Enclosure 3

Department of Energy Response 7

CRA-2019 Status Report of DOE

Responses to EPA Completeness

Comments

Status Report of DOE Responses to EPA Completeness

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC1-GEN-1	Request for update on currently projected facility life span and closure date. Explain and reconcile different closure dates found in available compliance documents.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-24-1a	Waste Characterization Documentation Inconcistencies or Errors - the status of the WIPP Waste Information System (WWIS) is inconcistent with WDS User's Manual	3/23/2020	Response Letter 1 (6/11/2020)
CC1-24-1b	Waste Characterization Documentation - The Revision 17 (USDOE, 2018b) should be updated to Revision 19 (USDOE, 2019)	3/23/2020	Response Letter 1 (6/11/2020)
CC1-27-1	Peer Review Reference Request	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-1a	Inconsistency in correlating the six borehole plug configuration types with the three plugging patterns used in PA.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-1b	Typographical error in table PA-14.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-2a	Borehole Plugging Requirements Completeness Request - Request for Maps of the Known Potash Leasing Area (KPLA).	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-2b	Borehole Plugging Requirements Completeness Request - Request for a summary of the curreng plugging requirements for abandoned boreholes within New Mexico portion of Delaware Basin, outside KPLA.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-2c	Borehole Plugging Requirements Completeness Request - Request for copies of the borehole abandomnment and plugging regulations for boreholes within New Mexico portion of Delaware Basin, outside KPLA.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-2d	Borehole Plugging Requirements Completeness RequestRequest for a summary of the current plugging patterns employed to meet those regulations.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-33-3a	Completeness Request for Borehole Plugging Database - Please provide the number of plugged boreholes within the KPLA that were also within the Delaware Basin.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-33-3b	Completeness Request for Borehole Plugging Database -Please provide the number of plugged boreholes within the KPLA that were outside the Delaware Basin.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-33-3c	Completeness Request for Borehole Plugging Database -The number of plugged boreholes near the Delaware Basin boundary where it is not clear whether they are inside our outside that boundary.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-33-3d	Completeness Request for Borehole Plugging Database -Please provide the numbers of wells of each plugging pattern type and the plugging pattern frequencies that would have been determined if the data collection and analysis methods used in the CRA-2014 PA had also been used in the CRA-2019 PA.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-1a	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF: - Overall means of WP Pressure.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-1b	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF: Overall means of SROR Pressure.	3/23/2020	Response Letter 1 (6/11/2020)

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CC1-34-1c	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF:Overall means of NROR Pressure.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-1d	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF: Overall means of WP Brine Saturation.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-1e	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF:Overall means of SROR Brine Saturation.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-1f	Results of Performance Assessments - Request for figures. Please provide the following figures for Scenarios S3-BF:Overall means of NROR Brine Saturation	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-2a	Request for figures showing the pressure and brine saturation vs time for the example realization for Scenarios S2-BF and S3-BF for the WP, SROR, and NROR.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2b	Request for the repository pressure and brine saturation encountered by a first E1 borehole penetrating the WP at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2c	Request for the repository pressure and brine saturation encountered bya second borehole penetrating the WP at 500 years post-closure following a first E1 borehole penetrating the WP at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2d	Request for the repository pressure and brine saturation encountered by a second borehole penetrating the WP at 2,000 years post-closure following a first E1 borehole penetrating the WP at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2e	Request for the repository pressure and brine saturation encountered by a second borehole penetrating Panel 1 at 500 years post-closure following a first E1 borehole penetrating Panel 6 at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2f	Request for the repository pressure and brine saturation encountered by a second borehole penetrating Panel 1 at 2,000 years post-closure following a first E1 borehole penetrating Panel 6 at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-2g	Request for the repository pressure and brine saturation encountered by a thrid borehole penetrating Panel 3 at 3,000 years post-closure following a second borehole penetrating Panel 5 at 2,000 years post-closure following a first E1 borehole penetrating Panel 6 at 200 years post-closure.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-3a	Frequency of Borehole Intrusions Completness RequestGraphical and tabular displays of the number of first E1 borehole intrusions in 20-year increments for the first 500 years following repository closure for Replicate 1.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-3b	Frequency of Borehole Intrusions Completness RequestGraphical and tabular displays of the number of second E1 borehole intrusions in 20-year increments for the first 500 years following repository closure for Replicate 1.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-3c	Frequency of Borehole Intrusions Completness RequestGraphical and tabular displays of the number of second E1 borehole intrusions in 200-year increments for the 10,000 year regulatory period for Replicate 1.	3/23/2020	Response Letter 3 (8/13/2020)

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CC1-34-3d	Frequency of Borehole Intrusions Completness RequestGraphical and tabular displays of the number of second E1 borehole intrusions in 200-year increments over the 10,000-year regulatory period for Replicate 1.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-3e	Frequency of Borehole Intrusions Completness RequestGraphical and tabular displays of the total number of waste area borehole intrusions per 10,000-year realization for Replicate 1.	3/23/2020	Response Letter 3 (8/13/2020)
CC1-34-4	Panel Closure Designs Completeness Request. Please provide as-built descriptions and illustrations of the ROM salt and bulkhead components for each of the four panel closure systems installed between Panels 9 and 10.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-5	Panel Closure Designs and Construction Completeness Request. Please provide descriptions and illustrations of the panel closure systems planned to be installed at each of the access drifts to Panels 1, 2, 7, and 8 or identify whether the existing closure design (e.g., 100 feet of run-of-mine salt) will be used.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-6	Results of Salt Rock Mechanics Studies Updates Requested.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-34-7a	Corrections to Relative Permeability Models - Please provide the three relative permeability issues identified by Day (2018, ERMS 570325, P.1)	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-7b	Corrections to Relative Permeability Models - Please explain why the errors that affected model KRP=2 did not also affect other models.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-7c	Corrections to Relative Permeability Models- All relative models except KRP=3,4,11, and 12 were reviewed and found to have errors. Were these four models also reviewed for errors?	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-7d	Corrections to Relative Permeability Models - For each of the relative permeability models affected by the errors identified in Day (2018, ERMS 570325), please identify and describe the materials used in PAs that were assigned to those models.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-7e	Corrections to Relative Permeability Models- For each of the materials and each of the PAs identified in response to Question 34-7d, please provide the values assigned to properties PCT_A, PCT_EXP, and KCP.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-34-8	BRAGFLO representation of shafts and concrete monolith plug	3/23/2020	Response Letter 2 (7/9/2020)
CC1-42-1	Monitoring Question regarding changes in CRA-2019 DPA and MONPAR analysis	3/23/2020	Response Letter 2 (7/9/2020)
CC1-43-1	Passive Institutional Controls Clarification on typographical error	3/23/2020	Response Letter 1 (6/11/2020)
CC1-46-1	Removal of Waste Appendix WRAC missing/not available	3/23/2020	Response Letter 1 (6/11/2020)
CC1-51/52-1	Consideration of Protected Individual and Exposure Pathways - Please provide calculations, figures, tables, and/or explanations which reflect the changes in CRA-2019 for the compliances of individual and groundwater protection requirements.	3/23/2020	Response Letter 2 (7/9/2020)

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CC1-PA-1	Appendix PA: Missing or mislabeled references - Missing reference: WIPP PA 2010 ERMS 554044 is missing. WIPP PA 2010 ERMS 554044 was listed as a reference in Zeitler 2019 ERMS 571150, WIPP PA 2010 ERMS 554046, and Brunell 2019 ERMS 571373. However, it is not included in the DPA-2019 reference folders. Please provide the document. It appears the reference is the requirements document for CCDFGF (Version 7.0).	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-1a	Modify Cut-Off Date for Actinide Solubility Uncertainty Evaluation - Please identify all additional published +III and +IV experimental solubility data appropriate for inclusion in the uncertainty distributions using a Criterion G1 cutoff date of December 2018 and the other criteria established for selection of experimental solubility data (EPA 2017).	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-1b	"Modify Cut-Off Date for Actinide Solubility Uncertainty Evaluation - If additional actinide solubility data are identified that meet the criteria, please calculate the difference values (log D) for each solubility value and provide revised uncertainty distributions for the solubilities of the +III and +IV actinides that include these additional data. DOE should also provide an assessment of the effects of the revised actinide solubility uncertainty distributions on PA result"	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-1c	"Modify Cut-Off Date for Actinide Solubility Uncertainty Evaluation - Please provide all EQ3/6 input and output files and Excel spreadsheets used to calculate the +III and +IV actinide solubility uncertainty distributions, ensuring that the log D values calculated for each experimental solubility data point are clearly identified."	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-2	Inaccurate Statement Regarding Sampling of Parameter BIOGENFC. Please confirm that the paramater WAS_AREA:BIOGENFC was sampled for the CRA-2019 PA.	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-3	"Inaccurate Statement Regarding Sampling of MgO Hydration Rate Parameters. Please confirm that the parameters WAS_AREA:BRUCITEC, WAS_AREA:BRUCITEH, and WAS_AREA:BRUCITES were sampled for the CRA-2019 PA."	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-4	Typographical Error in Appendix GEOCHEM - When discussing the process models for the dissolved actinide source term, the dissolved +IV actinide model is listed twice and the +VI actinide model is not listed on page GEOCHEM-100, line 32 (Section GEOCHEM-4.4.2).	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-5	Typographical error in Appendix GEOCHEM on page GEOCHEM-101 line 23. An(IV) is used instead of An(III) on page GEOCHEM-100, line 23 during a discussion of the process model uncertainty for dissolved An(III) (Section GEOCHEM4.4.2.1).	3/23/2020	Response Letter 1 (6/11/2020)
CC1-GEOCHEM-6	Missing discussion of conceptual model uncertainty for dissolved An(III)	3/23/2020	Response Letter 1 (6/11/2020)
CC1-SOTERM-1	Document Request from Van Soest (2018)	3/23/2020	Response Letter 1 (6/11/2020)
CC1-SOTERM-2	Incomplete Evaluation of Borate Aqueous Speciation Solubility Data	3/23/2020	Response Letter 6 10/26/2020
CC1-SOTERM-3	Incomplete Evaluation of Am(III) Aqueous Speciation and Solubility Data	3/23/2020	Pending

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CC1-SOTERM-4	Incomplete Evaluation of Th(IV) Aqueous Speciation and Solubility Data	3/23/2020	Response Letter 6 10/26/2020
CC1-SOTERM-5	Incomplete Iron Inventory Data in table SOTERM-3	3/23/2020	Response Letter 1 (6/11/2020)
CC1-MASS-1	Definition of Conservative - Please explain why the definition of "conservative" has fundamentally changed from previous CRA's.	3/23/2020	Response Letter 2 (7/9/2020)
CC1-MASS-2	Identification of conservative assumptions leading to lower releases.	3/23/2020	Response Letter 2 (7/9/2020)
CC2-GEN-2	Cutoff Dates - How do the data cutoff dates used for DPA-2019 affect the compliance conclusions presented in the CRA-2019? For example, ATWIR-2017 has a data cutoff date of 12/31/2016 and was used to present the waste characteristics data in Section 24. However, the ATWIR used to make the PAIR for the DPA uses ATWIR-2018, with a data cutoff date of 12/31/2017 and the data from this document is used to generate scaled waste values and other data related to Section 24. Please provide a separate explanation with supporting rationale for each occurrence	5/6/2020	Response Letter 3 (8/13/2020)
CC2-22-1	(Quality Assurance) QA Audits - Please provide a listing of QA audits for 2014-2019 performed by EPA that took place at WIPP, CBFO, and waste generator sites during the time of recertification in a table, similar in format to the following example:	5/6/2020	Response Letter 3 (8/13/2020)
CC2-24-2a	(Waste Characterization) Table updates - Please update Tables 24-2, 24-3, 24-4, 24-5, and 24-6 to reflect the ATWIR-2018, rather than the ATWIR-2017 since ATWIR-2018 is the version used for the DPA submission.	5/6/2020	Response Letter 4 (9/15/2020)
CC2-24-2b	(Waste Characterization) Table updates - Enclosure 2 of Sosson (2019) provides a list of waste characteristics being examined for the PA (as required by 40 CFR 194.24(b)(1)) that is incomplete. Please update the list to include colloidal suspensions, waste compactability, and any new characteristics that have been used for the PA. Additionally, please include references to where these characteristics have been addressed.	5/6/2020	Response Letter 4 (9/15/2020)
CC2-24-2c (numbered CC2-24-1 in EPA Letter: a duplicate)	(Waste Characterization) Table updates - Please provide an updated table of waste characteristics and components that are excluded from consideration in the PA as required by 40 CFR 194.24(b)(3). The list currently referenced is Table WCA-4 of Appendix-WCA of the CCA which is currently outdated as it includes brine radiolysis and organic ligands which are now included in PA.	5/6/2020	Response Letter 4 (9/15/2020)
CC2-34-9	Borehole Drilling Conceptual Model Clarification - clarify whether the conceptual model for E2 boreholes that may intersect the waste area continues to assume they are drilled in a search for natural resources below the repository horizon and are not assumed to terminate at the floor of the Waste Panel. If this conceptual model has not changed, please clarify the description of Scenario S4-BF in Day (2019, ERMS 571368, p. 36) and other similar scenarios regarding borehole termination.	5/6/2020	Response Letter 3 (8/13/2020)

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CC2-34-10	Clarification of "Neighbor" Relationships in the CRA19_CL Analysis - provide 1) the criteria used to establish the "neighbor" relationships used in the CRA19_CL analysis, and 2) a table similar to Table 2-5 in ERMS 568459, listing the same, adjacent, and non-adjacent waste panel "neighbors" used in that analysis.	5/6/2020	Response Letter 3 (8/13/2020)
CC2-34-11	Results of Granular Salt Reconsolidation Study - provide an update describing the current status of Experimental Investigation TP-17-04: Microstructural Investigations on Natural and Laboratory Tested Salt, the study findings and conclusions to date, and a schedule of its completion. Provide special emphasis on what has been learned about the extent and timing of salt reconsolidation to native salt porosity and permeability from the microstructural investigations and the study of natural and anthropogenic analogues.	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-7	Missing Reference - Xiong, Y.-L. 2018. Experimental determination of solubilities of lead oxalate (PbC2O4), di-calcium ethylenediaminetetraacetic acid hydrate (Ca2EDTA•7H2O(s)) in MgC12-H2O system, and earlandite (Ca3[C3H5O(COO)3]2•4H2O) in NaCl-H2O and MgC12-H2O systems, and their respective Pitzer interaction parameters, Revision 3, Supersedes ERMS 567810. Carlsbad, NM: Sandia National Laboratories. ERMS 570088. T	5/6/2020	Response Letter 3 (8/13/2020)
CC2-GEOCHEM-8a	Clarification of Data Source Information in Domski (2019) - Were the Na – Ca – Cl – EDTA system data obtained from Table 4 of Xiong (2018), as stated by Domski (2018)?	5/6/2020	Response Letter 6 10/26/2020
CC2-GEOCHEM-8b	Clarification of Data Source Information in Domski (2019) - Please identify the source of the Na – Mg – Cl – Oxalate system data.	5/6/2020	Response Letter 6 10/26/2020
CC2-GEOCHEM-8c	Clarification of Data Source Information in Domski (2019) - Please identify the source of the Na – Fe – Cl – CO3 system data.	5/6/2020	Response Letter 6 10/26/2020
CC2-GEOCHEM-9	Typographical Errors in Table GEOCHEM-21 - In Table SOTERM- 21, please note that the charges assigned to some constituents in the following reactions should be corrected: MgHEDTA2- ↔ H+ + MgEDTA4- should be MgHEDTA- ↔ H+ + MgEDTA2- MgHEDTA2- ↔ H+ + Mg2+ + EDTA4- should be MgHEDTA- ↔ H+ + Mg2+ + EDTA4- CaHEDTA2- ↔ H+ + CaEDTA2- should be CaHEDTA- ↔ H+ + CaEDTA2- CaHEDTA2- ↔ H+ + Ca2+ + EDTA4-should be CaHEDTA- ↔ H+ + Ca2+ + EDTA4-	5/6/2020	Response Letter 3 (8/13/2020)
CC2-GEOCHEM-10a	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters Please provide a comparison of the apparent stability constants as a function of ionic strength: Acid dissociation reaction H4EDTA(aq) ↔ H+ + H3EDTA–	5/6/2020	Response Letter 4 (9/15/2020)

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CC2-GEOCHEM-10b	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction ParametersPlease provide a comparison of the apparent stability constants as a function of ionic strength: Acid dissociation reaction H3EDTA- ↔ H+ + H2EDTA2–	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-10c	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters Please provide a comparison of the apparent stability constants as a function of ionic strength: Acid dissociation reaction H2EDTA- ↔ H+ + HEDTA3–	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-10d	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters - provide a comparison of the apparent stability constants as a function of ionic strength: Acid dissociation reaction HEDTA- ↔ H+ + EDTA4–	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-10e	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters - provide a comparison of the apparent stability constants as a function of ionic strength: Thorium complexation with EDTA	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-10f	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters - provide a comparison of the apparent stability constants as a function of ionic strength:Americium complexation with EDTA	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-10g	Testing of Revised EDTA Stability Constants and Pitzer Ion-interaction Parameters - provide a comparison of the apparent stability constants as a function of ionic strength: Magnesium complexation with EDTA	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-11a	Data Used to Derive Ca2EDTA·7H2O(s) Solubility Product and Evaluation of the Solubility Product - explain whether the data Domski (2018) used to develop the solubility product for Ca2EDTA·7H2O(s) and β(0) and β(1) Pitzer parameters for Na+ / CaEDTA2- were from Table 4 of Xiong et al. (2018), and if the EDTA concentrations were assumed equal to half of the measured calcium concentrations.	5/6/2020	Response Letter 3 (8/13/2020)
CC2-GEOCHEM-11b	Data Used to Derive Ca2EDTA·7H2O(s) Solubility Product and Evaluation of the Solubility Product. Please use the data in Kirkes et al. (2014, Table 3-57) including pmH data calculated from the reported pH measurements, to calculate apparent log Ksp values as a function of ionic strength for Ca2EDTA·7H2O(s) in NaCl solutions. Please compare these measured apparent log Ksp values to apparent log Ksp values calculated using the DATA0.FM4 database.	5/6/2020	Response Letter 5 10/19/2020
CC2-GEOCHEM-11c	Data Used to Derive Ca2EDTA·7H2O(s) Solubility Product and Evaluation of the Solubility Product. Please use the data in Kirkes et al. (2014, Table 3-59) including pmH data calculated from the reported pH measurements, to calculate apparent log Ksp values as a function of ionic strength for Ca2EDTA·7H2O(s) in MgCl2 solutions. Please compare these measured apparent log Ksp values to apparent log Ksp values calculated using the DATA0.FM4 database	5/6/2020	Response Letter 5 10/19/2020
CC2-GEOCHEM-12a	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Acid dissociation reaction H3Citrate(aq) ↔ H+ + H2Citrate-	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-12b	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Acid dissociation reaction H2Citrate- ↔ H+ + HCitrate2-	5/6/2020	Response Letter 4 (9/15/2020)

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CC2-GEOCHEM-12c	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Acid dissociation reaction HCitrate2- ↔ H+ + Citrate3-	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-12d	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Thorium complexation with citrate	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-12e	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Americium complexation with citrate	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-12f	Evaluation of Revised Citrate Equilibrium Constants. Please provide as a function of ionic strength a comparison of the apparent stability constants: Magnesium complexation with citrate	5/6/2020	Response Letter 4 (9/15/2020)
CC2-GEOCHEM-13	Omission of Earlandite from DATA0.FM4. Please note that although the log Ksp for earlandite [Ca3(Citrate)2·4H2O(s)] is included in Table GEOCHEM-22, the solubility reaction for earlandite was not included in DATA0.FM4.	5/6/2020	Response Letter 6 10/26/2020
CC2-GEOCHEM-14	Supporting Files for Actinide Solubility Calculations - Please provide copies of the following Excel files cited by Domski and Sisk-Scott (2019): Conc_density_calcs_CRA-2019_PA.slsx AP-153_Scaling of Solids_2019.xlsx	5/6/2020	Response Letter 3 (8/13/2020)
CC2-GEOCHEM-15	Effects of Selected G Value for H2(g) Production by Brine Radiolysis. Please provide justification for selecting a single G value (1.4 molecules/100 eV) for the production of H2(g) by alpha radiolysis by evaluating the effects on repository releases of using this single, higher-range value compared to a sampled range of values.	5/6/2020	Response Letter 7
CC2-GEOCHEM-16	Omission of RH Waste Gamma Irradiation from Radiolysis Evaluation. Please explain the omission of the potential effects of gas generation from gamma radiation from RH waste on performance assessment.	5/6/2020	Response Letter 7
CC2-MON-1a	Seismicity and seismic monitoring data - Please confirm which earthquake magnitude scale is being used to report seismic events found in Section 2.8 “Seismic Activity in the Delaware Basin” and the corresponding Table (e.g. Table 9 for the 2018 report) in the Delaware Basin Monitoring Annual Reports that are referenced in Appendix MON, and indirectly in Appendix SCR, CRA-2019 Section 42, etc.	5/6/2020	Response Letter 5 10/19/2020
CC2-MON-1b	**Seismicity and seismic monitoring data -** Please provide copies of the quarterly “A Report on the Seismicity of the WIPP Site from the New Mexico for the Period ___” by the New Mexico Institute of Mining and Technology (NMIMT) for 2017 and 2018 that are data sources for the Delaware Basin Monitoring program.	5/6/2020	Response Letter 5 10/19/2020
CC2-MON-1c	Seismicity and seismic monitoring data - What is the magnitude of completeness (Mc) of the WIPP seismic network catalog in the WIPP region currently, and what has it been in the past, from the initial site characterization phase and through the following decades? What methods were used to estimate Mc?	5/6/2020	Response Letter 5 10/19/2020

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CC3-GEN-3	Explain whether and why the DOE considers the CRA-2019 (deferred) PA to be a bonding analysis.	6/12/2020	Response Letter 6 10/26/2020
CC3-GEOCHEM-17a	Plutonium Particle sizes Used in Radiolytic Gas Gen Calcs - Indicate whether the SR-KAC-PuOx material originated at the same sites as the material in the Narlesky et al. (2012) study (Hanford, Rocky Flats, and Los Alamos National Laboratory).	6/12/2020	Response Letter 7
CC3-GEOCHEM-17b	Plutonium Particle sizes Used in Radiolytic Gas Gen Calcs -Identify the process or processes that produced the SR-KACPuOx (e.g., aqueous processing, metal oxidation, or other processes).	6/12/2020	Response Letter 7
CC3-GEOCHEM-17c	Plutonium Particle sizes Used in Radiolytic Gas Gen Calcs -Evaluate the effects of particle size reduction during the repackaging process on the SR-KAC-PuOx waste stream and other plutonium wastes in the WIPP inventory on radiolytic gas generation. In this evaluation, please assess the additional modeling uncertainty introduced as a result of a higher proportion of smaller particle sizes than the distribution Narlesky et al. (2012) has reported.	6/12/2020	Response Letter 7
CC3-GEOCHEM-17d	Plutonium Particle sizes Used in Radiolytic Gas Gen Calcs - Assess the uncertainty introduced into the particle size ranges and distributions and the radiolytic gas generation calculations by the presence in the WIPP inventory of plutonium wastes that were not included in the Narlesky et al. (2012) investigation, such as incinerator ash, contaminated soils, and plutonium contamination on waste materials surfaces.	6/12/2020	Response Letter 7
CC3-GEOCHEM-18	"Please provide a copy of the following reference cited by Day (2019): U.S. DOE. 2012. CH-TRU Payload Appendices, Rev. 3, December 2012. Carlsbad, NM. in Day, B. 2019. Reassessment of need and parameter justification for modeling gas generation due to radiolysis of brine and cellulose/plastic/rubber in WIPP for CRA-2019. Sandia National Laboratories, Carlsbad, New Mexico. ERMS 570873.	6/12/2020	Response Letter 5 10/19/2020
CC3-GEOCHEM-19	Support the assertion that matrix depletion will result in insignificant amounts of gas production by CPR radiolysis compared to other processes by providing additional calculations described in the following questions. There was more Pu per kilogram of waste in the Zerwekh (1979) study than that of the WIPP. This higher concentration may have resulted in in faster matrix depletion. In contrast, matrix depletion rates at WIPP may be slower, and gas generation values may potentially be underestimated. Furthermore, G-values from Zerwekh (1979) appear to asymptotically reach the value of 0.3 moles/100 eV, indicating a possible upper bound value for prediction of gas generation from CPR radiolysis.	6/12/2020	Response Letter 7

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC3-GEOCHEM-19a	Evaluate whether the much higher plutonium concentrations used by Zerwekh (1979) accelerated the experimentally observed matrix depletion in the experiments. Zerwekh (1979) used high Pu-238 concentrations (~20 Ci/kg) in an experimental investigation of radiolytic gas generation from organic materials. This concentration is significantly higher than the average Ci/kg in the WIPP waste material and packaging material inventory (USDOE 2018, Van Soest 2019). Additionally, please include an analysis of the effects on the predicted G values over time for CPR radiolysis if the effects of matrix depletion on G values for CPR in the WIPP repository are adjusted to be consistent with the much lower radionuclide concentrations in the inventory.	6/12/2020	Response Letter 7
CC3-GEOCHEM-19b	Provide a bounding analysis of the amount of gas generation from CPR radiolysis in the WIPP repository by assuming a constant G value of 0.3 moles/100 eV throughout the repository regulatory period. Zerwekh (1979) provided equations that were fitted to the gas generation data, and these equations were used by Day (2019) to project extremely low radiolytic gas generation rates after approximately 100 years (Day 2019, Figure 3). However, examination of the G values as a function of time indicates that the data may be asymptotically approaching a G value of approximately 0.3 molecules/100 eV at the end of the 4.9-year experiments (Zerwekh 1979, Figures 20 – 28).	6/12/2020	Response Letter 7
CC3-GEOCHEM-20	Evaluate whether radiolysis of adsorbed water on waste surfaces in humid areas of the WIPP repository could significantly affect the rates of radiolytic gas generation.	6/12/2020	Response Letter 7
CC3-GEOCHEM-21	Provide an analysis of the relative significance of radiolytic gas generation from other waste forms in the repository besides the CPR presented in Day (2019), including: 1) hydrated minerals, such as clays in waste soils; 2) solidified inorganic wastes; 3) solidified organic wastes; and 4) cements.	6/12/2020	Response Letter 7
CC3-HYDRO-1	Describe and provide a discussion of the “far field radionuclide transport questions” that may be answered by the Radiokrypton Analyses, whether they are answered and how they are incorporated into or influenced WIPP PA.	6/12/2020	Response Letter 5 10/19/2020
CC3-HYDRO-2	Provide a discussion of whether the pressure transducers are open to the atmosphere and, if not, how their readings are corrected to barometric pressure, as well as the locations of barometric pressure sensors.	6/12/2020	Response Letter 5 10/19/2020
CC3-HYDRO-3	Explain why it appears that monitoring wells SNL-1, SNL-2, SNL-3 SNL-19, WIPP-11 do not seem to be affected by the large precipitation events between 2013-2014 and after 2017 (Figure HYDRO-7). Furthermore, please explain why these same wells have relatively sharp increases in water-levels following what appear to be less significant rainfall events in early 2014 through early 2015 than those observed in 2017. Please explain how these results are consistent with statements in the text regarding seasonal effects and lateral transport.	6/12/2020	Response Letter 6 10/26/2020

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC3-HYDRO-4	It appears that only one well was identified that is impacting the water-levels in the Culebra. Please provide a description and results of activities undertaken to inventory other potential wells that may also be impacting the water-levels in the Culebra (e.g., location, water use, pumping rates and well construction) that could potentially impact water levels in the Culebra.	6/12/2020	Response Letter 7
CC3-HYDRO-5a	Provide a description of ongoing or future activities (e.g., well inventories, flow rate field measurements, modeling, continued monitoring, aquifer testing) that are or will be undertaken to better understand the underlying causes of the water level changes in the Culebra.	6/12/2020	Response Letter 5 10/19/2020
CC3-HYDRO-5b	Add precipitation rates to Figure HYDRO-15 (as was done on Figure HYDRO-7).	6/12/2020	Response Letter 5 10/19/2020
CC3-HYDRO-6	It is not clear to EPA whether PFLOTRAN has been qualified for use at WIPP. Please describe the QA requirements that were met by Thomas et. al. (2017) in their analyses (e.g., PFLOTRAN, transmissivity fields and particle tracking) provided in their PowerPoint presentation.	6/12/2020	Response Letter 5 10/19/2020
CC3-HYDRO-7	Provide a map of Bell Canyon injection/extraction wells associated with oil and gas production, injection/extraction volumes vs. time, and pressure vs. time measurements in Bell Canyon monitoring wells to enable conclusions to be drawn with respect to whether oil and gas production is responsible for the water level rise in the Bell Canyon, and if conclusive information is not available, a description of what more work would be required. Similarly, please explain why the oil and gas production north of the LWB has not impacted the waterlevels in DOE-2.	6/12/2020	Response Letter 7
CC3-SCR-1	Supplement the argument for screening out microbial colloidal transport in the Culebra (FEP N71) to 1) account for the ranges of sizes of indigenous microbes found in Culebra groundwater that are capable of transporting actinides as colloids, and 2) provide information supporting the assertion that those microbes would be rapidly filtered out.	6/12/2020	Response Letter 6 10/26/2020
CC3-SCR-2	Supplement the screening argument for FEPW22 Roof Falls with a discussion of the effects of roof falls on the modeling of open rooms in WIPP PA.	6/12/2020	Response Letter 6 10/26/2020
CC3-SCR-3	Update the screening argument for FEP W23 Subsidence 1) to be consistent with the current repository design; and 2) to explain and justify the difference in treatment in WIPP PA between subsidence due to repository excavations and subsidence due to potash mining.	6/12/2020	Response Letter 6 10/26/2020
CC3-SCR-4	Supplement the screening argument for FEP W28 Nuclear Explosions with an evaluation of the potential for nuclear explosions in the event of a roof fall if it occurred when only a single lift of waste containers was present in a disposal room instead of the customary three lifts. Alternatively, please provide a supplemental screening argument explaining why such a scenario would be screened out of consideration in WIPP PA	6/12/2020	Response Letter 6 10/26/2020
CC3-SCR-5a	Provide justification for the screening argument statement that the range of permeabilities assigned to the DRZ is sufficiently large that it accounts for an increase due to a potential seismic event as well as other sources of uncertainty.	6/12/2020	Response Letter 6 10/26/2020

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC3-SCR-5b	Supplement the screening argument with a discussion of the potential impact of a seismic event on triggering roof falls and whether this impact is accounted for in WIPP PA.	6/12/2020	Response Letter 6 10/26/2020
CC4-GEOCHEM-22	Appendix GEOCHEM Colloid Parameter Table - Inconsistencies in GEOCHEM Colloid Parameter Table	7/17/2020	Response Letter 7
CC4-MON-2	Updated Map of Potash Mining - Please provide a more recent, updated map of potash operations	7/17/2020	Response Letter 6 10/26/2020
CC4-MON-3	Status of Proposed New Potash Mine East of WIPP - Please provide status of proposed new potash mine east of WIPP	7/17/2020	Response Letter 6 10/26/2020
CC4-SCR-6	N FEPs Updates - Please update the natural FEPS with new information and confirm that screening decisions remain the same.	7/17/2020	Response Letter 7
CC4-SCR-6a	FEPs documentation is missing significant, relevant updates from the published literature for SCR-4.1.2 Tectonics: N3 Changes in Regional Stress, N4 Regional Tectonics, N5 Regional Uplift and Subsidence.	7/17/2020	Response Letter 7
CC4-SCR-6b	Please update discussions of karst-related FEPs (N18, 19, 21) and manmade dissolution features (i.e. sinkholes) (H34, H59) with relevant, recent information, including an EPA-mandated, DOE-funded, SNL study.	7/17/2020	Response Letter 7
CC4-SOTERM-6	Comparison of PROPMIC Values to Literature Values - Please use the biomass-based approach to compare the differences in mobilized actinides using the proposed updated CRA-2019 CAPMIC parameters and a recalculated CCA CAPMIC parameter as specifically identified below	7/17/2020	Response Letter 7
CC4-SOTERM-6a	Comparison of PROPMIC Values to Literature Values - Please recalculate the CCA CAPMIC parameter values using the 109 cells/ml proposed biomass-based approach that was used to calculate the CRA-2019 CAPMIC and PROPMIC values.	7/17/2020	Response Letter 7
CC4-SOTERM-6b	Comparison of PROPMIC Values to Literature Values - Using the CCA PROPMIC values as well as the recalculated CCA CAPMIC, please compare the effects on repository releases to that of the CRA-2019 microbial colloid enhancement parameters.	7/17/2020	Response Letter 7
CC4-SOTERM-7	Please confirm that Nishikava et al. (2018), cited in SOTERM-5.4.2, is the following reference: Nishikawa, S., T. Kobayashi and T. Sasaki. 2018. Solubilities and solubility products of thorium HYDROxide under moderate temperature conditions. Radiochimica Acta, 106:2017-2917.	7/17/2020	Response Letter 6 10/26/2020
CC4-SOTERM-8a	Pu(III) Intrinsic Colloid Concentrations - Please resolve the discrepancy between intrinsic colloid concentrations cited on page 23 and in Table A-1 of Reed et al. (2019).	7/17/2020	Response Letter 7
CC4-SOTERM-8b	Pu(III) Intrinsic Colloid Concentrations - Please assess the effects on repository releases due to a higher AM:CONCINT parameter as a result of the changes in the previous question.	7/17/2020	Response Letter 7
CC4-SOTERM-8c	Pu(III) Intrinsic Colloid Concentrations - Please explain the differences in some of the Pu(III) data presented by Reed et al. (2019), and data previously included in Reed et al. (2013)	7/17/2020	Response Letter 7
CC4-SOTERM-9	Intrinsic Colloid Concentrations Error - Please evaluate the effects on predicted repository releases as a result of increasing the TH:CONCINT, NP:CONCINT, PU:CONCINT, and U:CONCINT parameters to 3.08 × 10-6 M.	7/17/2020	Response Letter 7

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC4-SOTERM-10	Th(IV) Concentration Data Revisions. Please explain the differences between Th(IV) data presented for two samples by Reed et al. (2013 and 2019), and data presented by Borkowski (2012)	7/17/2020	Response Letter 7
CC4-SOTERM-11	Th(IV) Mineral Fragment Colloid Parameter - Please assess whether the mineral fragment colloid parameter for Th(IV) (TH:CONCMIN) should be increased from 2.6 × 10-8 M to an upper bounding value of 6.2 × 10-7 M.	7/17/2020	Response Letter 7
CC4-SOTERM-12	Actinide (IV)-Silica Colloids - Please evaluate and summarize in a writeup the possible importance of An(IV)-silicate colloids to mobilization of Th(IV), U(IV), and Pu(IV) in WIPP brines.	7/17/2020	Response Letter 6 10/26/2020
CC5-33-5a	Please provide a map showing the locations of boreholes used to calculate the plugging frequencies used in the CRA-2019 PA. On this same map please also show, at a minimum, the WIPP LWA boundary, the Delaware Basin boundary, the known Potash Leasing Area (KPLA) boundary, and the locations of boreholes within the Delaware Basin part of the KPLA that were granted exemptions from the New Mexico Oil Conservation Division (NMOCD) KPLA R-111-P plugging requirements	9/11/2020	Pending
CC5-33-5b	Please provide a list of boreholes within the KPLA that were given exemptions from the NMOCD KPLA R-111-P plugging requirements, the borehole locations, the type of plugging pattern used, and the reason for the exemption.	9/11/2020	Pending
CC5-33-5c	Please provide a map showing the locations of boreholes that would have been used to determine plugging pattern frequencies if the data collection and analysis methods used in the CRA-2014 PA had also been used in the CRA-2019 PA. On this same map please also show, at a minimum, the WIPP LWA boundary, the Delaware Basin boundary, the KPLA boundary, and the New Mexico – Texas state line.	9/11/2020	Pending
CC5-33-6	Is the area over which DOE is calculating plugging pattern probabilities limited to the 9 township area surrounding WIPP and within the KPLA and Delaware Basin, or is it the entire KPLA area within the Delaware Basin? What is currently being used, and why is there inconsistency in DOE's documentation [i.e., different versions of the Delaware Basin Monitoring Annual Report (DBMAR)]? This question may be answered in conjunction with CC5-33-5.	9/11/2020	Pending
CC5-33-7	Please explain the discrepancy between the number of plugged wells included in the first DBMAR 2018 report and DBMAR 2018 Rev. 1, i.e. why does Table 8 in the former include only 9 wells and Table 8 in the latter include 15 wells if they both list the same reporting period?	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-33-8	The total number of shallow boreholes drilled shows several examples of decreases from year to year as reported in the DBMAR. It appears that boreholes of unknown depth at the time of compilation of the annual monitoring report are being automatically counted as shallow boreholes (excluding them from PA), then are later sorted out into the correct categories as complete information is made available. This has the effect of decreasing the deep borehole drilling rate, or creating a lag in the input of what is a major driver of releases in PA. Please confirm whether this is correct and explain whether it is consistent with the principle of conservatism for unknown parameters. Also, please include an estimate of the length of time it typically takes for those boreholes of unknown depth to be updated with complete documentation and incorporated into their proper categories in the Delaware Basin Drilling Surveillance Program (DBDSP) database.	9/11/2020	Pending
CC5-GEOCHEM-23	Please provide copies of the PHREEQC input, output, and database (ymp_r2.dat) files used by Mariner (2019) to calculate the CRA-2019 DPA humic colloid parameters. Mariner, P.E. 2019. A summary of humic colloid parameter values to be implemented in the CRA-2019 Deferred Performance Assessment. Sandia National Laboratories, Carlsbad, New Mexico. ERMS 571250.	9/11/2020	Response Letter 7
CC5-GEOCHEM-24	Please provide additional GEOCHEMical calculations to evaluate the impacts of calcite precipitation on WIPP brine and actinide solubilities. Use the minimum brine volume (1x) of both GWB and ERDA-6 brines with the following scenarios: • With calcite precipitation suppressed; • With calcite precipitation until a calcite saturation index of 0.50 is achieved (if possible); • With calcite precipitation until a calcite saturation index of 0.25 is achieved; and • With calcite precipitation until a calcite saturation index of 0.0 is achieved. For these calculations: • Use anhydrite, halite, brucite, HYDROmagnesite5424, hibbingite, and cerussite as the initial starting minerals. • Allow the most stable Am(III), Th(IV) and Np(V) solid phases to precipitate to equilibrium, along with phase 5, glauberite, borax, whewellite, and syngenite if these phases become saturated. Please include input and output files, spreadsheets, and any other material used to perform these calculations.	9/11/2020	Pending
CC5-GEOCHEM-25	Please evaluate whether including polyhalite [K2Ca2Mg(SO4)4·2H2O(s)] in the initial Salado minerals in the actinide solubility calculations significantly affects the modeling results. In the EQ3/6 calculations, please assume that the Salado mineralogy is 90% halite, 7.5% anhydrite, and 2.5% polyhalite. **Please provide input and output files of all EQ3/6 calculations from this evaluation.**	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-GEOCHEM-26	Please evaluate whether including portlandite [Ca(OH)2(s)] in the actinide solubility calculations affects the predicted brine chemistry and actinide solubility modeling results. Please provide input and output files of all EQ3/6 calculations from this evaluation.	9/11/2020	Pending
CC5-GEOCHEM-27a	Please address the following questions regarding the parameter errors in the DATA0.FM4 database that were documented in Parameter Problem Reports 2019-004 through 2019-013 (Domski 2019a – 2019j): **Please provide the +III actinide solubilities in GWB and ERDA-6 brines that were calculated using the corrected Pitzer parameters for all five brine volumes used in PA.**	9/11/2020	Pending
CC5-GEOCHEM-27b	Please address the following questions regarding the parameter errors in the DATA0.FM4 database that were documented in Parameter Problem Reports 2019-004 through 2019-013 (Domski 2019a – 2019j): Please provide documentation describing the revised PA calculations performed to establish that the corrected +III actinide solubilities did not significantly affect PA results (Domski 2019a – 2019j). As part of this documentation, please include a copy of the following report: Domski, P.H. 2020. Correction of the α1 terms of three binary Pitzer parameter blocks in DATA0.FM4, PPR 2019-004 through 2019-013. Sandia National Laboratories, Carlsbad, New Mexico.	9/11/2020	Pending
CC5-GEOCHEM-27c	Please address the following questions regarding the parameter errors in the DATA0.FM4 database that were documented in Parameter Problem Reports 2019-004 through 2019-013 (Domski 2019a – 2019j): **Please provide a copy of Parameter Problem Report 2019-003, which is referenced in Domski (2019a – 2019j).**	9/11/2020	Pending
CC5-GEOCHEM-27d	Please address the following questions regarding the parameter errors in the DATA0.FM4 database that were documented in Parameter Problem Reports 2019-004 through 2019-013 (Domski 2019a – 2019j): **Please provide a copy of Parameter Problem Report 2019-003, which is referenced in Domski (2019a – 2019j).**	9/11/2020	Pending
CC5-HYDRO-8	Please explain whether the pressure response observed in SNL-13 during 2010-2012 is still thought to be due to oil and gas drilling in the general vicinity as was discussed in DOE's 2014 2nd Set of Responses to EPA comment 1-15-1, dated 12/17/2014. Please also explain why SNL-13 does not appear to be impacted by precipitation as are other wells located near Nash Draw.	9/11/2020	Pending
CC5-HYDRO-9	Please explain why the pressure response observed in H-09bR is decreasing prior to the private well being turned on, as shown in the figure below.	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-HYDRO-10	Please explain whether groundwater flow and radionuclide transport in the Culebra can still be conceptualized as dual porosity across the entire area of interest. The current conceptual model for the Culebra is one of dual porosity across the entire model domain. HYDROlogic studies in the last several years raise questions about the dual porosity conceptualization and suggests that dual permeability (or a combination of dual porosity and dual permeability) could be an alternative conceptualization. If dual permeability processes influence groundwater flow and radionuclide transport then groundwater flow velocities would be faster due to the very low effective porosities of discrete fractures, and both physical and chemical retardation of radionuclides would be much lower than currently assumed due to less diffusion into the matrix. Advective flow and transport within the matrix, as opposed to only diffusive transport as currently assumed, would also provide greater connectivity among fractures and accelerate radionuclide transport. These recent HYDROlogic studies are described below: (See EPA 5th Letter)	9/11/2020	Pending
CC5-HYDRO-11	Please describe the further investigations being conducted to determine the cause of the Magenta water level rise in eastern and central areas of the LWB. Please also explain why well H-15 is shown as a well screened within the Magenta in Figure HYDRO-17 and within the Culebra on Figure HYDRO-5	9/11/2020	Pending
CC5-MON-4a	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **DBMAR 2018 (both "Rev. 0" and Rev. 1) Summary Section (4.0) lists 157 wells spudded outside the nine-township area in New Mexico, but Section 2.5.2 in the same report lists 178. Similarly, the summary section of DBMAR 2017 lists 523 wells spudded in the Texas portion of the Delaware Basin, but Section 2.5.2 lists 546. And 2016 DBMAR Section 4 Summary lists 98 spudded wells outside the 9 township area in New Mexico, but Section 2.5.2 only lists 96. Please clarify.**	9/11/2020	Pending
CC5-MON-4b	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **DBMAR 2018 Section 2.1.1 lists 182 wells spudded in the New Mexico portion of the DWB in the first paragraph, but the next paragraph states that the 178 wells were drilled using rotary rigs. Are these referring to the same group of wells as the previous paragraph, or were not all drilled with rotary rigs, or is it a subset of wells that were spudded and drilled, not just spudded? Please explain.**	9/11/2020	Pending
CC5-MON-4c	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **DBMAR 2018 Section 2.9.1 describes injection wells in the 9 township area, but seemingly contradicts itself on numbers. It first mentions seven total injection wells, two injection wells owned by ConocoPhillips, and five OXY injection wells. But the next sentence states "the six wells are injecting into the Brushy Canyon Formation of the Delaware Basin." Should this actually be seven, or is a single well injecting water into a different interval not mentioned? The same statement is also made in DBMARs 2014 through 2017. Please clarify.**	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-MON-4d	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Apparent typo in DBMAR 2018, Table 7: Castile Brine Encounters. The well information for James Ranch Unit #63 (the fourth listed Castile Brine Encounter Since July 1995) reads that "35 ppm was reported but quickly dissipated to 3 ppm." Given the context, the correct unit is likely gpm (gallons per minute) not ppm (parts per million). The same apparent typographical error is also found in prior years of the DBMAR. Please confirm.**	9/11/2020	Pending
CC5-MON-4e	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **DBMAR 2018, Table 11 lists 10 active, 1 unknown, and 8 plugged brine wells for a total of 19, but adding the numbers in Tables 4 & 5 gives a number of 12 active and 7 plugged brine wells. Please explain.**	9/11/2020	Pending
CC5-MON-4f	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Shallow wells: zero wells reported under drilling or waiting on paperwork for Texas in 2017, but 3057 in New Mexico, and these numbers reverse for 2018 (3057 in TX and 0 in NM), and the numbers don't add up to the reported total of 3080 in 2018. Please explain.**	9/11/2020	Pending
CC5-MON-4g	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Shallow wells: the number of dry holes reported jumps from 2 to 10 and back to 1 from 2014, 2015, and 2016. A possible explanation could be some wells being repurposed as injection wells, brine wells, or junked and abandoned, but no corresponding increases under those categories can numerically account for the decreases. Please explain.**	9/11/2020	Pending
CC5-MON-4h	Shallow wells: the number of gas wells reported in Texas decreases from 8 to 2, up to 10 in 2015, then back to 1 in 2016. For New Mexico 9 gas wells were listed for 2011-13, but zero in the following years. Again, a possible explanation could be some wells being repurposed as injection wells, brine wells, plugged, or junked and abandoned, but no corresponding increases under these categories can fully account for the jumps in numbers. Please explain.	9/11/2020	Pending
CC5-MON-4i	Deep wells: the number of reported wells in the "oil and gas well" category for both TX and NM decrease between 2016 and 2017 (total of 309 to 290), then jump to higher numbers in 2018, but the decrease cannot be fully accounted for in the "plugged oil and gas well" category. Perhaps some wells were being repurposed as injection wells, brine wells, plugged, or junked and abandoned? Please explain.	9/11/2020	Pending
CC5-MON-4j	Deep wells: a large jump in the number of wells in the "Potash Core Hole" category from 23 to 111 between 2015 and 2016 seems anomalous compared to long term trends. This might be explained by activities related to the proposed new mine by Intercontinental Potash Corp mentioned in the DBMAR in 2015 and earlier years. Please confirm.	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-MON-4k	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Deep wells: the number of wells in the "other" category drops from 6 in previous years to zero in 2016 without a corresponding increase in other plausible categories. Please explain**	9/11/2020	Pending
CC5-MON-4l	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Deep wells: data table typo in DBMAR 2018. Table 5 gives the total number of gas wells as 2,394; the number should be 2,934, from summing the numbers listed for TX and NM. Please correct.**	9/11/2020	Pending
CC5-MON-4m	Explanation of inconsistencies/anomolies in DBMAR need explanation or correction. **Deep wells: DBMAR 2017, Table 5 lists eight brine wells in Texas and zero in New Mexico yet gives the total number of brine wells as nine. Please explain.**	9/11/2020	Pending
CC5-MON-5	What has been the yearly response rate (i.e., the total number of surveys sent out and the number of completed surveys received) of DBDSP annual surveys since 2010? These numbers were regularly reported in DBMAR up until 2010, but only twice in subsequent years. DBMAR 2013 gives these numbers as 13 and 3 for a response rate of 23%, but 2016 simply reports that survey responses were received without giving the number. The remaining years either make no mention of the survey being sent out, state that no survey was sent out, or mention that no surveys were returned. Please include all these numbers going forward.	9/11/2020	Pending
CC5-MON-6	DBMARs 2003-2010 mention finding BLM records for multiple shallow sulfur exploration holes in New Mexico, but these do not appear to have been added to the DBDSP database. What is the status of these wells and the database?	9/11/2020	Pending
CC5-SCR-7	Please address how calcium ions, HYDROxide ions, and isosaccharinic acid resulting from high pH effects of the cementitious materials in repository shaft seals may impact the solubilities of +III and +IV actinides. Please explain how DOE has accounted for these impacts in continuing to screen out FEPs W8 and W56 (i.e., the effects of high pH caused by cementitious materials in repository shaft seals on repository performance).	9/11/2020	Pending
CC5-SCR-8	Please indicate whether galvanic coupling between iron and lead in WIPP waste and packaging materials can continue to be screened out of WIPP PA despite the increased lead inventory in the CRA-2019 DPA. What are the effects of the reported galvanic corrosion of lead by iron oxides and HYDROxides on the screening argument for FEP W50 Galvanic Coupling (within the repository)?	9/11/2020	Pending

EPA Comment Number	EPA Request Description	EPA Letter of Request	Response Letter (submitted)
CC5-SCR-9	Please calculate the gas generated by lead corrosion under inundated conditions for time periods up to 10,000 years using a lead corrosion rate of 6.79 × 10-15 m/sec (see below), the mass of lead in the CRA-2019 DPA inventory (1.38 × 107 kg, Van Soest 2018), and the expected lead surface area per kg in the WIPP inventory and packaging materials. Please compare the results of these lead corrosion gas-generation calculations to equivalent calculations for inundated iron corrosion using the mean inundated steel corrosion rate, iron inventory, and iron surface area per kg used in the CRA-2019 DPA.	9/11/2020	Pending
CC5-SCR-10a	Please update the natural FEPS with newer information and confirm that screening decisions remain the same. **Natural gas intrusion (N32)**	9/11/2020	Pending
CC5-SCR-10b	Please update the natural FEPS with newer information and confirm that screening decisions remain the same. **Groundwater characteristics (N23, N24, N26, N27**)	9/11/2020	Pending
CC5-SCR-10c	Please update the natural FEPS with newer information and confirm that screening decisions remain the same. **Changes in groundwater (N35, N36, N37), recharge and discharge (N53, N54, N55)**	9/11/2020	Pending
CC5-TFILD-1	Please describe the decision criteria for determining whether the TFIELDs need to be recalculated to reflect more recent information.	9/11/2020	Pending