities, practices, or
663 operations regulated or required under this permit;

664
665 (2.) Review and copy reports and records required by the
666 permit;

667
668 (3.) Collect fluid samples for analysis for the purposes of
669 assuring permit compliance or as otherwise authorized by the SDWA, any substances or
670 parameters at any location;

671
672 (4.) Measure and record water levels; and

673
674 (5.) Perform any other function authorized by law or regulation.

675
676 (J) A requirement that the permittee furnish any information necessary
677 to establish a monitoring program pursuant to Section 14 of this chapter. Conditions shall
678 specify;

679
680 (1.) Required monitoring including type, intervals, and
681 frequency sufficient to yield data that are representative of the monitored activity including when
682 appropriate, continuous monitoring;

683

684 (2.) Requirements concerning the proper use, maintenance, and
685 installation, when appropriate, of monitoring equipment or methods, including biological
686 monitoring methods when appropriate; and
687

688 (3.) Applicable reporting requirements based upon the impact
689 of the regulated activity and as specified in Section 15 of this chapter. Reporting shall be no less
690 frequent than specified in the above regulations.
691

692 (K) A requirement that all samples and measurements taken for the
693 purpose of monitoring shall be representative of the monitored activity and records of all
694 monitoring information be retained by the permittee. The monitoring information to be retained
695 shall be that information stipulated in the monitoring program established pursuant to the criteria
696 in Section 14 of this chapter;
697

698 (L) A requirement that all applications, reports, and other information
699 submitted to the Administrator contain certifications as required in Section 5(i) of this chapter,
700 and be signed by a person who meets the requirements to sign permit applications found in
701 Section 5(h), or for routine reports, a duly authorized representative;
702

703 (M) A requirement that the permittee give advance notice to the
704 Administrator as soon as possible of any planned physical alteration or additions, other than
705 authorized operation and maintenance, to the permitted facility and receive authorization prior to
706 implementing the proposed alteration or addition;
707

708 (N) A requirement that any modification that may result in a violation
709 of a permit condition shall be reported to the Administrator, and any modification that will result
710 in a violation of a permit condition shall be reported to the Administrator through the submission
711 of a new or amended permit application;
712

713 (O) A requirement that any transfer of a permit must first be approved
714 by the Administrator, and that no transfer will be approved if the facility is not in compliance
715 with the existing permit unless the proposed permittee agrees to bring the facility into
716 compliance;
717

718 (P) A requirement that monitoring results shall be reported at the
719 intervals specified elsewhere in the permit;
720

721 (Q) A requirement that reports of compliance or non-compliance, or
722 any progress reports on interim and final requirements contained in any compliance schedule, if
723 one is required by the Administrator, shall be submitted no later than thirty (30) days following
724 each schedule date;
725

726 (R) A requirement that the permittee shall report:
727

728 (I) Any monitoring or other information that indicates that any
729 contaminant may cause an endangerment to a USDW or indicates that the injected carbon

730 dioxide stream, displaced formation fluids, or associated pressure front may endanger a USDW
731 or threaten human health, safety, or the environment. In addition, the owner or operator shall:

- 732
- 733 (1.) Immediately cease injection;
 - 734
 - 735 (2.) Take all steps reasonably necessary to identify and
736 characterize any release; and
 - 737
 - 738 (3.) Notify the Administrator within twenty-four (24)
739 hours.

740

741 (II) Any noncompliance with a permit condition or malfunction
742 of the injection system that may cause fluid migration into or between USDWs or if an
743 excursion is discovered. It shall be orally reported to the Administrator within twenty-four (24)
744 hours from the time the permittee becomes aware of the circumstances, and a written submission
745 shall be provided within five (5) days of the time the permittee becomes aware of any excursion
746 or indication that a contaminant may cause an endangerment to a USDW. The written
747 submission shall contain:

- 748
- 749 (1.) A description of the noncompliance and its cause;
 - 750
 - 751 (2.) The period of noncompliance, including exact dates
752 and times, and, if the noncompliance has not been controlled, the anticipated time it is expected
753 to continue; and
 - 754
 - 755 (3.) Steps taken or planned to reduce, eliminate, and
756 prevent reoccurrence of the noncompliance.

757 .

758 (III) In addition, if an excursion is discovered the owner or
759 operator shall provide written notice to all surface owners, mineral claimants, mineral owners,
760 lessees and other owners of record of subsurface interests within thirty (30) days of discovery.

761

762 (S) A requirement that the permittee report all instances of
763 noncompliance not already required to be reported under paragraphs (c)(i)(Q) through (R) of this
764 section, at the time monitoring reports are submitted. The reports shall contain the information
765 listed in paragraph (c)(i)(R) of this section;

766

767 (T) A requirement that if the permittee becomes aware that it failed to
768 submit any relevant facts in a permit application, or submitted incorrect information in a permit
769 application or in any report to the Administrator, the permittee shall promptly submit such facts
770 or information;

771

772 (U) A requirement that the injection facility meet construction
773 requirements outlined in Section 9 of this chapter, and that the permittee submit a notice of
774 completion of construction to the Administrator; and allow for inspection of the facility upon
775 completion of construction, prior to commencing any injection activity;

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(V) A requirement that the permittee notify the Administrator at such times as the permit requires before conversion or abandonment of the facility;

(W) A requirement that injection may not commence until construction is complete. Construction is complete when:

(I) The permittee has submitted a notice of completion of construction to the Administrator; and

(II) The Administrator has inspected or otherwise reviewed the injection well and finds it is in compliance with the conditions of the permit, or the permittee has not received notice from the Administrator of their intent to inspect or otherwise review the injection well within thirteen (13) days of the date of the notice in subparagraph (U) of this paragraph, in which case prior inspection or review is waived and the permittee may commence injection. The Administrator shall include in his notice a reasonable time period in which they shall inspect the well.

(X) A requirement that the owner or operator of a Class VI well permitted under this part shall establish mechanical integrity prior to commencing injection or on a schedule determined by the Administrator. Thereafter, the owner or operator of Class VI wells must maintain mechanical integrity as defined in Section 13 of this chapter;

(Y) A requirement that when the Administrator determines that a Class VI well lacks mechanical integrity pursuant to Section 13 of this chapter, he/she shall give written notice of his/her determination to the owner or operator.

(I) Unless the Administrator requires immediate cessation, the owner or operator shall cease injection into the well within forty-eight (48) hours of receipt of the Administrator's determination.

(II) The Administrator may allow plugging of the well pursuant to the requirements of Section 16 of this chapter or require the permittee to perform such additional construction, operation, monitoring, reporting, and corrective action as is necessary to prevent the movement of fluid into or between USDWs caused by the lack of mechanical integrity. The owner or operator may resume injection upon written notification from the Administrator that the owner or operator has demonstrated mechanical integrity pursuant to Section 13 of this chapter.

(Z) A requirement that, for any Class VI well that lacks mechanical integrity, injection operations are prohibited until the permittee shows to the satisfaction of the Administrator under Section 13 of this chapter that the well has mechanical integrity.

(AA) A Class VI permit shall include conditions that meet the requirements set forth in Section 16 of this chapter. Where the plan meets the requirements of

822 Section 16 of this chapter, the Administrator shall incorporate it into the permit as a permit
823 condition. Temporary or intermittent cessation of injection operations is not abandonment.

824
825 (BB) Class VI injection well permits shall include conditions meeting
826 the requirements of Section 9 of this chapter. Permits shall contain the following requirements
827 when applicable:

828
829 (I) All wells shall achieve compliance with such requirements
830 according to a compliance schedule established as a permit condition. The owner or operator of a
831 proposed new injection well shall submit plans for testing, drilling, and construction as part of
832 the permit application.

833
834 (II) No construction may commence until a permit has been
835 issued containing construction requirements.

836
837 (III) All wells shall be in compliance with these requirements
838 prior to commencing injection operations. Changes in construction plans during construction
839 may be approved by the Administrator as minor modifications. No such changes may be
840 physically incorporated into construction of the well prior to approval of the modification by the
841 Administrator.

842
843 (IV) Corrective action as set forth in Section 8 of this chapter.

844
845 (V) Operation requirements as set forth in Section 9 of this
846 chapter; the permit shall establish any maximum injection volumes and/or pressures necessary to
847 ensure that fractures are not initiated in the confining zone, that injected fluids do not migrate
848 into any underground source of drinking water, that formation fluids are not displaced into any
849 underground source of drinking water, and to ensure compliance with the operating
850 requirements.

851
852 (VI) Monitoring and reporting requirements as set forth in
853 Sections 14 and 15 of this chapter. The permittee shall be required to identify types of tests and
854 methods used to generate the monitoring data.

855
856 (VII) The owner or operator of a Class VI well must comply with
857 the financial responsibility requirements set forth in Section 19 of this chapter.

858
859 (CC) The permit may, when appropriate, specify a schedule of
860 compliance leading to compliance with the SDWA and 40 CFR Parts 144, 145, 146, and 124.

861
862 (I) Any schedules of compliance shall require compliance as
863 soon as possible, and in no case later than three (3) years after the effective date of the permit.

864
865 (II) If a permit establishes a schedule of compliance that
866 exceeds one (1) year from the date of permit issuance, the schedule shall set forth interim
867 requirements and the dates for their achievement.

868
869 (1.) The time between interim dates shall not exceed one
870 (1) year unless,

871
872 (2.) The time necessary for completion of any interim
873 requirement is more than one (1) year and is not readily divisible into stages for completion, the
874 permit shall specify interim dates for the submission of reports of progress toward completion of
875 the interim requirements and indicate a projected completion date.

876
877 (III) The permit shall be written to require that if paragraph
878 (c)(i)(CC)(I) of this section is applicable, progress reports be submitted no later than thirty (30)
879 days following each interim date and the final date of compliance.

880
881 (ii) In addition to the conditions required of all permits, the Administrator
882 shall establish, on a case-by-case basis, conditions as required for monitoring, schedules of
883 compliance, and such additional conditions as are necessary to prevent the migration of fluids
884 into underground sources of drinking water. In the case of wells authorized by permit, these
885 additional requirements shall be imposed by modifying the permit in accordance with this
886 section, or the permit may be terminated under this section if cause exists, or appropriate
887 enforcement action may be taken if the permit has been violated.

888
889
890 (iii) In addition to conditions required in all permits the Administrator shall
891 establish conditions in permits as required on a case-by-case basis, to provide for and ensure
892 compliance with all applicable requirements of the SDWA and 40 CFR Parts 144, 145, 146, and
893 124.

894
895 (iv) New permits, and to the extent allowed under Section 4 modified or
896 revoked and reissued permits, shall incorporate each of the applicable requirements referenced in
897 this section. An applicable requirement is a State statutory or regulatory requirement that takes
898 effect prior to final administrative disposition of the permit. An applicable requirement is also
899 any requirement that takes effect prior to the modification or revocation and reissuance of a
900 permit, to the extent allowed in Section 4.

901
902 (d) The issuance of a permit does not authorize any injury to persons or property or
903 invasion of other private rights, or any infringement of State or local law or regulations.

904
905 **Section 5. Permit Application.**

906
907 (a) It is the operator's responsibility to make application for and obtain a permit in
908 accordance with these regulations. Each application must be submitted with all supporting data.

909
910 (b) A complete application for a Class VI well shall include:

911
912 (i) A brief description of the nature of the business and the activities to be
913 conducted that require the applicant to obtain a permit under this chapter.

914

915 (ii) The name, address and telephone number of the operator, and the
916 operator's ownership status and status as a Federal, State, private, public, or other entity.

917
918 (iii) Up to four SIC (Standard Industrial Classification) codes that best reflect
919 the principal products or services provided by the facility.

920
921 (iv) The name, address, and telephone number of the facility. Additionally, the
922 location of the geologic sequestration project shall be identified by section, township, range and
923 county, noting which, if any, sections include Indian lands.

924
925 (v) Within the area of review, a listing and status of all permits or construction
926 approvals associated with the geologic sequestration project received or applied for by the
927 applicant under any of the following programs:

928
929 (A) Hazardous Waste Management under the Resource Conservation
930 and Recovery Act (RCRA).

931
932 (B) UIC Program under the Safe Drinking Water Act.

933
934 (C) National Pollutant Discharge Elimination System (NPDES) under
935 the Clean Water Act.

936
937 (D) Prevention of Significant Deterioration (PSD) program under the
938 Clean Air Act.

939
940 (E) Nonattainment program under the Clean Air Act.

941
942 (F) National Emissions Standards for Hazardous Air Pollutants
943 (NESHAPs) pre-construction approval under the Clean Air Act.

944
945 (G) Dredge and fill permitting program under section 404 of
946 the Clean Water Act.

947
948 (vi) Within the area of review, a list of other relevant permits, whether federal
949 or state, associated with the geologic sequestration project that the applicant has been required to
950 obtain, such as construction permits. This includes a statement as to whether or not the facility is
951 within a state approved water quality management plan area, a state approved wellhead
952 protection area or a state approved source water protection area.

953
954 (vii) A map showing the injection well(s) for which a permit is sought and the
955 applicable area of review, consistent with Section 8 of this chapter.

956
957 (A) Within the area of review, the map must show the number, or name
958 and location of all known injection wells, producing wells, abandoned wells, plugged wells or
959 dry holes, deep stratigraphic boreholes, state or EPA-approved subsurface cleanup sites, public
960 drinking water supply wellhead or source water protection areas, surface bodies of water,

961 springs, mines (surface and subsurface), quarries, water wells and other pertinent surface features
962 including structures intended for human occupancy, state, tribal, and territory boundaries, and
963 roads.

964
965 (B) Only information of public record is required to be included on this
966 map.

967
968 (C) The map should also show faults, if known or suspected.
969

970 (viii) A map delineating the area of review based upon modeling, using all
971 available data including data available from any logging and testing of wells within and adjacent
972 (within one (1) mile) to the area of review;

973
974 (A) A Class VI area of review shall never be less than the area of
975 potentially affected groundwater.

976
977 (B) All areas of review shall be legally described by township, range,
978 and section to the nearest ten (10) acres as described under the general land survey system.
979

980 (ix) A description of the general geology of the area to be affected by the
981 injection of carbon dioxide including geochemistry, structure and faulting, fracturing and seals,
982 and stratigraphy and lithology including petrophysical attributes. The description shall also
983 include sufficient information on the geologic structure and reservoir properties of the proposed
984 storage site and overlying formations, including:

985
986 (A) Isopach maps of the proposed injection and confining zone(s), a
987 structural contour map aligned with the top of the proposed injection zone, and at least two (2)
988 geologic cross-sections of the area of review reasonably perpendicular to each other and showing
989 the geologic formations from the surface to total depth;

990
991 (B) Location, orientation, and properties of known or suspected faults
992 and fractures that may transect the confining zone(s) in the area of review and a determination
993 that they would not interfere with containment;

994
995 (C) Information on seismic history that have affected the proposed area
996 of review including knowledge of previous seismic events and history of these events, the presence
997 and depth of seismic sources, and a determination that the seismicity would not compromise
998 containment;

999
1000 (D) Data sufficient to demonstrate the effectiveness of the injection and
1001 confining zone(s), including data on the depth, areal extent, thickness, mineralogy, porosity,
1002 vertical permeability, and capillary pressure of the injection and confining zone(s) within the area
1003 of review, and geologic changes based on field data that may include geologic cores, outcrop data,
1004 seismic surveys, well logs, and names and lithologic descriptions;

1005

1006 (E) Geomechanical information on fractures, stress, ductility, rock
1007 strength, and in situ fluid pressures within the confining zone; and
1008

1009 (F) Geologic and topographic maps and cross-sections illustrating
1010 regional geology, hydrogeology, and the geologic structure of the local area.
1011

1012 (x) A compilation of all wells and other drill holes within, and adjacent
1013 (within one (1) mile) to the area of review. Such data must include a description of each well and
1014 drill hole type, construction, date drilled, location, depth, record of plugging and/or completion,
1015 and any additional information the Administrator may require.
1016

1017 (A) Applicants shall also identify the location of all known wells
1018 within, and adjacent (within one (1) mile) to the area of review that penetrate the confining or
1019 injection zone.
1020

1021 (B) Applicants shall perform mapping with sufficient resolution as to
1022 make a comprehensive effort to identify wells that are not in the public record using aerial
1023 photography, aerial survey, physical traverse, or other methods acceptable to the Administrator.
1024

1025 (C) Applicants shall perform corrective action as specified in Section 8
1026 of this chapter.
1027

1028 (xi) Maps and stratigraphic cross-sections indicating the general vertical and
1029 lateral limits of all USDWs, the location of water wells and springs within the area of review,
1030 their positions relative to the injection zone(s), and the direction of water movement, where
1031 known;
1032

1033 (xii) A characterization of the injection zone and aquifers above and below the
1034 injection zone that may be affected, including applicable pressure and fluid chemistry data to
1035 describe the projected effects of injection activities, and background water quality data that will
1036 facilitate the classification of any groundwaters that may be affected by the proposed discharge.
1037 This must include information necessary for the Division to classify the receiver and any
1038 secondarily affected aquifers under Water Quality Rules and Regulations Chapter 8;
1039

1040 (xiii) Baseline geochemical data on subsurface formations, including all
1041 USDWs in the area of review;
1042

1043 (xiv) Proposed operating data:
1044

1045 (A) Average and maximum daily rate and volume and/or mass and
1046 total anticipated volume and/or mass of the carbon dioxide stream;
1047

1048 (B) Average and maximum surface injection pressure;
1049

1050 (C) The source of the carbon dioxide stream; and
1051

1052 (D) An analysis of the chemical and physical characteristics of the
1053 carbon dioxide stream and any other substance(s) proposed for inclusion in the injectate stream;
1054 and

1055
1056 (E) Anticipated duration of the proposed injection period(s).

1057
1058 (xv) The compatibility of the carbon dioxide stream with fluids in the injection
1059 zone and minerals in both the injection and the confining zone(s), based on the results of the
1060 formation testing program, and with the materials used to construct the well;

1061
1062 (xvi) An assessment of the impact to fluid resources, on subsurface structures
1063 and the surface of lands that may reasonably be expected to be impacted, and the measures
1064 required to mitigate such impacts;

1065
1066 (xvii) Proposed formation testing program to obtain an analysis of the chemical
1067 and physical characteristics of the injection zone and confining zone and that meets the
1068 requirements of Section 11 of this chapter;

1069
1070 (xviii) Proposed stimulation program, a description of stimulation fluids to be
1071 used, and a determination that stimulation will not compromise containment. All stimulation
1072 programs must be approved by the Administrator as part of the permit application and
1073 incorporated into the permit;

1074
1075 (xix) Proposed procedure that outlines steps to conduct injection operation;

1076
1077 (xx) A wellbore schematic of the subsurface construction details and surface
1078 wellhead construction of the injection and monitoring wells;

1079
1080 (xxi) Injection well design and construction procedures that meet the
1081 requirements of Section 9 of this chapter;

1082
1083 (xxii) Proposed area of review and corrective action plan that meets the
1084 requirements under Section 8 of this chapter;

1085
1086 (xxiii) The status of corrective action on wells in the area of review;

1087
1088 (xxiv) All available logging and testing program data on the well(s) required by
1089 Section 11 of this chapter;

1090
1091 (xxv) A demonstration of mechanical integrity pursuant to Section 13 of this
1092 chapter;

1093
1094 (xxvi) A demonstration, satisfactory to the Administrator, that the applicant has
1095 met the financial responsibility requirements under Section 19 of this chapter;

1096

- 1097 (xxvii) Proposed testing and monitoring plan required by Section 14 of this
 1098 chapter;
 1099
- 1100 (xxviii) Proposed injection and monitoring well(s) plugging plan required by
 1101 Section 16(b) of this chapter; where the plan meets the requirements of Section 16(b) of this
 1102 chapter, the Administrator shall incorporate it into the permit as a permit condition.
 1103
- 1104 (xxix) Proposed post-injection site care plan required by Section 17(a) of this
 1105 chapter;
 1106
- 1107 (xxx) Proposed emergency and remedial response plan required by Section 18 of
 1108 this chapter;
 1109
- 1110 (xxxii) A site and facilities description, including a description of the proposed
 1111 geologic sequestration facilities;
 1112
- 1113 (xxxiii) Documentation sufficient to demonstrate that the applicant has all legal
 1114 rights, including but not limited to the right to surface use, necessary to sequester carbon dioxide
 1115 and associated constituents;
 1116
- 1117 (xxxiii) Proof of notice to surface owners, mineral claimants, mineral
 1118 owners, lessees, and other owners of record of subsurface interests as to the contents of such
 1119 notice. Notice requirements shall at a minimum require:
 1120
- 1121 (A) The publishing of notice of the application in a newspaper
 1122 of general circulation in each county of the proposed operation at weekly intervals for four (4)
 1123 consecutive weeks; and
 1124
- 1125 (B) A copy of the notice shall also be mailed to all surface
 1126 owners, mineral claimants, mineral owners, lessees and other owners of record of subsurface
 1127 interests that are located within one (1) mile of the proposed boundary of the geologic
 1128 sequestration site as defined by W.S. § 35-11-103(c)(xxi).
 1129
- 1130 (xxxiv) A list of contacts, submitted to the Administrator, for those Tribes
 1131 identified to be within the area of review of the geologic sequestration project based on
 1132 information provided in subparagraphs (b)(vii), (b)(vii)(A), (b)(vii)(B) of this section; and
 1133
- 1134 (xxxv) Any other information requested by the Administrator.
 1135
- 1136 (c) Expansion to the Areal Extent of Existing Class II Aquifer Exemptions for Class
 1137 VI Wells.
 1138
- 1139 (i) The Administrator may consider a request from owners and/or operators
 1140 of permitted Class II injection well(s) that are seeking to convert their well(s) to a Class VI well
 1141 and are seeking an expansion to the areal extent of an existing Class II enhanced oil recovery or
 1142 enhanced gas recovery aquifer exemption for the exclusive purpose of Class VI injection for

1143 geologic sequestration if the existing aquifer exemption and the affected wells meet the
1144 following conditions:

- 1145
- 1146 (A) It does not currently serve as a source of drinking water; and
- 1147
- 1148 (B) The total dissolved solids content of the groundwater is more than
1149 3,000 mg/L and less than 10,000 mg/L; and
- 1150
- 1151 (C) It is not reasonably expected to supply a public water system.
- 1152

1153 (ii) Such requests will not be final until the Administrator submits the request
1154 as a revision to the applicable Federal UIC program under 40 CFR Part 147 or as a substantial
1155 program revision to an approved State UIC program under 40 CFR § 145.32 and EPA approves
1156 the request.

1157

1158 (A) The owner or operator of a Class II enhanced oil recovery or
1159 enhanced gas recovery well that requests an expansion of the areal extent of an existing aquifer
1160 exemption for the exclusive purpose of Class VI injection for geologic sequestration must define
1161 (by narrative description, illustrations, maps, or other means) and describe in geographic and/or
1162 geometric terms (such as vertical and lateral limits and gradient) that are clear and definite, all
1163 aquifers or parts thereof that are requested to be designated as exempted using the criteria in
1164 subparagraphs (d)(i)(A-C) of this section.

1165

1166 (B) In evaluating a request to expand the areal extent of an aquifer
1167 exemption of a Class II enhanced oil recovery or enhanced gas recovery well for the purpose of
1168 Class VI injection, the Administrator must determine that the request meets the criteria for
1169 exemptions in subparagraphs (d)(i)(A-C) of this section. In making the determination, the
1170 Administrator shall consider:

1171

1172 (I) Current and potential future use of the USDWs to be
1173 exempted as drinking water resources;

1174

1175 (II) The predicted extent of the injected carbon dioxide plume,
1176 and any mobilized fluids that may result in degradation of water quality, over the lifetime of the
1177 geologic sequestration project, as informed by computational modeling performed pursuant to
1178 Section 8(c)(i) of this chapter, in order to ensure that the proposed injection operation will not at
1179 any time endanger USDWs including non-exempted portions of the injection formation;

1180

1181 (III) Whether the areal extent of the expanded aquifer exemption
1182 is of sufficient size to account for any possible revisions to the computational model during
1183 reevaluation of the area of review, pursuant to Section 8(e) of this chapter; and

1184

1185 (IV) Any information submitted to support a waiver request
1186 made by the owner or operator under Section 10 of this chapter, if appropriate.

1187

1188 (d) The Administrator shall notify, in writing, any Tribes within the area of review of
1189 the geologic sequestration project based on information provided in subparagraphs (b)(vii),
1190 (b)(vii)(A), (b)(vii)(B), and (b)(xxxiv) of this section.

1191
1192 (e) Prior to granting approval for the operation of a Class VI well, the Administrator
1193 shall consider the following information:

1194
1195 (i) The final area of review based on modeling, using data obtained during
1196 logging and testing of the well and the formation as required by subparagraphs (b)(xv), (b)(xviii),
1197 (b)(xxiv), and (b)(xxv) of this section;

1198
1199 (ii) Any relevant updates, based on data obtained during logging and testing of
1200 the well and the formation as required by subparagraphs (b)(xv), (b)(xviii), (b)(xxiv), and
1201 (b)(xxv) of this section, to the information on the geologic structure and hydrogeologic
1202 properties of the proposed storage site and overlying formations, submitted to satisfy the
1203 requirements of subparagraph (b)(ix) of this section;

1204
1205 (iii) The results of the formation testing program as required in paragraph
1206 (b)(xvii) of this section;

1207
1208 (iv) Final injection well construction procedures that meet the requirements of
1209 Section 9 of this chapter;

1210
1211 (v) Any updates to the proposed area of review and corrective action plan,
1212 testing and monitoring plan, injection well-plugging plan, post-injection site care and site closure
1213 plan, or the emergency and remedial response plan submitted under paragraph (a) of this section,
1214 which are necessary to address new information collected during logging and testing of the well
1215 and the formation as required by all paragraphs of this section; and

1216
1217 (f) Owners or operators seeking a waiver of the requirement to inject below the
1218 lowermost USDW must also refer to Section 10 of this chapter and submit a supplemental report,
1219 as required at Section 10(a). The supplemental report is not part of the permit application.

1220
1221 (g) An applicant applying for a Class VI well permit must obtain public liability
1222 insurance to cover the geologic sequestration activities for which a permit is sought.

1223
1224 (i) The public liability insurance shall be in addition to the financial
1225 assurance required in Section 19 of this chapter.

1226
1227 (ii) The insurance policy shall provide for personal injury and property
1228 damage protection and shall be in place until a completion and release certificate has been
1229 obtained from the Administrator certifying that plume stabilization has been achieved.

1230
1231 (iii) The minimum insurance coverage for public liability insurance as required
1232 by W.S. § 35-11-313(f)(ii)(O) shall be five hundred thousand dollars (\$500,000) for each
1233 occurrence of bodily injury or property damage, and one million dollars (\$1,000,000) aggregate.

- 1234
1235 (iv) The public liability insurance shall include a rider requiring that the
1236 insurer notify the Administrator whenever substantive changes are made to the policy, including
1237 any termination or failure to renew.
1238
- 1239 (v) Self-insurance in lieu of public liability insurance must meet state or
1240 federal requirements and be approved by the Administrator.
1241
- 1242 (h) All applications for permits, reports, or information to be submitted to the
1243 Administrator shall be signed by a responsible officer as follows:
1244
- 1245 (i) For a corporation - a responsible corporate officer means:
1246
- 1247 (A) A president, secretary, treasurer, or vice president of the
1248 corporation in charge of a principal business function, or any other person who performs similar
1249 policy or decision making functions for the corporation; or
1250
- 1251 (B) The manager of one (1) or more manufacturing, production, or
1252 operating facilities employing more than 250 persons or having gross annual sales or expendi-
1253 tures exceeding \$25 million (in second quarter 1980 dollars), if authority to sign documents has
1254 been assigned or delegated to the manager in accordance with corporate procedures.
1255
- 1256 (ii) For a partnership or sole proprietorship -- by a general partner or the
1257 proprietor, respectively;
1258
- 1259 (iii) For a municipality, state, federal or other public agency -- by either the
1260 principal executive officer or ranking elected official. For the purposes of this section, a principal
1261 executive officer of a Federal agency includes:
1262
- 1263 (A) The chief executive officer of the agency, or
1264
- 1265 (B) A senior executive officer having responsibility for the overall
1266 operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).
1267
- 1268 (iv) A person is authorized as a responsible officer only if:
1269
- 1270 (A) The authorization is made in writing by a person described in
1271 paragraphs (i) through (iii) in this subsection;
1272
- 1273 (B) The authorization specifies either an individual or a position
1274 having responsibility for the overall operation of the regulated facility or activity, such as the
1275 position of plant manager, operator of a well or a well field, superintendent, or position of
1276 equivalent responsibility. (A duly authorized representative may thus be either a named
1277 individual or any individual occupying a named position); and
1278
- 1279 (C) The written authorization is submitted to the Administrator.

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(v) If an authorization under paragraph (iv) of this subsection is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (iv) of this subsection must be submitted to the Administrator prior to or together with any reports, information, or applications to be signed by an authorized representative.

(i) The application shall contain the following certification by the person signing the application:

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

(j) All data used to complete permit applications shall be kept by the applicant for the life of the geologic sequestration project and for ten (10) years following site closure.

Section 6. Prohibitions.

(a) In addition to the requirements in W.S. § 35-11-301(a), no person shall:

(i) Discharge into, construct, operate, or modify any Class VI well unless permitted pursuant to this chapter;

(ii) Discharge to any zone except the authorized discharge zone as described in the permit;

(iii) Conduct any authorized injection activity in a manner that results in a violation of any permit condition, representations made in the application, or the request for coverage under the individual permit. A permit condition supersedes any application content.

(iv) Construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 141 or may otherwise adversely affect the health of persons. The applicant for a permit shall have the burden of showing that the requirements of this paragraph are met.

(b) If any water quality monitoring of an underground source of drinking water indicates the movement of any contaminant into the underground source of drinking water, except as authorized under this chapter, the Administrator shall prescribe such additional requirements for construction, corrective action, operation, monitoring, or reporting (including

1326 closure of the injection well) as are necessary to prevent such movement. In the case of wells
 1327 authorized by permit, these additional requirements shall be imposed by modifying the permit in
 1328 accordance with Section 4 of this chapter, or the permit may be terminated under Section 4 of
 1329 this chapter if cause exists, or appropriate enforcement action may be taken if the permit has
 1330 been violated.

1331
 1332 (c) No person shall inject any hazardous waste that has been banned from land
 1333 disposal pursuant to Wyoming Hazardous Waste Rules Chapter 1.

1334
 1335 (d) The construction of new, or operation or maintenance of any existing Class V
 1336 wells for non-experimental geologic sequestration is prohibited.

1337
 1338 (e) The Administrator may identify (by narrative description, illustrations, maps, or
 1339 other means) and shall protect as underground sources of drinking water, all aquifers and parts of
 1340 aquifers that meet the definition of “underground source of drinking water” in Section 2, except
 1341 to the extent there is expansion to the areal extent of an existing Class II enhanced oil recovery or
 1342 enhanced gas recovery aquifer exemption for the exclusive purpose of Class VI injection for
 1343 geologic sequestration under Section 5(c) of this chapter. Other than EPA-approved aquifer
 1344 exemption expansions that meet the criteria set forth in Section 5(c) of this chapter, new aquifer
 1345 exemptions shall not be issued for Class VI injection wells. Even if an aquifer has not been
 1346 specifically identified by the Administrator, it is an underground source of drinking water if it
 1347 meets the definition in Section 2 of this chapter.

1348
 1349 **Section 7. Minimum Criteria for Siting Class VI Wells.**

1350
 1351 (a) Owners or operators of Class VI wells must demonstrate to the satisfaction of the
 1352 Administrator that the wells will be sited in areas with a suitable geologic system. The geologic
 1353 system must be comprised of:

1354
 1355 (i) An injection zone of sufficient areal extent, thickness, porosity, and
 1356 permeability to receive the total anticipated volume of the carbon dioxide stream; and

1357
 1358 (ii) A confining zone(s) that is free of transmissive faults or fractures and of
 1359 sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced
 1360 formation fluids and allow injection at proposed maximum pressures and volumes without
 1361 initiating or propagating fractures in the confining zone(s) or causing non-transmissive faults to
 1362 become transmissive.

1363
 1364 (b) Owners or operators of Class VI wells must identify and characterize additional
 1365 zones, if they exist, that will impede vertical fluid movement, allow for pressure dissipation, and
 1366 provide additional opportunities for monitoring, mitigation, and remediation. Vertical faults and
 1367 fractures that transect these zones must be identified.

1368
 1369 **Section 8. Area of Review Delineation and Corrective Action.**

1370

1371 (a) The area of review is based on computational modeling that accounts for the
1372 physical and chemical properties of all phases of the injected carbon dioxide stream. The owner
1373 or operator will re-evaluate the area of review at least every two (2) years during the operational
1374 life of the facility, and then no less frequently than every five (5) years through the post-injection
1375 site care period until the geologic sequestration project is closed in accordance with department
1376 rules and regulations.

1377
1378 (b) The owner or operator of a Class VI well must prepare, maintain, and comply
1379 with a plan to delineate the area of review for a proposed geologic sequestration project, re-
1380 evaluate the delineation, and perform corrective action that meets the requirements of this section
1381 and is acceptable to the Administrator. As a part of the permit application for approval by the
1382 Administrator, the owner or operator must submit an area of review and corrective action plan
1383 that includes the following information:

1384
1385 (i) The method for delineating the area of review that meets the requirements
1386 of paragraph (c) of this section, including the name, version and availability of the model to be
1387 used, assumptions that will be made, and the site characterization data on which the model will
1388 be based;

1389
1390 (ii) A description of:

1391
1392 (A) The monitoring and operational conditions that would warrant a re-
1393 evaluation of the area of review prior to the next scheduled re-evaluation as determined by the
1394 minimum fixed frequency established in paragraph (a) of this section.

1395
1396 (B) How monitoring and operational data (e.g., injection rate and
1397 pressure) will be used to evaluate the area of review; and

1398
1399 (C) How corrective action will be conducted to meet the requirements
1400 of paragraph (c)(v) of this section, including:

1401
1402 (I) What corrective action will be performed prior to injection;

1403
1404 (II) What, if any, portions of the area of review will have
1405 corrective action addressed on a phased basis, and how the phasing will be determined;

1406
1407 (III) How corrective action will be adjusted if there are changes
1408 in the area of review; and

1409
1410 (IV) How site access will be ensured for future corrective action.

1411
1412 (c) Owners or operators of Class VI wells must perform the following actions to
1413 delineate the area of review, identify all wells that require corrective action, and perform
1414 corrective action on those wells:

1415
1416 (i) Predict, using computational modeling:

- 1417
1418 (A) The projected lateral and vertical migration of the carbon dioxide
1419 plume and formation fluids in the subsurface from the commencement of injection activities until
1420 the plume movement ceases;
1421
1422 (B) The pressure differentials, and demonstrate that pressure
1423 differentials sufficient to cause the movement of injected fluids or formation fluids into a USDW
1424 or to otherwise threaten human health, safety, or the environment will not be present (or for a
1425 fixed time period as determined by the Administrator);
1426
1427 (C) The potential need for brine removal, and;
1428
1429 (D) The long-term effects of pressure buildup if brine is not removed.
1430
1431 (ii) The modeling must:
1432
1433 (A) Be based on:
1434
1435 (I) Detailed geologic data available or collected to characterize
1436 the injection zone, confining zone and any additional zones; and
1437
1438 (II) Anticipated operating data, including injection pressures,
1439 rates and total volumes over the proposed operational life of the facility.
1440
1441 (B) Take into account any relevant geologic heterogeneities, other
1442 discontinuities, data quality, and their possible impact on model predictions; and
1443
1444 (C) Consider potential migration through faults, fractures, and artificial
1445 penetrations.
1446
1447 (iii) Using methods approved by the Administrator, identify all penetrations,
1448 including active and abandoned wells and underground mines, in the area of review that may
1449 penetrate the confining zone. Provide a description of each well's type, construction, date drilled,
1450 location, depth, record of plugging and/or completion, and any additional information the
1451 Administrator may require; and
1452
1453 (iv) Determine which abandoned wells in the area of review have been
1454 plugged in a manner that prevents the movement of:
1455
1456 (A) Carbon dioxide that may endanger USDWs or otherwise threaten
1457 human health, safety, or the environment; or
1458
1459 (B) Displaced formation fluids, or other fluids, including the use of
1460 materials compatible with the carbon dioxide stream, that may endanger USDWs or otherwise
1461 threaten human health, safety, or the environment.
1462

1463 (v) Owners or operators of Class VI wells that are determined to need
1464 corrective action using methods that are approved by the Administrator, must perform corrective
1465 action on all wells in the area of review to prevent the movement of fluid into or between
1466 USDWs including use of materials compatible with the carbon dioxide stream, where
1467 appropriate.
1468

1469 (d) At a fixed frequency, not to exceed two (2) years during the operational life of the
1470 facility, or five (5) years during the post-injection site care period (until site closure) as specified
1471 in the area of review and corrective action plan, or when monitoring and operational conditions
1472 warrant, owners or operators must:

1473 (i) Re-evaluate the area of review in the same manner specified in paragraph
1474 (c)(i) of this section;

1475 (ii) Identify all wells in the re-evaluated area of review that require corrective
1476 action in the same manner specified in paragraph (c)(iv) of this section;

1477 (iii) Perform corrective action on wells requiring corrective action in the
1478 reevaluated area of review in the same manner specified in paragraph (c)(v) of this section; and
1479

1480 (iv) Submit an amended area of review and corrective action plan or
1481 demonstrate to the Administrator through monitoring data and modeling results that no change to
1482 the area of review and corrective action plan is needed.

1483 (A) Any amendments to the area of review and corrective action plan
1484 must be approved by the Administrator;

1485 (B) Any amendments to the area of review must be incorporated into
1486 the permit; and

1487 (C) Any amendments to the area of review are subject to the permit
1488 modification requirements of Section 4 of this chapter, as appropriate.
1489

1490 (e) The emergency and remedial response plan (as required by Section 18 of this
1491 chapter) and a demonstration of financial responsibility (as described by Section 19 of this
1492 chapter) must account for the entire area of review (as modified), regardless of whether or not
1493 corrective action in the area of review is phased.
1494

1495 (f) All modeling inputs and data used to support area of review reevaluations under
1496 paragraph (d) of this section shall be retained for ten (10) years.
1497

1503 **Section 9. Construction and Operation Standards for Class VI Wells.**

1504 (a) The owner or operator must ensure that all Class VI wells are designed, at a
1505 minimum, to the construction standards set forth by the Department and the Wyoming Oil and
1506 Gas Conservation Commission, as applicable, and constructed and completed to:
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(i) Prevent the movement of fluids into or between USDWs or into any unauthorized zones;

(ii) Permit the use of appropriate testing devices and workover tools; and

(iii) Permit continuous monitoring of the annulus space between the injection tubing and long string casing.

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

(i) All well materials must be compatible with fluids with which the materials may be expected to come into contact, and meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Administrator.

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

(iii) In order to allow the Administrator to determine and specify casing and cementing requirements, the owner or operator must provide the following information:

(A) Depth to the injection zone;

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

(C) Hole size;

(D) Size and grade of all casing strings (wall thickness, external diameter, nominal weight, length, joint specification and construction material), including whether the casing is new, or used;

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

(F) Down-hole temperatures and pressures;

(G) Lithology of injection and confining zones;

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

(I) Quantity, chemical composition, and temperature of the carbon dioxide stream.

1554 (iv) Casing must extend through the base of the lowermost USDW above the
1555 injection zone and be cemented to the surface through the use of a single or multiple strings of
1556 casing and cement.

1557
1558 (v) At least one (1) long string casing, using a sufficient number of
1559 centralizers, must be set in a manner so as to create a cement bond through the overlying and/or
1560 underlying confining zones(s). The long string casing must extend to the injection zone, must be
1561 cemented by circulating cement to the surface in one (1) or more stages, and must be isolated by
1562 placing cement and/or other isolation techniques as necessary to provide adequate isolation of
1563 the injection zone and provide for protection of USDWs, human health, safety, and the
1564 environment.

1565
1566 (A) Circulation of cement may be accomplished by staging. The
1567 Administrator may approve an alternative method of cementing in cases where the cement
1568 cannot be recirculated to the surface, provided the owner or operator can demonstrate by using
1569 logs that the cement does not allow fluid movement behind the wellbore.

1570
1571 (vi) Cement and cement additives must be suitable for use with the carbon
1572 dioxide stream and formation fluids and of sufficient quality and quantity to maintain integrity
1573 over the operating life of the well.

1574
1575 (vii) The integrity and location of the cement shall be verified using technology
1576 capable of evaluating cement quality radially with sufficient resolution to identify the location of
1577 channels, voids, or other areas of missing cement to ensure that USDWs are not endangered and
1578 that human health, safety, and the environment are protected.

1579
1580 (c) All owners and operators of Class VI wells must inject fluids through tubing with
1581 a packer set at a depth opposite a cemented interval at the location approved by the
1582 Administrator.

1583
1584 (i) Tubing and packer materials used in the construction of each Class VI
1585 well must be compatible with fluids with which the materials may be expected to come into
1586 contact and must meet or exceed standards developed for such materials by the American
1587 Petroleum Institute, ASTM International, or comparable standards acceptable to the
1588 Administrator.

1589
1590 (ii) In order for the Administrator to determine and specify requirements for
1591 tubing and packer, the owner or operator must submit the following information:

1592
1593 (A) Depth of setting;

1594
1595 (B) Characteristics of the carbon dioxide stream (e.g., chemical
1596 content, corrosiveness, temperature, and density) and formation fluids;

1597
1598 (C) Maximum proposed injection pressure;

1599

- 1600 (D) Maximum proposed annular pressure;
- 1601
- 1602 (E) Maximum proposed injection rate (intermittent or continuous) and
- 1603 volume of the carbon dioxide stream;
- 1604
- 1605 (F) Size of tubing and casing; and
- 1606
- 1607 (G) Tubing tensile, burst, and collapse strengths.
- 1608

1609 **Section 10. Class VI Injection Depth Waiver Requirements.**

1610

1611 (a) The owner and/or operator seeking a waiver of the requirement to inject below the

1612 lowermost USDW shall submit a supplemental report concurrent with the permit application.

1613 The report shall contain the following:

1614

1615 (i) A demonstration that the injection zones are laterally continuous, is not a

1616 USDW, and is not hydraulically connected to USDWs; does not outcrop within the area of

1617 review; has adequate injectivity, volume, and sufficient porosity to safely contain the injected

1618 carbon dioxide and formation fluids; and has appropriate geochemistry.

1619

1620 (ii) A demonstration that the injection zones are bounded by laterally

1621 continuous, impermeable confining units above and below the injection zones adequate to

1622 prevent fluid movement and pressure buildup outside of the injection zones; and that the

1623 confining unit(s) is/are free of transmissive faults and fractures. The report shall further

1624 characterize the regional fracture properties and contain a demonstration that the fractures will

1625 not interfere with injection, serve as conduits, or endanger USDWs.

1626

1627 (iii) A computer model demonstrating that USDWs above and below the

1628 injection zone will not be endangered as a result of fluid movement. The modeling shall be done

1629 in conjunction with the area of review determination, as described in Section 8 of this chapter,

1630 and is subject to requirements, as described in Section 8(c) of this chapter, and periodic

1631 reevaluation, as described in Section 8(e) of this chapter.

1632

1633 (iv) A demonstration that well design and construction, in conjunction with the

1634 waiver, will ensure isolation of the injectate in lieu of the requirements of Section 9(a)(i) of this

1635 chapter and will meet the well construction requirements of paragraph (e) of this section.

1636

1637 (v) A description of how the monitoring and testing and any additional plans

1638 will be tailored to this geologic sequestration project to ensure protection of USDWs above and

1639 below the injection zone.

1640

1641 (vi) Information on the location of all public water supplies affected,

1642 reasonably likely to be affected, or served by USDWs in the area of review.

1643

1644 (vii) Any other information requested by the Administrator.

1645

1646 (b) To inform the EPA Regional Administrator’s decision on whether to grant a
1647 waiver of the injection depth requirements of 40 CFR §§ 144.6, 146.5(f), and 146.86(a)(1), the
1648 Administrator must submit, to the EPA Regional Administrator, documentation of the following:
1649

1650 (i) An evaluation of the following information as it relates to siting,
1651 construction, and operation of a geologic sequestration project with a waiver:
1652

1653 (A) The integrity of the upper and lower confining units;
1654

1655 (B) The suitability of the injection zone(s) (e.g., lateral continuity; lack
1656 of transmissive faults and fractures; knowledge of current or planned artificial penetrations into
1657 the injection zone(s) or formations below the injection zone);
1658

1659 (C) The potential capacity of the geologic formation(s) to sequester
1660 carbon dioxide, accounting for the availability of alternative injection sites;
1661

1662 (D) All other site characterization data, the proposed emergency and
1663 remedial response plan, and a demonstration of financial responsibility;
1664

1665 (E) Community needs, demands, and supply from drinking water
1666 resources;
1667

1668 (F) Planned needs, potential and/or future use of USDWs and non-
1669 USDWs in the area;
1670

1671 (G) Planned or permitted water, hydrocarbon, or mineral resource
1672 exploitation potential of the proposed injection formation(s) and other formations both above and
1673 below the injection zone to determine if there are any plans to drill through the formation to
1674 access resources in or beneath the proposed injection zone(s)/formation(s);
1675

1676 (H) The proposed plan for securing alternative resources or treating
1677 USDW formation waters in the event of contamination related to the Class VI injection activity;
1678 and

1679 (I) Any other applicable considerations or information requested by
1680 the Administrator.
1681

1682 (ii) Consultation with the Public Water System Supervision Directors of all
1683 States and Tribes having jurisdiction over lands within the area of review of a well for which a
1684 waiver is sought.
1685

1686 (iii) Any written waiver-related information submitted by the Public Water
1687 System Supervision Director(s) to the (UIC) Director.
1688

1689 (c) Concurrent with the Class VI permit application public notice process, the
1690 Administrator shall give public notice that an injection depth waiver request has been submitted.
1691 The notice shall clearly state:

- 1692
- 1693 (i) The depth of the proposed injection zone(s);
- 1694
- 1695 (ii) The location of the injection wells;
- 1696
- 1697 (iii) The name and depth of all USDWs within the area of review;
- 1698
- 1699 (iv) A map of the area of review;
- 1700
- 1701 (v) The names of any public water supplies affected, reasonably likely to be
- 1702 affected, or served by the USDWs in the area of review; and
- 1703
- 1704 (vi) The results of any consultation between the UIC program and the Public
- 1705 Water System Supervision program within the area of review.
- 1706
- 1707 (d) Following the injection depth waiver application public notice, the Administrator
- 1708 of the Water Quality Division of the Department of Environmental Quality shall provide all the
- 1709 information received through the waiver application process to the US EPA Regional
- 1710 Administrator. Based on the information provided, the US EPA Regional Administrator shall
- 1711 provide written concurrence or non-concurrence regarding waiver issuance.
- 1712
- 1713 (i) If the US EPA Regional Administrator requires additional information to
- 1714 make a decision, the Administrator of the Water Quality Division of the Department of
- 1715 Environmental Quality shall provide the information. The US EPA Regional Administrator may
- 1716 require public notice of the new information.
- 1717
- 1718 (ii) The Administrator of the Water Quality Division of the Department of
- 1719 Environmental Quality shall not issue a depth injection waiver without receipt of written
- 1720 concurrence from the US EPA Regional Administrator.
- 1721
- 1722 (e) If an injection depth waiver is issued, within thirty (30) days of issuance, the EPA
- 1723 shall post the following information on the Office of Water's website:
- 1724
- 1725 (i) The depth of the proposed injection zone(s).
- 1726
- 1727 (ii) The location of the injection wells.
- 1728
- 1729 (iii) The name and depth of all USDWs within the area of review.
- 1730
- 1731 (iv) A map of the area of review.
- 1732
- 1733 (v) The names of any public water supplies affected, reasonably likely to be
- 1734 affected, or served by the USDWs in the area of review.
- 1735
- 1736 (vi) The date of waiver issuance.
- 1737

1738 (f) Upon receipt of a waiver of the requirement to inject below the lowermost USDW
1739 for geologic sequestration, the owner or operator of a Class VI well must comply with the
1740 following:

1741
1742 (i) All requirements of Sections 8, 11, 12, 13, 15, 16, 18, and 19 of this
1743 chapter.

1744
1745 (ii) All the requirements of Section 9 of this chapter with the following
1746 modified requirements:

1747
1748 (A) The Class VI well shall be constructed and completed to prevent
1749 the movement of fluids into any unauthorized zones including USDWs, in lieu of requirements
1750 of Section 9(a)(i) of this chapter.

1751
1752 (B) The casing and cementing program shall be designed to prevent the
1753 movement of fluids into any unauthorized zones including USDWs, in lieu of requirements of
1754 Section 9(b) and 9(b)(i) of this chapter.

1755
1756 (C) The casing shall extend through the base of the nearest USDW
1757 directly above the injection zone and shall be cemented to the surface; or at the Administrator's
1758 discretion, another formation above the injection zone and below the nearest USDW above the
1759 injection zone.

1760
1761 (iii) All the requirements of Section 14 of this chapter with the following
1762 modified requirements:

1763
1764 (A) The owner or operator shall monitor the groundwater quality,
1765 geochemical changes, and pressure in the first USDWs immediately above and below the
1766 injection zone(s); and any other formation at the discretion of the Administrator.

1767
1768 (B) The owner or operator shall conduct testing and monitoring to
1769 track the extent of the carbon dioxide plume and the presence or absence of elevated pressure
1770 (e.g., the pressure front) by using direct methods to monitor for pressure changes in the injection
1771 zone(s); and, indirect methods (e.g., seismic, electrical, gravity, or electromagnetic surveys
1772 and/or down-hole carbon dioxide detection tools), unless the Administrator determines, based on
1773 site-specific geology, that such methods are not appropriate.

1774
1775 (iv) All requirements of Section 17 of this chapter with the following,
1776 modified post-injection site care monitoring requirements:

1777
1778 (A) The owner or operator shall monitor the groundwater quality,
1779 geochemical changes and pressure in the first USDWs immediately above and below the
1780 injection zone; and in any other formations at the discretion of the Administrator.

1781
1782 (B) Testing and monitoring to track the extent of the carbon dioxide
1783 plume and the presence or absence of elevated pressure (e.g., the pressure front) by using direct

1784 methods in the injection zone(s); and indirect methods (e.g., seismic, electrical, gravity, or
 1785 electromagnetic surveys and/or down-hole carbon dioxide detection tools), unless the
 1786 Administrator determines based on site-specific geology, that such methods are not appropriate;

1787

1788 (v) Any additional requirements requested by the Administrator to ensure
 1789 protection of USDWs above and below the injection zone(s).

1790

1791 **Section 11. Logging, Sampling, and Testing Prior to Injection Well Operation.**

1792

1793 (a) During the drilling and construction of a Class VI injection well, the owner or
 1794 operator must run appropriate logs, surveys and tests to determine or verify the depth, thickness,
 1795 porosity, permeability, and lithology of, and the salinity of any formation fluids in all relevant
 1796 geologic formations in order to ensure conformance with the injection well construction
 1797 requirements under Section 9 of this chapter, and to establish accurate baseline data against
 1798 which future measurements may be compared. The owner or operator must submit to the
 1799 Administrator a descriptive report prepared by a knowledgeable log analyst that includes an
 1800 interpretation of the results of such logs and tests. At a minimum, such logs and tests must
 1801 include:

1802

1803 (i) Deviation checks measured during drilling on all holes constructed by
 1804 drilling a pilot hole that is subsequently enlarged by reaming or another method. Such checks
 1805 must be at sufficiently frequent intervals to determine the location of the borehole and to ensure
 1806 that vertical avenues for fluid movement in the form of diverging holes are not created during
 1807 drilling; and

1808

1809 (ii) Before and upon installation of the surface casing:

1810

1811 (A) Resistivity, spontaneous potential, and caliper logs before the
 1812 casing is installed; and

1813

1814 (B) A cement bond and variable density log, or other approved device
 1815 to evaluate cement quality radially with sufficient resolution to identify channels, voids, or other
 1816 areas of missing cement, and a temperature log, after the casing is set and cemented.

1817

1818 (iii) Before and upon installation of the long string casing:

1819

1820 (A) Resistivity, spontaneous potential, porosity, caliper, gamma ray,
 1821 fracture finder logs, and any other logs the Administrator requires for the given geology before
 1822 the casing is installed; and

1823

1824 (B) A cement bond and variable density log, and a temperature log
 1825 after the casing is set and cemented.

1826

1827 (iv) Test(s) designed to demonstrate the internal and external mechanical
 1828 integrity of injection wells, which may include:

1829

- 1830 (A) A pressure test with liquid or gas;
1831
1832 (B) A tracer survey, such as oxygen-activation logging;
1833
1834 (C) A temperature or noise log; and
1835
1836 (D) A casing inspection log.
1837
1838 (v) Any alternative methods that provide equivalent or better information and
1839 that are required of, and/or approved by the Administrator.
1840
1841 (b) The owner or operator must take whole cores or sidewall cores of the injection
1842 zone and confining system, and formation fluid samples from the injection zone(s), and submit to
1843 the Administrator a detailed report prepared by a log analyst that includes:
1844
1845 (i) Well log analyses (including well logs);
1846
1847 (ii) Core analyses; and
1848
1849 (iii) Formation fluid sample information.
1850
1851 (iv) The Administrator may accept data from cores and fluid samples from
1852 nearby wells if the owner or operator can demonstrate that such data are representative of
1853 conditions in the wellbore.
1854
1855 (c) The owner or operator must record the formation fluid temperature, formation
1856 fluid pH and conductivity, reservoir pressure, and static fluid level of the injection zone(s).
1857
1858 (d) The owner or operator must determine fracture pressures of the injection and
1859 confining zones and verify hydrogeologic and geo-mechanical characteristics of the injection
1860 zone by conducting a pressure fall-off test, any other information requested by the Administrator;
1861 and,
1862
1863 (i) A pump test; or
1864
1865 (ii) Injectivity tests.
1866
1867 (e) The owner or operator must provide the Administrator with the opportunity to
1868 witness all logging and testing by this section. The owner or operator must submit a schedule of
1869 such activities to the Administrator prior to conducting the first test and notify the Administrator
1870 of any changes to the schedule thirty (30) days prior to the next scheduled test.
1871

1872 **Section 12. Injection Well Operating Requirements.**
1873

1874 (a) The owner or operator must ensure that injection pressure does not exceed ninety
1875 (90) percent of the fracture pressure of the injection zone(s) so as to ensure that the injection
1876 does not initiate new fractures or propagate existing fractures in the injection zone(s).

1877

1878 (i) In no case may injection pressure cause movement of injection or
1879 formation fluids in a manner that endangers a USDW, or otherwise threatens human health,
1880 safety, or the environment.

1881

1882 (ii) In no case may injection pressure initiate fractures in the confining zone(s)
1883 or cause the movement of injectate or formation fluids that endangers a USDW or otherwise
1884 threatens human health, safety, or the environment.

1885

1886 (b) Injection of the carbon dioxide stream between the outermost casing protecting
1887 USDWs and the wellbore is prohibited.

1888

1889 (c) The owner or operator must fill the annulus between the tubing and the long string
1890 casing with a non-corrosive fluid approved by the Administrator. The owner or operator must
1891 maintain on the annulus a pressure that exceeds the operating injection pressure, unless the
1892 Administrator determines that such requirement might harm the integrity of the well or endanger
1893 USDWs.

1894

1895 (d) Other than during periods of well workover or maintenance approved by the
1896 Administrator in which the sealed tubing-casing annulus is, by necessity, disassembled for
1897 maintenance or corrective procedures, the owner or operator must maintain mechanical integrity
1898 of the injection well at all times.

1899

1900 (e) The owner or operator must install and use continuous recording devices to
1901 monitor:

1902

1903 (i) Injection pressure; and

1904

1905 (ii) Rate, volume, and temperature of the carbon dioxide stream.

1906

1907 (f) The owner or operator must install and use continuous recording devices to
1908 monitor the pressure on the annulus between the tubing and the long string casing and annulus
1909 fluid volume.

1910

1911 (g) The owner or operator must install, test, and use alarms and automatic surface
1912 shut-off systems, or at the discretion of the Administrator use down-hole shut-off systems (e.g.,
1913 automatic shut-off, check valves), or other mechanical devices that provide equivalent
1914 protection, designed to alert the operator and shut-in the well when operating parameters such as
1915 injection rate, injection pressure, or other parameters approved by the Administrator diverge
1916 beyond ranges and/or gradients specified in the permit.

1917

1918 (h) If an automatic shutdown is triggered or a loss of mechanical integrity is
1919 discovered, the owner or operator must immediately investigate and identify as expeditiously as

possible the cause. If, upon such investigation, the well appears to be lacking mechanical integrity, or if monitoring required under paragraphs (e), (f), and (g) of this section otherwise indicates that the well may be lacking mechanical integrity, the owner or operator must:

- (i) Immediately cease injection;
- (ii) Take all steps reasonably necessary to determine whether there may have been a release of the injected carbon dioxide stream or formation fluids into any unauthorized zone;
- (iii) Notify the Administrator within twenty-four (24) hours;
- (iv) Restore and demonstrate mechanical integrity to the satisfaction of the Administrator as soon as practicable and prior to resuming injection; and
- (v) Notify the Administrator when injection can be expected to resume.

Section 13. Mechanical Integrity.

- (a) A Class VI well has mechanical integrity if:
 - (i) There is no significant leak in the casing, tubing, or packer; and
 - (ii) There is no significant fluid movement into a USDW through channels adjacent to the injection wellbore.
- (b) To evaluate the absence of significant leaks under paragraph (a)(i) of this section, owners or operators must, following an initial annulus pressure test, continuously monitor injection pressure, rate, injected volumes, and pressure on the annulus between tubing and long string casing and annulus fluid volume as specified in Section 12 (e) and (f) of this chapter;
- (c) At least once per year, the owner or operator must 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 14 of this chapter, the owner or operator must 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 paragraph (a)(i) or (a)(ii) of this section. Also, the Administrator may allow the use of a test to demonstrate mechanical integrity other than those listed above, with the written approval

1966 of the US EPA Administrator. To obtain approval, the Administrator must submit a written
 1967 request to the US EPA Administrator that must set forth the proposed test and all technical data
 1968 supporting its use.

1969
 1970 (f) In conducting and evaluating the tests enumerated in this section or others to be
 1971 allowed by the Administrator, the owner or operator and the Administrator must apply methods
 1972 and standards generally accepted in the industry.

1973
 1974 (i) When the owner or operator reports the results of mechanical integrity
 1975 tests to the Administrator, he/she shall include a description of the test(s) and the method(s) used.

1976
 1977 (ii) In making his/her evaluation, the Administrator must review monitoring
 1978 and other test data submitted since the previous evaluation.

1979
 1980 (g) The Administrator may require additional or alternative tests if the results
 1981 presented by the owner or operator under paragraph (e) of this section are not satisfactory to the
 1982 Administrator to demonstrate that there is no significant leak in the casing, tubing or packer, or
 1983 significant movement of fluid into or between USDWs resulting from the injection activity as
 1984 stated in paragraphs (a)(i) and (a)(ii) of this section.

1985
 1986 **Section 14. Testing and Monitoring Requirements.**

1987
 1988 (a) The owner or operator of a Class VI well must prepare, maintain, and comply
 1989 with a testing and monitoring plan to verify that the geologic sequestration project is operating as
 1990 permitted and is not endangering USDWs. The testing and monitoring plan must be submitted
 1991 with the permit application, for Administrator approval, and must include a description of how
 1992 the owner or operator will meet the requirements of this section, including accessing sites for all
 1993 necessary monitoring and testing during the life of the project.

1994
 1995 (b) Testing and monitoring associated with geologic sequestration projects must, at a
 1996 minimum, include:

1997
 1998 (i) Plans and procedures for environmental surveillance and excursion
 1999 detection, prevention, and control programs, including a monitoring plan to:

2000
 2001 (A) Assess the migration of the injected carbon dioxide; and

2002
 2003 (B) Ensure the retention of the carbon dioxide in the geologic
 2004 sequestration site.

2005
 2006 (ii) Analysis of the carbon dioxide stream with sufficient frequency to yield
 2007 data representative of its chemical and physical characteristics;

2008
 2009 (iii) Installation and use, except during well workovers, of continuous
 2010 recording devices to monitor:

2011

- 2012 (A) Injection pressure;
2013
2014 (B) Rate and volume;
2015
2016 (C) Pressure on the annulus between the tubing and the long string
2017 casing;
2018
2019 (D) The annulus fluid volume added; and
2020
2021 (E) The pressure on the annulus between the tubing and the long string
2022 casing.
2023
2024 (iv) Corrosion monitoring of the well materials for loss of mass, thickness,
2025 cracking, pitting, and other signs of corrosion must be performed and recorded at least quarterly
2026 to ensure that the well components meet the minimum standards for material strength and
2027 performance set forth in Section 9(b) of this chapter by:
2028
2029 (A) Analyzing coupons of the well construction materials placed in
2030 contact with the carbon dioxide stream;
2031
2032 (B) Routing the carbon dioxide stream through a loop constructed with
2033 the material used in the well and inspecting the materials in the loop; or
2034
2035 (C) Using an alternative method approved by the Administrator.
2036
2037 (v) Periodic monitoring of the groundwater quality and geochemical changes
2038 above the confining zone(s) that may be a result of carbon dioxide movement or displaced
2039 formation fluid movement through the confining zone(s) or additional identified zones including:
2040
2041 (A) The location and number of monitoring wells must be based on
2042 specific information about the geologic sequestration project, including injection rate and
2043 volume, geology, the presence of artificial penetrations and other relevant factors; and
2044
2045 (B) The monitoring frequency and spatial distribution of monitoring
2046 wells based on baseline geochemical data that have been collected under Section 5(b)(xiii) of this
2047 chapter and any modeling results in the area of review evaluation required by Section 8(c) of this
2048 chapter.
2049
2050 (vi) A demonstration of external mechanical integrity pursuant to Section
2051 13(c) at least once per year until the well is plugged; and if required by the Administrator, a
2052 casing inspection log pursuant to requirements of Section 13(d) of this chapter at a frequency
2053 established in the testing and monitoring plan;
2054
2055 (vii) A pressure fall-off test that identifies reservoir conditions with respect to
2056 flow dynamics at least once every five (5) years unless more frequent testing is required by the
2057 Administrator based on site-specific information; and

2058
2059 (viii) Testing and monitoring to track the extent of the carbon dioxide plume,
2060 the position of the pressure front, and surface displacement using:

2061 (A) Direct methods in the injection zone(s); and

2062 (B) Indirect methods (e.g., seismic, electrical, gravity, or
2063 electromagnetic surveys and/or down-hole carbon dioxide detection tools), unless the
2064 Administrator determines, based on site-specific geology, that such methods are not appropriate;

2065 (ix) At the Administrator's discretion, based on site-specific conditions,
2066 surface air monitoring and/or soil gas monitoring to detect movement of carbon dioxide that
2067 could endanger a USDW, or otherwise threaten human health, safety, or the environment.

2068 (A) The surface air or soil gas monitoring plan must be based on
2069 potential risks to USDWs, and modeling within the area of review;

2070 (B) The monitoring frequency and spatial distribution of surface air
2071 monitoring and/or soil gas monitoring must reflect baseline data. The monitoring plan must
2072 specify how the proposed monitoring will yield useful information on the area of review
2073 delineation and the potential movement of fluid containing any contaminant into USDWs in
2074 exceedence of any primary drinking water regulation under 40 CFR Part 141, or which may
2075 otherwise adversely affect human health, safety, or the environment.

2076 (x) If an owner or operator demonstrates that monitoring employed under 40
2077 CFR §§ 98.440 to 98.449 (Clean Air Act, 42 U.S.C. 7401 et seq.) accomplishes the goals of
2078 (b)(ix)(A) and (B) of this section, and meets the requirements pursuant to 40 CFR § 146.91(c)(5),
2079 the Administrator that requires surface air/soil gas monitoring must approve the use of
2080 monitoring employed under 40 CFR §§ 98.440 to 98.449. Compliance with §§ 98.440 to 98.449
2081 pursuant to this provision is considered a condition of the Class VI permit;

2082 (xi) Any additional monitoring, as required by the Administrator, necessary to
2083 support, upgrade, and improve computational modeling of the area of review re-evaluation
2084 required under Section 8(d) of this chapter and as necessary to demonstrate that there is no
2085 movement of fluid containing any contaminant into underground sources of drinking water in
2086 exceedence of any primary drinking water regulation under 40 CFR Part 141, or which could
2087 otherwise adversely affect human health, safety, or the environment;

2088 (xii) The owner or operator shall periodically review the testing and monitoring
2089 plan to incorporate monitoring data collected under this subpart, operational data collected under
2090 Section 11 of this chapter, and the most recent area of review reevaluation performed under
2091 Section 8 of this chapter. In no case shall the owner or operator review the testing and
2092 monitoring plan less often than once every five (5) years. Based on this review, the owner or
2093 operator shall submit an amended testing and monitoring plan or demonstrate to the
2094 Administrator that no amendment to the testing and monitoring plan is needed. Any amendments
2095 to the testing and monitoring plan must be approved by the Administrator, must be incorporated

2104 into the permit, and are subject to the permit modification requirements of Section 4 of this
2105 chapter, as appropriate. Amended plans or demonstrations shall be submitted to the
2106 Administrator as follows:

- 2107
- 2108 (A) Within one (1) year of an area of review reevaluation;
- 2109
- 2110 (B) Following any significant changes to the facility, such as addition
2111 of monitoring wells or newly permitted injection wells within the area of review, on a schedule
2112 determined by the Administrator; or
- 2113
- 2114 (C) When required by the Administrator.
- 2115

2116 (xiii) A quality assurance and surveillance plan for all testing and monitoring
2117 requirements.

2118

2119 (c) The permittee shall retain records of all monitoring information, including the
2120 following:

2121

2122 (i) Calibration and maintenance records and all original strip chart recordings
2123 for continuous monitoring instrumentation, copies of all reports required by this permit, and
2124 records of all data used to complete the application for this permit, for a period of at least three
2125 (3) years from the date of the sample, measurement, report, or application. This period may be
2126 extended by request of the Administrator at any time; and

2127

2128 (ii) The nature and composition of all injected fluids until three (3) years after
2129 the completion of any plugging and abandonment procedures specified under Section 16 of this
2130 chapter. The Administrator may require the owner or operator to deliver the records to the
2131 Administrator at the conclusion of the retention period.

2132

2133 (d) Records of monitoring information shall include:

- 2134
- 2135 (i) The date, exact place, and time of sampling or measurements;
- 2136
- 2137 (ii) The individual(s) who performed the sampling or measurements;
- 2138
- 2139 (iii) The date(s) analyses were performed;
- 2140
- 2141 (iv) The individual(s) who performed the analyses;
- 2142
- 2143 (v) The analytical techniques or methods used; and
- 2144
- 2145 (vi) The results of such analyses.
- 2146

2147 **Section 15. Reporting Requirements.**

2148

2149 (a) The owner or operator must, at a minimum, provide the following reports to the
2150 Administrator, for each permitted Class VI well:

2151
2152 (i) Semi-annual reports, which are required by the permit shall be submitted
2153 to the Administrator within thirty (30) days following the end of the period covered in the report,
2154 and shall contain:

2155
2156 (A) Any changes to the physical, chemical, and other relevant
2157 characteristics of the carbon dioxide stream from the proposed operating data;

2158
2159 (B) Monthly average, maximum and minimum values for injection
2160 pressure, flow rate and volume, and annular pressure;

2161
2162 (C) A description of any event that exceeds operating parameters for
2163 annulus pressure or injection pressure as specified in the permit;

2164
2165 (D) A description of any event that triggers a shutdown device required
2166 pursuant to Section 12(g) of this chapter, and the response taken;

2167
2168 (E) The monthly volume of the carbon dioxide stream injected over the
2169 reporting period and project cumulatively;

2170
2171 (F) Monthly annulus fluid volume added; and

2172
2173 (G) The results of monitoring prescribed under Section 14 of this
2174 chapter.

2175
2176 (ii) Report, within thirty (30) days the results of:

2177
2178 (A) Periodic tests of mechanical integrity;

2179
2180 (B) Any other test of the injection well conducted by the permittee if
2181 required by the Administrator; and

2182
2183 (C) Any well workover.

2184
2185 (iii) Report, within twenty-four (24) hours:

2186
2187 (A) Any evidence that the injected carbon dioxide stream or associated
2188 pressure front may cause an endangerment to a USDW;

2189
2190 (B) Any noncompliance with a permit condition, or malfunction of the
2191 injection system, which may cause fluid migration into or between USDWs;

2192
2193 (C) Any triggering of a shut-off system (i.e., down-hole or at the
2194 surface);

2195
2196 (D) Pursuant to compliance with the requirement at Section 14(b)(x) of
2197 this chapter for surface air or soil gas monitoring or other monitoring technologies, if required by
2198 the Administrator, any release of carbon dioxide to the atmosphere or biosphere.

2199
2200 (iv) Owners or operators must notify the Administrator in writing thirty (30)
2201 days in advance of:

2202
2203 (A) Any planned well workover;

2204
2205 (B) Any planned stimulation activities, other than stimulation for
2206 formation testing conducted under Section 5 of this chapter; and

2207
2208 (C) Any other planned test of the injection well conducted by the
2209 permittee.

2210
2211 (c) Owners or operators must submit all required reports, submittals, and notifications
2212 to both the Administrator and to EPA, in an electronic format acceptable to the EPA.

2213
2214 (d) The permittee shall submit a written report to the Administrator of all remedial
2215 work concerning the failure of equipment or operational procedures that resulted in a violation of
2216 a permit condition, at the completion of the remedial work.

2217
2218 (e) For any aborted or curtailed operation, a complete report shall be submitted
2219 within thirty (30) days of complete termination of the discharge or associated activity.

2220
2221 (f) The permittee shall retain all monitoring records required by the permit for a
2222 period of ten (10) years following site closure. The Administrator may require the owner or
2223 operator to deliver the records to the Administrator at the conclusion of the retention period.

2224
2225 **Section 16. Injection Well-plugging.**

2226
2227 (a) Prior to the well-plugging, the owner or operator must flush each Class VI
2228 injection well with a buffer fluid, determine bottom hole reservoir pressure, and perform a final
2229 external mechanical integrity test in accordance with Section 13 of this chapter.

2230
2231 (b) The owner or operator of a Class VI well must 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 acceptable to the Administrator. Temporary or intermittent cessation of injection
2234 operations is not abandonment. The well-plugging plan must include the following 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 13 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;
- 2248
- 2249 (vi) A description of the method of placement of the plugs.
- 2250
- 2251 (c) The owner or operator must notify the Administrator, in writing, at least sixty (60)
- 2252 days before plugging a well.
- 2253
- 2254 (i) If any changes have been made to the original well-plugging plan, the
- 2255 owner or operator must also provide the revised well-plugging plan.
- 2256
- 2257 (ii) At the discretion of the Administrator, a shorter notice period may be
- 2258 allowed.
- 2259
- 2260 (iii) Any amendments to the injection well-plugging plan must be approved by
- 2261 the Administrator, must be incorporated into the permit, and are subject to the permit
- 2262 modification requirements of Section 4 of this chapter, as appropriate.
- 2263
- 2264 (d) Within sixty (60) days after completion of plugging and abandonment of a well or
- 2265 well field the permittee 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.
- 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 (iii) The owner or operator shall retain the well-plugging report for ten (10)
- 2274 years following site closure.
- 2275

2276 **Section 17. Post-injection Site Care and Site Closure.**

- 2277
- 2278 (a) The owner or operator of a Class VI well must prepare, maintain, update on the
- 2279 same schedule as the update to the area of review delineation, and comply with a plan for post-
- 2280 injection site care and site closure that meets the requirements of paragraph (a)(ii) of this section
- 2281 and is acceptable to the Administrator.
- 2282
- 2283 (i) The owner or operator must submit the post-injection site care and site
- 2284 closure plan as a part of the permit application to be approved by the Administrator, in
- 2285 consultation with EPA.
- 2286

2287 (ii) The post-injection site care and site closure plan must include the
2288 following information:

2289
2290 (A) A demonstration containing substantial evidence that the geologic
2291 sequestration project will no longer pose a risk of endangerment to USDWs or will not harm or
2292 present a risk to human health, safety, or the environment at the end of the post-injection site
2293 care timeframe. The demonstration must be based on significant, site-specific data and
2294 information, including all data and information collected pursuant to Sections 4 and 7 of this
2295 chapter.

2296
2297 (B) The site closure plan shall address all reclamation, required
2298 monitoring, and remediation sufficient to show that the carbon dioxide injected into the geologic
2299 sequestration site will not harm human health, safety, the environment, or drinking water
2300 supplies.

2301
2302 (C) Detailed plans for post-injection monitoring, verification,
2303 maintenance, and mitigation;

2304
2305 (D) The pressure differential between pre-injection and predicted post-
2306 injection pressures in the injection zone;

2307
2308 (E) The predicted position of the carbon dioxide plume and associated
2309 pressure front at the time when plume movement has ceased and pressure differentials sufficient
2310 to cause the movement of injected fluids or formation fluids into a USDW are no longer present,
2311 as demonstrated in the area of review evaluation required under Section 8(c)(i) of this chapter;

2312
2313 (F) A description of post-injection monitoring locations, methods, and
2314 proposed frequency; and

2315
2316 (G) A proposed schedule for submitting post-injection site care
2317 monitoring results pursuant to Section 15(c) of this chapter, as appropriate.

2318
2319 (H) The duration of the post-injection site care timeframe that ensures
2320 compliance with subparagraph (A) of this subsection.

2321
2322 (I) The results of computational modeling performed pursuant to
2323 delineation of the area of review under Section 8 of this chapter;

2324
2325 (J) The predicted timeframe for pressure decline within the injection
2326 zone, and any other zones, such that formation fluids may not be forced into any USDWs; and/or
2327 the timeframe for pressure decline to pre-injection pressures;

2328
2329 (K) The predicted rate of carbon dioxide plume migration within the
2330 injection zone, and the predicted timeframe for the cessation of migration;

2331

2332 (L) A description of the site-specific processes that will result in
2333 carbon dioxide trapping including immobilization by capillary trapping, dissolution, and
2334 mineralization at the site;

2335
2336 (M) The predicted rate of carbon dioxide trapping in the immobile
2337 capillary phase, dissolved phase, and/or mineral phase;

2338
2339 (N) The results of laboratory analyses, research studies, and/or field or
2340 site-specific studies to verify the information required in paragraphs (J) and (K) of this
2341 subsection;

2342
2343 (O) A characterization of the confining zone(s) including a
2344 demonstration that it is free of transmissive faults, fractures, and micro-fractures and of
2345 appropriate thickness, permeability, and integrity to impede fluid (e.g., carbon dioxide, formation
2346 fluids) movement;

2347
2348 (P) The presence of potential conduits for fluid movement including
2349 planned injection wells and project monitoring wells associated with the proposed geologic
2350 sequestration project or any other projects in proximity to the predicted or modeled, final extent
2351 of the carbon dioxide plume and area of elevated pressure;

2352
2353 (Q) A description of the well construction and an assessment of the
2354 quality of plugs of all abandoned wells within the area of review;

2355
2356 (R) The distance between the injection zone and the nearest USDWs
2357 above and/or below the injection zone; and

2358
2359 (S) Any additional site-specific factors required by the Administrator.

2360
2361 (iii) Information submitted to support the demonstration in paragraph (a)(ii) of
2362 this section must meet the following criteria:

2363
2364 (A) All analyses and tests performed to support the demonstration must
2365 be accurate, reproducible, and performed in accordance with the established quality assurance
2366 standards;

2367
2368 (B) Estimation techniques must be appropriate and EPA-certified test
2369 protocols must be used where available;

2370
2371 (C) Predictive models must be appropriate and tailored to the site
2372 conditions, composition of the carbon dioxide stream and injection and site conditions over the
2373 life of the geologic sequestration project;

2374
2375 (D) Predictive models must be calibrated using existing information
2376 (e.g., at Class I, Class II, or Class V experimental technology well sites) where sufficient data are
2377 available;

2378
2379 (E) Reasonably conservative values and modeling assumptions must
2380 be used and disclosed to the Administrator whenever values are estimated on the basis of known,
2381 historical information instead of site-specific measurements;

2382
2383 (F) An analysis must be performed to identify and assess aspects of the
2384 post-injection site care timeframe demonstration that contribute significantly to uncertainty. The
2385 owner or operator must conduct sensitivity analyses to determine the effect that significant
2386 uncertainty may contribute to the modeling demonstration.

2387
2388 (G) An approved quality assurance and quality control plan must
2389 address all aspects of the demonstration; and,

2390
2391 (H) Any additional criteria required by the Administrator.

2392
2393 (iv) Upon cessation of injection, owners or operators of Class VI wells
2394 must either submit an amended post-injection site care and site closure plan or demonstrate to the
2395 Administrator through monitoring data and modeling results that no amendment to the plan is
2396 needed. Any amendments to the post-injection site care and site closure plan must be:

2397
2398 (A) Approved by the Administrator.

2399
2400 (B) Incorporated into the permit.

2401
2402 (C) Subject to the permit modification requirements of Section 4 of
2403 this chapter, as appropriate.

2404
2405 (v) The owner or operator may modify and resubmit the post-injection site
2406 care and site closure plan for the Administrator's approval within thirty (30) days of such
2407 change.

2408
2409 (b) The owner or operator shall monitor the site following the cessation of injection
2410 to show the position of the carbon dioxide plume and pressure front and demonstrate that
2411 USDWs are not being endangered.

2412
2413 (i) The owner or operator shall continue to conduct monitoring as specified in
2414 the Administrator-approved post-injection site care and site closure plan until closure is certified
2415 by the Administrator.

2416
2417 (ii) The owner or operator can request and demonstrate to the satisfaction of
2418 the Administrator that the post-injection site care and site closure plan should be revised to
2419 reduce the frequency of monitoring.

2420
2421 (iii) Prior to authorization for site closure, the owner or operator must
2422 demonstrate to the Administrator, based on monitoring, other site-specific data, and modeling
2423 that is reasonably consistent with site performance, that no additional monitoring is needed to

2424 ensure that the geologic sequestration project does not, and is not expected to pose an
2425 endangerment to a USDW or otherwise threaten human health, safety, or the environment. In
2426 addition, the owner or operator must demonstrate, based on the best available understanding of
2427 the site, including monitoring data and/or modeling, that all other site closure standards and
2428 requirements have been met.

2429

2430 (iv) If such a demonstration cannot be made, the owner or operator must
2431 continue post-injection site care.

2432

2433 (v) The owner or operator must notify the Administrator, in writing, at least
2434 120 days before filing a request for site closure. At this time, if any changes have been made to
2435 the original post-injection site care and site closure plan, the owner or operator must also provide
2436 the revised plan. At the discretion of the Administrator, a shorter notice period may be allowed.

2437

2438 (vi) Post-injection site care shall be for a period of not less than ten (10) years
2439 after the date when all wells excluding monitoring wells have been appropriately plugged and
2440 abandoned, all subsurface operations and activities have ceased and all surface equipment and
2441 improvements have been removed or appropriately abandoned, or so long thereafter as necessary
2442 to obtain a completion and release certificate from the Administrator certifying that plume
2443 stabilization has been achieved without the use of control equipment based on a minimum of
2444 three (3) consecutive years of monitoring data.

2445

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

2449

2450 (d) Once the Administrator has certified site closure, the owner or operator must
2451 submit a site closure report within ninety (90) days after completion of all closure operations.
2452 The report must thereafter be retained at a location designated by the Administrator for ten (10)
2453 years. The report must include:

2454

2455 (i) Documentation of appropriate injection and monitoring well-plugging as
2456 specified in Section 16 of this chapter and paragraph (c) of this section.

2457

2458 (ii) The owner or operator must provide a copy of a survey plat that has been
2459 submitted to the local zoning authority designated by the Administrator.

2460

2461 (A) The plat must indicate the location of the injection well(s) and
2462 monitoring wells relative to permanently surveyed benchmarks.

2463

2464 (B) The owner or operator must also submit a copy of the plat to the
2465 US EPA Regional Administrator.

2466

2467 (iii) Documentation of appropriate notification and information to such State,
2468 local and tribal authorities as have authority over drilling activities to enable such State and local

2469 authorities to impose appropriate conditions on subsequent drilling activities that may penetrate
2470 the injection and confining zone(s).

2471
2472 (iv) Proof of providing notice to surface owners, mineral claimants, mineral
2473 owners, lessees, and other owners of record of subsurface interests as to the proposed site
2474 closure. Notice requirements at a minimum shall include:

2475
2476 (A) The publishing of notice of the application in a newspaper of
2477 general circulation in each county of the proposed operation at weekly intervals for four (4)
2478 consecutive weeks;

2479
2480 (B) The published notice shall provide a mechanism to request a public
2481 hearing;

2482
2483 (C) A copy of the notice shall also be mailed to all surface owners,
2484 mineral claimants, mineral owners, lessees and other owners of record of subsurface interests
2485 that are located within one (1) mile of the proposed boundary of the geologic sequestration site.

2486
2487 (v) Records reflecting the nature, composition and volume of the carbon
2488 dioxide stream.

2489
2490 (e) Each owner or operator of a Class VI injection well must record a notation on the
2491 deed to the facility property or any other document that is normally examined during title search
2492 that will in perpetuity provide any potential purchaser of the property the following information:

2493
2494 (i) The fact that land has been used to sequester carbon dioxide;

2495
2496 (ii) The name of the State agency, local authority, and/or tribe with which the
2497 survey plat was filed, as well as the address of the Regional Environmental Protection Agency
2498 Office to which it was submitted; and

2499
2500 (iii) The volume of fluid injected, the injection zone or zones into which it was
2501 injected, and the period over which injection occurred.

2502
2503 (f) Well-plugging reports, post-injection site care data, including, if appropriate, data
2504 and information used to develop the demonstration of the post-injection site care time frame, and
2505 the site closure report collected pursuant to requirements of subsection (d) above shall be
2506 retained for ten (10) years following site closure. The owner or operator must deliver the records
2507 to the Administrator at the conclusion of the retention period, and the records must thereafter be
2508 retained at a location designated by the Administrator for that purpose.

2509
2510 **Section 18. Emergency and Remedial Response.**

2511
2512 (a) As part of the permit application, the owner or operator must provide the
2513 Administrator with an emergency and remedial response plan that describes actions to be taken
2514 to address movement of the injectate or formation fluids that may cause an endangerment to a

2515 USDW or threaten human health, safety, or the environment during construction, operation,
2516 closure, and post-closure periods.

2517
2518 (i) The emergency and remedial response plan must be reviewed and
2519 updated, as necessary, on the same schedule as the update to the area of review delineation.

2520
2521 (ii) Any amendments to the emergency and remedial response plan must be
2522 approved by the Administrator, must be incorporated into the permit, and are subject to the
2523 permit modification requirements of Section 4 of this chapter, as appropriate.

2524
2525 (A) Amended plans or demonstrations shall be submitted to the
2526 Administrator as follows:

2527
2528 (I) Within one (1) year of an area of review reevaluation;

2529
2530 (II) Following any significant changes to the facility, such as
2531 addition of injection or monitoring wells, on a schedule determined by the Administrator; or

2532
2533 (III) When required by the Administrator.

2534
2535 (b) If monitoring data, or other evidence obtained by the owner or operator indicate
2536 that the injected carbon dioxide stream, displaced formation fluids or associated pressure front
2537 may endanger a USDW or threatens human health, safety, or the environment, the owner or
2538 operator must:

2539
2540 (i) Immediately cease injection;

2541
2542 (ii) Take all steps reasonably necessary to identify and characterize any
2543 release;

2544
2545 (iii) Notify the Administrator within twenty-four (24) hours.

2546
2547 (iv) In addition to paragraphs (i-iii) of this subsection, if an excursion is
2548 discovered, the owner or operator shall provide verbal notice to the Department within twenty-
2549 four (24) hours, followed by written notice to all surface owners, mineral claimants, mineral
2550 owners, lessees and other owners of record of subsurface interests within thirty (30) days of
2551 when the excursion is discovered; and

2552
2553 (v) Implement the emergency and remedial response plan approved by the
2554 Administrator.

2555
2556 (c) The Administrator may allow the operator to resume injection prior to
2557 remediation if the owner or operator demonstrates that the injection operation will not endanger
2558 USDWs or otherwise threaten human health, safety, or the environment.

2559

2560 **Section 19. Financial Responsibility.**

2561
2562 (a) Financial responsibility requirements are to ensure that owners or operators have
2563 the financial resources to carry out activities related to closing and remediating geologic
2564 sequestration sites if needed so they do not endanger the environment or USDWs.

2565
2566 (b) Owners or operators of Class VI wells must demonstrate and maintain financial
2567 responsibility for all applicable phases of the geologic sequestration project including complete
2568 site reclamation in the event of default. The phases of a geologic sequestration project are as
2569 follows:

2570
2571 (i) Permitting/Characterization.

2572
2573 (ii) Monitoring and testing, including the requirements of Section 14 of this
2574 chapter.

2575
2576 (iii) Operations (injection and permanent well closure activities), including the
2577 requirements of Section 16 of this chapter.

2578
2579 (iv) Post-injection site care (“plume stabilization” – monitoring until certified
2580 by the Administrator; above ground reclamation completed), including the requirements of
2581 Section 17 of this chapter.

2582
2583 (v) Emergency and remedial response (that meets the requirements of Section
2584 18 of this chapter).

2585
2586 (c) The owner or operator must submit a detailed written estimate, at the time of
2587 permit application and updated annually in accordance with paragraph (j)(iii) below, in current
2588 dollars, that includes the cost of performing corrective action on wells in the area of review that
2589 meets the requirements of Section 8 of this chapter; plugging the injection well(s) that meets the
2590 requirements of Section 16 of this chapter; post injection site care and site closure that meets the
2591 requirements of Section 17 of this chapter; monitoring activities that meets the requirements of
2592 Section 14 of this chapter; and emergency and remedial response that meets the requirements of
2593 Section 18 of this chapter.

2594
2595 (i) The financial assurance cost estimate for the various phases of the
2596 sequestration project shall consider the following events:

2597
2598 (A) Contamination of underground sources of water including drinking
2599 water supplies.

2600
2601 (B) Mineral rights infringement.

2602
2603 (C) Single large volume release of carbon dioxide that impacts human
2604 health and safety and/or causes ecological damage.

2605
2606 (D) Low level leakage of carbon dioxide to the surface that impacts

2607 human health and safety and/or causes ecological damage.

2608

2609 (E) Storage rights infringement.

2610

2611 (F) Property and infrastructure damage including changes to surface
2612 topography and structures.

2613

2614 (G) Entrained contaminant releases (non-CO2).

2615

2616 (H) Accidents/unplanned events.

2617

2618 (I) Well capping and permitted abandonment.

2619

2620 (J) Removal of above ground facilities and site reclamation.

2621

2622 (ii) The Risk Activity matrix in Appendix A of this chapter shall be
2623 considered during the risk assessment process.

2624

2625 (iii) The cost estimate shall be based upon a multi-disciplinary analytical
2626 framework such as Monte Carlo or other commonly accepted stochastic modeling tools.

2627

2628 (A) Cost curves shall combine risk probabilities, event outcomes, and
2629 damages assessment to calculate expected losses under a series of events.

2630

2631 (B) For all cases of potential damages, the probability distributions
2632 should be identified for 50 percent, 95 percent, and 99 percent probabilities of occurrence.

2633

2634 (d) The owner or operator must also submit a proposed cost estimate for
2635 measurement, monitoring, and verification of plume stabilization following post-closure
2636 certification and release of all other financial assurance instruments.

2637

2638 (e) The cost estimate must be performed for each phase separately and must be based
2639 on the costs to the regulatory agency of hiring a third party to perform the required activities. A
2640 third party is a party who is not within the corporate structure of the owner or operator.

2641

2642 (f) The owner or operator must demonstrate and maintain financial responsibility as
2643 determined by the Administrator that meets the conditions of this section.

2644

2645 (g) The financial responsibility instrument(s) used shall be from the following list of
2646 qualifying instruments:

2647

2648 (i) Trust Funds;

2649

2650 (ii) Surety Bonds;

2651

2652 (iii) Letter of Credit;

2653

- 2654 (iv) Insurance.
- 2655
- 2656 (A) Any insurance instruments submitted for financial assurance
- 2657 purposes shall include State of Wyoming as an additional insured.
- 2658
- 2659 (B) Inclusion of the State of Wyoming as an additional insured shall
- 2660 not be deemed a waiver of sovereign immunity.
- 2661
- 2662 (v) Self-insurance (i.e., Financial Test and Corporate Guarantee);
- 2663
- 2664 (vi) Escrow account;
- 2665
- 2666 (vii) Any other instrument(s) satisfactory to the Administrator.
- 2667
- 2668 (h) The qualifying instrument(s) must be sufficient to cover the cost of the estimate
- 2669 required in subsection (d) of this section.
- 2670
- 2671 (i) The qualifying financial responsibility instrument(s) must comprise protective
- 2672 conditions of coverage that include at a minimum cancellation, renewal, continuation provisions,
- 2673 specifications on when the provider becomes liable following a notice of cancellation, and
- 2674 requirements for the provider to meet a minimum rating, minimum capitalization, and the ability
- 2675 to pass the bond rating test when applicable.
- 2676
- 2677 (i) Cancellation – An owner or operator must provide that their financial
- 2678 mechanism may not cancel, terminate or fail to renew except for failure to pay such financial
- 2679 instrument. If there is a failure to pay the financial instrument, the financial institution may elect
- 2680 to cancel, terminate, or fail to renew the instrument by sending notice by certified mail to the
- 2681 owner or operator and the Administrator. The cancellation must not be final for 120 days after
- 2682 receipt of cancellation notice. The owner or operator must provide an alternate financial
- 2683 responsibility demonstration within sixty (60) days of notice of cancellation, and if an alternate
- 2684 financial responsibility demonstration is not acceptable (or possible), any funds from the
- 2685 instrument being cancelled must be released within sixty (60) days of notification by the
- 2686 Administrator.
- 2687
- 2688 (ii) Renewal – Owners or operators must renew all financial instruments, if an
- 2689 instrument expires, for the entire term of the geologic sequestration project. The instrument may
- 2690 be automatically renewed as long as, at a minimum, the owner or operator has the option of
- 2691 renewal at the face amount of the expiring instrument.
- 2692
- 2693 (iii) Continuation – Cancellation, termination, or failure to renew may not
- 2694 occur and the financial instrument shall remain in full force and effect in the event that on or
- 2695 before the date of expiration:
- 2696
- 2697 (A) The Administrator deems the facility abandoned.
- 2698
- 2699 (B) The permit is terminated, revoked, or a new permit is denied.
- 2700

2701 (C) Closure is ordered by the Administrator, a U.S. district court, or
2702 other court of competent jurisdiction.

2703
2704 (D) The owner or operator is named as debtor in a voluntary or
2705 involuntary proceeding under Title 11 (Bankruptcy), U.S. Code.

2706
2707 (E) The amount due is paid.

2708
2709 (j) The qualifying financial responsibility instrument(s) must be approved by the
2710 Administrator. The Administrator shall also approve the use and length of pay-in-periods for
2711 trust funds and escrow accounts.

2712
2713 (i) The Administrator shall consider and approve the financial responsibility
2714 demonstration for all the phases of the geologic sequestration project prior to issuing a Class VI
2715 permit.

2716
2717 (ii) The Administrator may find that the financial responsibility demonstration
2718 is unsatisfactory for any reason, as long as that reason is not arbitrary or capricious. The
2719 Administrator may exercise discretion in negotiating a satisfactory financial responsibility
2720 demonstration or to deny a demonstration.

2721
2722 (iii) The owner or operator must provide any updated information related to
2723 their financial responsibility instrument(s) on an annual basis and if there are any changes, the
2724 Administrator must evaluate the financial responsibility demonstration to confirm that the
2725 instrument(s) used remain adequate for use. The owner or operator must maintain financial
2726 responsibility requirements regardless of the status of the Administrator's review of the financial
2727 responsibility demonstration.

2728
2729 (iv) The owner or operator must provide an adjustment of the cost estimate to
2730 the Administrator within sixty (60) days of notification by the Administrator, if the
2731 Administrator determines during the annual evaluation of the qualifying financial responsibility
2732 instrument(s) that the most recent demonstration is no longer adequate to cover the cost of
2733 corrective action (as required by Section 8 of this chapter), injection well-plugging (as required
2734 by Section 16 of this chapter), post-injection site care and site closure (as required by Section 17
2735 of this chapter), and emergency and remedial response (as required by Section 18 of this
2736 chapter).

2737
2738 (v) During the active life of the geologic sequestration project, the owner or
2739 operator must adjust the cost estimate for inflation within sixty (60) days prior to the anniversary
2740 date of the establishment of the financial instrument(s) used to comply with paragraph (g) of this
2741 section and provide this adjustment to the Administrator. The owner or operator must also
2742 provide to the Administrator written updates of adjustments to the cost estimate within sixty (60)
2743 days of any amendments to the area of review and corrective action plan (Section 8 of this
2744 chapter), the injection well-plugging plan (Section 16 of this chapter), the post-injection site care
2745 and site closure plan (Section 17 of this chapter), the emergency and remedial response plan

2746 (Section 18 of this chapter), and mitigation or reclamation costs that State may incur as a result
2747 of any default by the permit holder.

2748
2749 (vi) The Administrator must approve any decrease or increase to the initial
2750 cost estimate. During the active life of the geologic sequestration project, the owner or operator
2751 must revise the cost estimate no later than sixty (60) days after the Administrator has approved
2752 the request to modify the area of review and corrective action plan (Section 8 of this chapter), the
2753 injection well-plugging plan (Section 16 of this chapter), the post-injection site care and site
2754 closure plan (Section 17 of this chapter), and the emergency and response plan (Section 18 of
2755 this chapter), if the change in the plan increases the cost. If the change to the plans decreases the
2756 cost, any withdrawal of funds must be approved by the Administrator. Any decrease to the value
2757 of the financial assurance instrument must first be approved by the Administrator. The revised
2758 cost estimate must be adjusted for inflation as specified in paragraph (k)(v) of this section.

2759
2760 (vii) Whenever the current cost estimate increases to an amount greater than the
2761 face amount of a financial instrument currently in use, the owner or operator, within sixty (60)
2762 days after the increase, must either cause the face amount to be increased to an amount at least
2763 equal to the current cost estimate and submit evidence of such increase to the Administrator, or
2764 obtain other financial responsibility instruments to cover the increase. Whenever the current cost
2765 estimate decreases, the face amount of the financial assurance instrument may be reduced to the
2766 amount of the current cost estimate only after the owner or operator has received written
2767 approval from the Administrator.

2768
2769 (k) The owner or operator may demonstrate financial responsibility by using one (1)
2770 or multiple qualifying financial instruments for specific phases of the geologic sequestration
2771 project.

2772
2773 (i) In the event that the owner or operator combines more than one (1)
2774 instrument for a specific geologic sequestration phase (e.g., well-plugging), such combination
2775 must be limited to instruments that are not based on financial strength or performance (i.e., self-
2776 insurance or performance bond). For example trust funds, surety bonds guaranteeing payment
2777 into a trust fund, letters of credit, escrow account, and insurance.

2778
2779 (ii) When using a third-party instrument to demonstrate financial
2780 responsibility, the owner or operator must provide proof that the third-party providers either have
2781 passed financial strength requirements based on credit ratings; or has met a minimum rating,
2782 minimum capitalization, and ability to pass the bond rating test when applicable.

2783
2784 (iii) An owner or operator using certain types of third-party instruments must
2785 establish a standby trust to enable the State of Wyoming to be party to the financial responsibility
2786 agreement without the State of Wyoming being the beneficiary of any funds. The standby trust
2787 fund must be used along with other financial responsibility instruments (e.g., surety bonds,
2788 letters of credit, or escrow accounts) to provide a location to place funds if needed.

2789
2790 (iv) An owner or operator may deposit money into an escrow account to cover
2791 financial responsibility requirements; this account must segregate funds sufficient to cover

2792 estimated costs for Class VI (geologic sequestration) financial responsibility from other accounts
2793 and uses.

2794
2795 (v) An owner or operator or its guarantor may use self-insurance to
2796 demonstrate financial responsibility for certain phases of geologic sequestration projects. In
2797 order to satisfy this requirement the owner or operator must meet a tangible net worth of an
2798 amount approved by the Administrator, have a net working capital and tangible net worth each at
2799 least six times the sum of the current well-plugging, post injection site care and site closure cost,
2800 have assets located in the United States amounting to at least 90 percent of total assets or at least
2801 six (6) times the sum of the current well-plugging, post injection site care and site closure cost,
2802 and must submit a report of its bond rating and financial information annually. In addition the
2803 owner or operator must either: have a bond rating test of AAA, AA, A, or BBB as issued by
2804 Standard & Poor's or Aaa, Aa, A, or Baa as issued by Moody's; or meet all of the following five
2805 financial ratio thresholds: a ratio of total liabilities to net worth less than 2.0; a ratio of current
2806 assets to current liabilities greater than 1.5; a ratio of the sum of net income plus depreciation,
2807 depletion, and amortization to total liabilities greater than 0.1; a ratio of current assets minus
2808 current liabilities to total assets greater than -0.1; and a net profit (revenues minus expenses)
2809 greater than 0.

2810
2811 (vi) An owner or operator who is not able to meet corporate financial test
2812 criteria may arrange a corporate guarantee by demonstrating that its corporate parent meets the
2813 financial test requirements on its behalf. The parent's demonstration that it meets the financial
2814 test requirement is insufficient if it has not also guaranteed to fulfill the obligations for the owner
2815 or operator.

2816
2817 (vii) An owner or operator may obtain an insurance policy to cover the
2818 estimated costs of geologic sequestration activities requiring financial responsibility. This
2819 insurance policy must be obtained from a third party provider.

2820
2821 (l) The owner or operator must maintain financial responsibility and resources until
2822 the administrator receives and approves the completed post-injection site care and site closure
2823 plan and the administrator approves site closure.

2824
2825 (m) The owner or operator must notify the Administrator by certified mail of adverse
2826 financial conditions such as bankruptcy that may affect the ability to carry out injection well-
2827 plugging and post-injection site care and site closure.

2828
2829 (i) In the event that the owner or operator or the third party provider of a
2830 financial responsibility instrument is going through a bankruptcy, the owner or operator must
2831 notify the Administrator by certified mail of the commencement of a voluntary or involuntary
2832 proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor,
2833 within ten (10) days after commencement of the proceeding.

2834
2835 (ii) A guarantor of a corporate guarantee must make such a notification to the
2836 Administrator if he/she is named as debtor, as required under the terms of the corporate
2837 guarantee.

2838
2839 (iii) An owner or operator who fulfills the requirements of paragraph (g) of this
2840 section by obtaining a trust fund, surety bond, letter of credit, escrow account, or insurance
2841 policy will be deemed to be without the required financial assurance in the event of bankruptcy
2842 of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee
2843 institution to act as trustee of the institution issuing the trust fund, surety bond, letter of credit,
2844 escrow account, or insurance policy. The owner or operator must establish other financial
2845 assurance within sixty (60) days after such an event.

2846
2847 (n) The owner or operator may be released from a financial instrument in the
2848 following circumstances:

2849
2850 (i) The owner or operator has completed the phase of the geologic
2851 sequestration project for which the financial instrument was required and has fulfilled all its
2852 financial obligations as determined by the Administrator, including obtaining financial
2853 responsibility for the next phase of the geologic sequestration project, if required.

2854
2855 (ii) The owner or operator has submitted a replacement financial instrument
2856 and received written approval from the Administrator accepting the new financial instrument and
2857 releasing the owner or operator from the previous financial instrument.

2858
2859 (iii) The owner or operator has submitted a revised cost estimate for the
2860 remaining phases of the geologic sequestration project. The revised cost estimate may
2861 demonstrate that a partial release of the financial instrument is warranted and can still provide
2862 adequate financial assurance for the remainder of the project. Partial release of the financial
2863 instrument is at the discretion of the Administrator.

2864
2865 (o) Following the release of all financial assurance and receipt of a site closure
2866 certificate, the Administrator must approve the cost estimate prepared for the post-closure
2867 measurement, monitoring and verification of a geologic sequestration site. The cost estimate
2868 shall only be provided after plume stabilization and all remediation work has been completed.

2869
2870 **Section 20. Public Participation, Public Notice and Public Hearing Requirements.**

2871
2872 (a) The Administrator shall give public notice if a draft permit has been prepared or a
2873 hearing has been scheduled.

2874
2875 (b) Public notice of the preparation of a draft permit shall allow at least sixty (60)
2876 days for public comment. Public notice of a public hearing shall be given at least thirty (30) days
2877 before the hearing. Public notice of the hearing may be given at the same time as public notice of
2878 the draft permit and the two notices may be combined.

2879
2880 (c) Public notice shall be given by:

2881
2882 (i) Mailing a copy of the notice, a copy of the fact sheet, the permit
2883 application (if any) and the draft permit (if any) to the following persons:

- 2884
2885 (A) The applicant, by certified or registered mail;
2886
2887 (B) The U.S. Environmental Protection Agency, Region 8 Drinking
2888 Water Program;
2889
2890 (C) The U.S. Environmental Protection Agency, Underground
2891 Injection Control Program;
2892
2893 (D) Wyoming Game and Fish Department;
2894
2895 (E) Wyoming State Engineer;
2896
2897 (F) State Historical Preservation Officer;
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2899 (G) Wyoming Oil and Gas Conservation Commission;
2900
2901 (H) Wyoming Department of Environmental Quality, Land Quality
2902 Division
2903 (I) Wyoming State Geological Survey;
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2905 (J) Wyoming Water Development Office;
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2907 (K) Wyoming Department of Environmental Quality, Air Quality
2908 Division;
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2910 (L) Wyoming Department of Environmental Quality, Solid and
2911 Hazardous Waste Division; and
2912
2913 (M) U.S. Army Corps of Engineers;
2914
2915 (N) Persons on the mailing list developed by the Department, including
2916 those who request in writing to be on the list and by soliciting participants in public hearings in
2917 that area for their interest in being included on “area” mailing lists; and
2918
2919 (O) Any unit of local government having jurisdiction over the area
2920 where the facility is proposed to be located.
2921
2922 (ii) Publication of the notice in a newspaper of general circulation in the
2923 location of the facility or operation; and
2924
2925 (iii) At the discretion of the Administrator, any other method reasonably
2926 expected to give actual notice of the action in question to the persons potentially affected by it,
2927 including press releases or any other forum or medium to elicit public participation.
2928

2929 (d) All public notices issued under this chapter shall contain the following minimum
2930 information:

- 2931
- 2932 (i) Name and address of the Department;
- 2933
- 2934 (ii) Name and address of permittee or permit applicant, and, if different, of the
2935 facility or activity regulated by the permit;
- 2936
- 2937 (iii) A brief description of the business conducted at the facility or activity
2938 described in the permit application or the draft permit;
- 2939
- 2940 (iv) The type and quantity of wastes, fluids, or pollutants that are proposed to
2941 be or are being treated, stored, disposed of, injected, emitted, or discharged.
- 2942
- 2943 (v) A brief summary of the basis for the draft permit conditions including
2944 references to applicable statutory or regulatory provisions;
- 2945
- 2946 (vi) Reasons why any requested variances or alternatives to required standards
2947 do or do not appear justified;
- 2948
- 2949 (vii) Name, address and telephone number of a person from whom interested
2950 persons may obtain further information, including copies of the draft permit, as the case may be,
2951 statement of basis or fact sheet, and the application;
- 2952
- 2953 (viii) A brief description of comment procedures including,
2954
 - 2955 (A) Procedures to request a hearing;
 - 2956
 - 2957 (B) The beginning and ending dates of the comment period;
 - 2958
 - 2959 (C) The address where comments will be received; and
 - 2960
 - 2961 (D) Other procedures that the public may use to participate in the final
2962 permit decision; and
 - 2963
 - 2964 (ix) Any additional information considered necessary and proper.
 - 2965

2966 (e) In addition to the information required in paragraph (d) of this section, any notice
2967 for public hearing shall contain the following:

- 2968
- 2969 (i) Reference to the date of previous public notices relating to the permit;
- 2970
- 2971 (ii) Date, time and place of hearing; and
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- 2973 (iii) A brief description of the nature and purpose of the hearing, including
2974 applicable rules and procedures.

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(f) The Department shall provide an opportunity for the applicant, permittee, or any interested person to submit written comments regarding any aspect of a permit or to request a public hearing.

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

(h) The Administrator shall hold a hearing whenever the Administrator finds, on the basis of requests, a significant degree of public interest in a draft permit. The Administrator has the discretion to hold a hearing whenever such a hearing may clarify issues involved in a permit decision.

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

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

(k) At the time a final decision is issued, the Department shall respond, in writing, to those comments received during the public comment period or comments received during the allotted time for a hearing held by the Department. This response shall:

(i) Specify any changes that have been made to the permit; and

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

(l) The response to comments shall also be available to the public.

(m) Requests for a contested case hearing on a permit issuance, denial, revocation, termination, or any other final Department action appealable to the Council shall be in accordance with the Department of Environmental Quality Rules of Practice and Procedure.

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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 CO₂ 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 CO₂ 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).

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3016**Risk Activity Table (continued)**

	Major Risk (Feature, Event, or Process)
5	Storage Rights Infringement (CO₂ 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-CO₂) 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.

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